AFRICAN CSOs AND EXPERTS MEETING ON DDT

Co-organized by

AGENDA & PAN Africa

DAR ES SALAAM, TANZANIA   6 - 8 APRIL 2009
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AGENDA for Environment and Responsible Development (AGENDA)
& Pesticide Action Network (PAN) Africa

With support from

Marisla Foundation – Global Green-Grants Fund (USA)
International POPs Elimination Network (IPEN)
Pesticide Action Network (PAN) North America
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LIST OF ABBREVIATIONS AND ACRONYMS

ACT Artemisinin-Based Combination Therapy
AGENDA AGENDA for Environment and Responsible Development
AMREF African Medical and Research Foundation
CHAI Clintons HIV/AIDS Initiative
COP Committee of Parties
CPAM Community Pesticide Action Monitoring
CSO Community Service Organization
DDT Dichloro-Diphenyl-Trichloroethane
DSSA Demonstrating and Scaling-up of Sustainable Alternatives
ESZ Entomological Society of Zambia
EU European Union
EYAN Environmental Youth Action Network
GEF Global Environmental Facility
GFTAM Global Fund to Fight AIDS, Tuberculosis and Malaria
ICIPE International Centre of Insect Physiology and Ecology
IPTP Intermittent Preventive Treatment for Pregnant
ITN Insecticide Treated Nets
IRS Indoor Residue Spray
IVM Integrated Vector Management
JA! Justiça Ambiental
KEMRI Kenya Medical Research Institute
PSR Physicians for Social Responsibility
NEMA National Environmental Management Agency
NGO Non-Governmental Organization
NIP National Implementation Programme
NMCP National Malaria Control Programme
PAN Pesticide Action Network
PBK Pyrethrum Board of Kenya
PMI President’s Malaria Initiative
POPs Persistent Organic Pollutants
SRADev Sustainable Research & Action for Environmental Development
<table>
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<th>Acronym</th>
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<tr>
<td>TBC</td>
<td>Tanzania Broadcast Corporation</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environmental Programme</td>
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<td>UNETMAC</td>
<td>Uganda Network on Toxic Free Malaria Control</td>
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<td>WHO</td>
<td>World Health Organization</td>
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We would also like to thank Governments representatives from Ethiopia, Kenya and Uganda; UNEP/WHO/GEF DSSA Global Programme, Pyrethrum Board of Kenya, KEMRI and ICIPE; and all participants for sharing their experience to make the meeting a success.
1. INTRODUCTION

AGENDA for Environment and Responsible Development (AGENDA) in collaboration with the Pesticide Action Network (PAN) Africa organized an African CSOs and Expert Meeting on DDT use in malaria control programmes for indoor residual spraying (IRS) against available safer alternatives.

The meeting was called in realizing the fact that a number of initiatives have been undertaken to develop alternatives to DDT for disease vector control in some African countries, but they are done in isolation and there are no combined efforts to publicize and implement them on the ground. The meeting therefore brought together some of those who have been working on malaria and DDT including NGOs/CSOs, government representatives, intergovernmental organizations, researchers and academia, with the purpose of sharing information and experiences on current state of national malaria programs and DDT use, alternatives to DDT and international influences to national programmes, especially policies and funding issues, followed by crafting a way forward.

The meeting was able to come up with a regional programme towards safe and sustainable malaria control without reliance on DDT for IRS, a declaration and a Statement for COP4 “Towards malaria reduction without DDT”, which addresses a concern that DDT use has been on the increase worldwide since the Stockholm Convention, coupled with failure of these countries to use DDT according to guidelines set by the World Health Organization (WHO). The meeting took place at Mbezi Garden Hotel, Dar es Salaam, Tanzania from 6 to 8 April 2009.

2. OPENING THE MEETING

2.1. Welcome Remarks and Workshop Briefing

Executive Chairman of AGENDA, Prof. Jamidu Katima welcomed the participants to Tanzania and to the meeting and very briefly highlighted the aims of the meeting which, were to deliberate activities on DDT in Africa, to come out with something to
share with others as regard to DDT situation in Africa and to develop an agenda to pave way for dealing with DDT in Africa. He thereafter, requested all participants to briefly introduce themselves and their countries, organizations or departments they are representing. He wished all the participants fruitful discussions.

2.2. Opening Speech

In a very brief opening speech, the Regional Coordinator of the Pesticide Action Network (PAN) Africa Dr. Abou Thiam, emphasized on the rationale of the meeting as to bring together key stakeholders in the region for deliberating on what the DDT situation in Africa is, and encouraged the participants to develop a common strategy of action, which will constitute an input to the Fourth Conference of the Parties to The Stockholm Convention on POPs (COP4) to be held in Geneva, in early May 2009. With those few remarks he declared the meeting officially open, and wished the participants focused deliberations.

3. PAPER PRESENTATIONS

3.1. Keynote Paper

The general concept/keynote paper (Annex 5) was presented by Prof. Jamidu Katima from AGENDA (Tanzania). The paper points out some existing debates on DDT which shows overall that most of the figures presented on malaria deaths are unrealistically high and over-exaggerated, especially in Sub-Saharan Africa. The paper also highlights the fact that malaria increase in many countries may be due to a complex array of factors, rather than solely attributing it to reduced use of DDT. The paper analyzes the 2006 WHO position paper on global malaria programme and DDT, which shows various possible options for malaria interventions using IRS, in a logical sequence which shows that DDT IRS for malaria vector control should come as the last resort.

Shortcomings towards implementation of the Stockholm Convention in countries have been pointed out as the absence of stringent measures when applying DDT in many countries, inadequate research for safe, effective and affordable alternatives, uncertainties associated with DDT and its alternatives, and disproportionate funding on malaria interventions, mainly focusing on DDT use for IRS.
Challenges facing NGOs in campaigning against DDT use for malaria vector control in Africa includes lack of political will in some governments, poverty which limits affordability of non-DDT solutions to most local communities, adequacy of research capacity for non-DDT alternatives and inadequate information to convince the COP that non-DDT alternatives for malaria vector control offer a sustainable solution to the problem. The paper calls for importance of sharing information on country experiences in fighting DDT use in malaria vector control programs, alternatives to DDT, building on success stories and constraints, and to have a position statement for the COP4.

3.2. National papers on Malaria Control plans and DDT experience

Three papers presented by Ethiopia, Kenya and Uganda (Annex 5) revealed that Ethiopia and Uganda are using DDT after applying for exemptions from WHO to re-introduce DDT use for malaria vector control programmes, and it is still banned in Kenya. The goal of the Ethiopian government is to eliminate malaria by 2020 by employing such strategies as early malaria diagnosis and prompt treatment, selective vector control (IRS, ITNs), environmental control including abates, early detection and prompt containment of epidemics, supportive surveillance, health education and training. IRS has been implemented in Ethiopia for the past 45 years for malaria epidemic control, by 75% using DDT due to such reasons as cheap, effective and long lasting. Ethiopia demonstrated a well documented DDT IRS program which includes various techniques used, training of applicators, education/preparation of houses for spraying, and provision of safety materials and equipment.

Uganda has DDT IRS policy which was formed by consultation with various stakeholders including Sector Ministries, NEMA, Agro and Fish Export Community, International bodies, etc. The policy formulation also came as a result of scientific studies by local scientists, conducting comparative insecticide studies, literature review on DDT, consultation with other NMCP conducting DDT IRS in other countries. The programme was successfully implemented with high coverage, with more than 92% of targeted houses sprayed in all areas, high compliance and acceptance from the
community members, protecting more than 2 million people in 2 years. Other success stories include a rapid decline of malaria parastemia from 30% to 4%.

The Kenyan national malaria control program embraces non-DDT alternatives such as carbamates, organophosphates and pyrethroids in malaria vector control, which have brought about acceptable results, with so many success stories. DDT use is restricted, and can only be used as the last resort with emerging malaria epidemics, in accordance with the Stockholm Convention on POPs and WHO guidelines.

General challenges associated with DDT use in Ethiopia and Uganda include emerging vector resistance against DDT and alternatives, capacity (lack thereof) to monitor environmental fate and transport of DDT, the absence of information on alternatives to DDT, low awareness on environmental and human health effects of DDT, and failure to comply with WHO and Stockholm Convention guidelines during implementation of DDT IRS programs. In addition, general concerns on non-DDT vector control methods are pointed out as the viability, affordability (cost benefit analysis), acceptability, research capacity, data availability, potential environmental effects, and community awareness. Moreover, limitation to narrow coverage is also an important concern for non-DDT alternatives, coupled with lack of adequate funding for non-DDT alternatives, since very few agencies are interested in funding for non-DDT campaigns for malaria control.

3.2.1 Panel Discussion

After a lengthy Q/A session, a general consensus by the participants is that DDT is not as cheap as it is thought to be, if one considers the whole life cycle of the chemical. There is no need to scale up national malaria control programmes that embrace DDT for IRS currently practiced Ethiopia or Uganda to other countries in the region. The aim should be focusing on non-DDT alternatives, since they have proven to be working, from Kenyan experience. In addition, there is common understanding towards strengthening capacity for vector resistance monitoring, speed up research on non-DDT alternatives, and if need be, appropriately applying the Stockholm Convention and WHO guidelines on DDT IRS, promote experience sharing and use integrated vector management approach, with community involvement as one of the
major components. Questions still remain as to how all these approaches can be clustered have a common ground, how do we get commitments from governments; how to identify funding sources that are sustainable, including funding for procurement.

3.3. NGO Experiences on Country Malaria Control Programmes/ Plans

3.3.1 Physicians for Social Responsibility (PSR)-Kenya
There is an indication of a broad spectrum of NGO involvement in Kenya (Annex 5), including, among others, involvement of PSR-Kenya in establishing National Steering Committee of the Stockholm Convention and chairing Expert committee on DDT and Malaria, involvement in policy formulation, participation in expert debates on Kenyan DDT for malaria policy development, involvement of AMREF in research and capacity building projects.

3.3.2 PAN-Ethiopia
PAN Ethiopia conducted a study on assessment of pesticide use, practice and hazards in the Ethiopian Rift Valley (Annex 5) which showed that about 30% of the targeted population confirmed that they are using DDT for Agriculture. Elderly people drink diluted cup of DDT for “Malaria prevention”. Comparative study of impacts of cotton IPM in southern Ethiopia Rift Valley also showed that 30% of farmers use DDT for Agriculture pest control. As a consequence, DDT residues have been found in export coffee. Ethiopia also has a DDT formulation plant at the Ethiopian Rift Valley, whose discharges affect the Rift Valley bio-diversity. Problems associated with DDT in Ethiopia are attributed to misuse of DDT by farmers/sprayers, producers (Adami Tulu pesticide Plant) and retailers; lack of awareness/knowledge at all levels, availability (purchase cost & proximity) and inaccurate estimation of DDT required by Ministry of Health.

3.3.3 Environmental Youth Action Network (EYAN) - Ghana
In Ghana (Annex 5), EPA, which is the regulatory body in Ghana with the mandate to register pesticides for use in the country, approved four products for residual spraying purposes which are Bistar 10WP (Bifenthrin), Icon 10 CS (Lambda
cyhalothrin), Delet 2.5 EC 9 Deltamethrin and Vectorgaurd 40 WP (Pirimiphos methyl). These products have been tried and tested by the WHO and recommended for residual spraying against mosquitoes. Based on these results, EPA recommends that the Government of Ghana should resist any external pressures to re-introduce DDT into the country, since equally effective alternatives have been approved for use in the country.

3.3.4 Uganda Network on Toxic Free Malaria Control (UNETMAC) - Uganda
NGO Experience from Uganda (Annex 5) shows that National Environmental Agency (NEMA) okayed the use of DDT in December 2006. In April-May 2007, DDT spraying was done in the districts of Oyam and Apac. A court injunction on DDT spraying was granted in June-July 2007. NGOs observe major challenges faced on the use of DDT in Uganda, including limited public sensitization, limited training for the spray operators, lack of legal framework (still in draft), inadequate infrastructure (using school buildings as stores), limited financial resources (donor dependence), limited public acceptance, limited monitoring & evaluation. UNETMAC action has been to promote public awareness, distribution of ITNs, resistance on the use of toxic chemicals (DDT inclusive) and research on DDT alternatives.

3.3.5 Sustainable Research & Action for Environmental Development (SRADev) - Nigeria
The observation is that, not much has been carried out on DDT research. This is a potential issue of interest particularly as no known NGO in Nigeria is presently doing anything about DDT or has carried out specific activities beyond academic research. At best, SRADev (Annex 5) has only carried out sampling of DDT in breast milk among rural women in Abeokuta, Ogun state, written a few articles on the Nigeria media and newsletters in the past on DDT. E.g. DDT: WHO - Clean Bill of health?, Malaria is a scourge but DDT is not the cure and DDT conspiracy, Through the EDI participating on the UNEP/WHO human milk survey (Moms and POPs Project -MaPP) under the Stockholm Convention global Monitoring Plan in Nigeria. SRADev supports components to holistic approaches in fighting malaria such as epidemiological surveillance that allows early detection of malaria cases and prompt medical
treatment; community participation to improve home and water sanitation levels and eliminate mosquito larvae sites in streams and standing water; bed nets treated with insecticides other than DDT; and improved medical treatment and drugs. The challenge ahead is to provide many more nations with increased capacity to combat malaria and to assist those nations now using DDT to move toward the adoption of safer alternatives (Pesticide Action Network Updates Service, 2004). SRADev is willing to build capacity and actively involve in these issues and serve as the arrowhead in Nigeria.

3.3.6 AGENDA - Tanzania
The campaign by AGENDA (Annex 5) involves production of awareness materials on DDT, organizing meetings with relevant government institutions and individuals, media briefings, trainings on POPs health and environmental effects and existing alternatives (DDT included). AGENDA has been developing articles for mass media on DDT and other POPs, addressing the issue through various newspapers and holding press conferences at least twice every year (since 2005) during the commemoration of Africa Malaria Day (25th April) and World Environment Day. Mostly the information covered re-introduction of DDT and education on Malaria. In addition, AGENDA has held a series of radio and TV interviews on the National Radio, Tanzania Broadcasting Corporation (TBC-Taifa/PRT) in 15-minutes programmes, Urithi Wetu (our Heritage) part one on 1st April 2008 (DDT, our health and environment). Urithi Wetu (Our Heritage) part two was aired on 8th April 2008 and a TV interview on 2 May 2008. AGENDA also held interviews with newspaper in form of Q&A covered by The Guardian on 7th April 2008 and news article on Majira on 24th April 2008. AGENDA also conducted malaria survey to identify trends of malaria in the country. The survey indicates an urgent need to have a demonstration project in malaria prone areas that will include multiple environmentally safe strategies and involve community participation to manage mosquito densities and enhance control of malaria. The demonstration project will help the government to integrate and prioritise the strategies into the nation policy and also help other stakeholders to incorporate in their malaria control activities.
3.3.7 Justiça Ambiental (JA!) - Mozambique
In 2005, (JA! and civil society) received information stating that Mozambique was planning to re-introduce DDT for purposes of Malaria control. JA! did some research and generated substantial information on the impact of DDT to public health and existing non-DDT alternatives for malaria vector control. This information was sent together with a letter to the Ministry of Health, with no response from the government. Another local NGO organized a workshop about the DDT issue, with representative from the ministry and WHO invited. The workshop debate was quite lively; as most of the representatives of civil society (including JA!) were against the re-introduction of DDT. JA! gave interviews to media, newspaper and television, again raising the issue of egg testing to see if they were contaminated with DDT. In 2007 the Mozambique re-introduced DDT in Zambezia province and organized a workshop to inform the community about this introduction.

3.3.8 Entomological Society of Zambia (ESZ) - Zambia
DDT was banned in Zambia in 1980s for many reasons already mentioned, but was re-introduced in year 2000 and its use scaled up for malaria vector control. Bed nets are also used for pregnant mothers and children under 5. As an NGO, ESZ has been looking on issues such as monitoring and evaluation, how to convince the civil society that non-DDT alternatives are safe. Currently ESZ is conducting a study on the fate of DDT used in IRS. A machine known as RESIN CATCHER is used for air sampling in sprayed houses at various times after spray to see how long DDT persists in the air after spray. The study is still on-going.

3.3.9 Indaloyethu Environmental Cooperative - South Africa
South Africa remains committed to its DDT-based “Roll-back Malaria” program in all areas including the Limpopo province where the only vector is Anopheles arabiensis can be controlled effectively by pyrethroids (Annex 5). Department of Health is responsible for the Indoor Residual Spraying programme with good management of DDT inventories and containers. Department of Environment and Tourism is responsible for the Stockholm Convention National Implementation Plan (NIP) However, the SA government has not effectively implemented many of its NIP
commitments. The absence of a NIP DDT action plan has resulted into lack of information on the actual DDT usage in the country, although industry sources suggest that the actual DDT usage is in the order of 33 tons per year. In 2007 South Africa had a DDT stockpile of 274 tons. Evidence shows that the levels of the DDT metabolite, DDE, in the bodies of residents of DDT sprayed houses in the Limpopo province was 216.5 mg/kg.

Major concerns on the usage of DDT in South Africa come from results generated in recent studies which show serious congenital birth defects of children from houses sprayed with DDT, only mud huts are sprayed with DDT, i.e. the poorest of the poor, householders are not warned of the dangers of DDT, DDT used unnecessarily in the Limpopo province where there is no resistance to pyrethroids, and the lack of focus on the development of alternatives such as lippea javanica deterrent and Bt as a vector control, there is a threat from low level contamination of pollen and crop residues from Genetically Modified Bt crops engineered to release Bt toxins on the efficacy of natural Bt vector control. No evidence to show that Anopheles phenestus has not once again been eradicated as it was when the DDT indoor residual spraying programme was first introduced more than thirty years ago.

### 3.4. Experiences with alternatives to DDT

#### 3.4.1 Pyrethrum Board of Kenya

A paper titled “Pyrethrum as an alternative to DDT in public health: a case for use of pyrethrum products in IRS and as larvicide against malaria vectors” (Annex 5) was presented by Pyrethrum Board of Kenya (PBK). The paper provides an insight on the results from a study conducted to determine the effect of PYMOS IRS on the prevalence of malaria prevalence vectors, to determine in-house residual efficacy of PYMOS in the sprayed houses and to determine the relative acceptability and perception of PYMOS by the user community. As a conclusion, the study was able to establish that pyrethrum products have good bio-efficacy against mosquitoes, are safe and available for use, they are suitable for integrated vector management through IRS and source reduction, and recommend that the products be given serious consideration as local solution to DDT in the fight against malaria.
3.4.2 UNEP

Presentation titled “Demonstrating and Scaling-up of Sustainable Alternatives to DDT in Vector Management (DSSA - Global Programme)” (Annex 5) mentioned the objectives of the DSSA-Global Programme as the protection of human health and the environment through the reduction of emission of DDT into the global environment by decreasing the use of DDT through introduction, demonstration and scaling-up of sustainable alternatives to DDT in disease vector management. The paper highlights an important point that “The use of DDT for malaria control in the WHO Africa Region the year before signing of the Convention (2000) was less than 2 years after the Convention entered into force (2006)”. Reasons for the increase includes fast expansion of vector control programs with Indoor Residual Spraying (IRS), both at country and at regional levels, followed by inappropriate IVM capacity building on technical expertise for policy making and planning. Other reasons for the increase include lack of sound entomological surveillance systems to predict when and where DDT should be used and when and where not, several countries still spraying DDT indiscriminate in the open air rather than targeted through IRS, and countries and aid donors seeking to return to DDT spraying as Indoor Residual Spraying (IRS) as a cheap and quick way of cutting malaria incidence.

The paper recommends a global strategy (Business Plan) be put in place to trigger significant action and to develop/deploy alternative approaches to DDT; countries receive funding and technical support to develop their capacities to implement IVM; regional ‘alternatives to DDT Projects’ demonstrating cost-effectiveness of alternatives to DDT be implemented quickly. Addition, the paper described a Demo Project: Malaria control in Mexico and Central America in the context of elimination of DDT use. In addition, the paper showed a range of projects undertaken under the DSSA - UNEP/WHO/GEF worldwide, identifying the anticipated funding and co-funding sources.
3.4.3 KEMRI/ICIPE Malaria Program, Ministry of Health and Municipal Council of Malindi

A paper titled “Integrated Vector Management for Malaria control in Malindi, Kenya” was presented (Annex 5) describes a project that aimed at improving human health through integrated vector management in Malindi. Actions outlined to achieve the objective were community empowerment in malaria and mosquito through participative and applicable training in respective techniques and decision making, establishing and implementing a distribution plan for bed nets to increase the bed net coverage to more than 80% and enhancing sustainability of the intervention.

Results from this study revealed the following:

- Scaling up interventions (ITNs, EM, Larval control) reduced malaria morbidity in under 5 children and adults (88 deaths prevented per year in the next 3 years).
- Bed net coverage increased from 15% in 2005 to over 60% in 2008.
- Enhanced community participation and built capacity at both community and at the household levels with the ability to generate and analyse entomological information for vector control interventions.
- There was significant reduction in anopheline abundance as well as the control of nuisance-biting species. This fostered community support and satisfaction.

According to this study, the challenge for the future is to develop additional effective tools for vector control and combine them logically, so that operational vector control can go beyond bed-nets and beyond DDT, strengthening of basic vector surveillance capacities at the level of the District and national malaria control programs, involvement of District networks for harmonization and coordination of malaria control with other stakeholders, maintaining and sustaining the gains over time will be challenging, if the required technical skills and capacities are not quickly established at all levels and limited infrastructures, human resources, and lack of the technical skills to generate and analyse entomological information for selecting, planning, monitoring and evaluating vector control interventions.
3.4.4 Discussion and way forward

Question: What alternatives to DDT are successful and should be highlighted?

Response from participants:
1. Breaking the life cycle of mosquitoes by highlighting and changing breeding localities by using insectivorous fish and larvae. That could be an important area of intervention
2. For adult mosquitoes, we need to increase the distribution of nets and plant mosquito repellants around residences to limit the chances of mosquitoes going into the houses

Question: What direction are African Malaria Control programs heading and why?

Response from participants:
The programs are heading towards using hard chemicals such as DDT that will ultimately damage our environment while resources to clean the environment are limited, solely attributed to lack of commitment of governments into promoting development of effective malaria control programmes without DDT.

3.5. International Influences to National Programmes: Policies and Funding

3.5.1 Global Foundations and Initiatives
Papers under this category look on how international policies and major malaria control programmes affect malaria control in Africa (Annex 5). The Global Fund to Fight Aids, Tuberculosis and Malaria (GFTAM) approved 94 new grants round 8 worth USD 2.75 Billion over 2 years, with an overall portfolio now totaling USD 14.4 Billion in 140 countries. GFTAM receives contributions from the EU and UN along with national governments, civil society and private sector. Multilateral funding agencies such as World Bank and WHO, foundations like Clinton’s HIV/Aids Initiative (CHAI), provide the necessary technical and financial assistance to malaria programmes. Bilateral aid negotiated agreements between countries, e.g. DFID commitment to fight against malaria. Malaria funding ranked second to HIV/Aids globally in 2007. However, the majority of funding so far has focused on drugs, followed by basic research and preventive vaccine. Vector control products amounted in 3.6% of total malaria fund, which is a major drawback. In addition, the funding process of GFTAM is
complicated and bureaucratic. Funding for non-DDT alternatives for malaria vector control is very limited, with only one project involving Madagascar, Ethiopia and Eritrea, being funded by GEF. GFTAM funding policy has not incorporated Stockholm Convention. Global economic crisis also resulted into USD 3 Billion shortfall for the GFTAM. Overall, there is an indication of good progress on funding levels for malaria control in declining malaria mortality and morbidity in Kenya, Malawi, Rwanda and Zanzibar.

A study by PAN-Germany on non-compliance by countries and financiers/players of malaria control programmes to Stockholm Convention shows that 14 countries are on the edge of non-compliance to Stockholm Convention regarding DDT use, 10 countries implemented the elimination of DDT, 6 countries used DDT illegally as the registration happened too late, 5 countries used DDT illegally as they used it without informing the Stockholm Convention.

3.5.2 Country Policies on DDT-Germany
The Germany government policy on DDT emphasizes eliminating obsolete DDT stockpiles, generation of information and knowledge on alternatives, new insecticides, development and implementation of Integrated Vector Management approaches without DDT. PAN Germany calls for strong focus on non-chemical approaches on DDT.

3.5.3 Country Policies on DDT-USA
The US President’s Malaria Initiative (PMI) launched in 2005 under USAID, committed 5 billion dollars funding over 5 year since 2008 with a goal to reduce malaria related deaths by 50% in 15 focus countries. Malaria control interventions being promoted by PMI are ITNs, IRS with WHO-approved insecticides including DDT, intermittent preventive treatment for pregnant women (IPTP) and artemisinin-based combination therapy (ACT). PMI works in close collaboration with international and in-country partners, through strengthening national malaria control programs, build capacity for country ownership of malaria control efforts, strengthening health systems, maternal and child health services and an integrated package of preventive and treatment interventions.
4. WORKING GROUPS

4.1. Task 1: Identification and highlighting common obstacles, needs and strategies for African NGOs in the campaign of effective malaria control without DDT

Participants were organized into three (3) Working Groups (WGs) to work on a matrix to identify and highlight common obstacles, needs and strategies for African NGOs in their role for effective malaria control without DDT (See Annex 6). Reports from group presentations identified major obstacles as:

National level

• Lack of information, inadequate funding, lack of political will for some governments to work with NGOs or support NGO activities, negative perception by governments as trouble makers,
• Lack of Collaboration and co-ordination between and among NGOs, between NGOs and Research Institutions; competition between NGOs,
• Inadequate human capacity with the necessary expertise to deal with malaria and DDT, proposal writing and advocacy skills.
• Inadequate institutional capacity to execute various project including malaria and DDT.

Regional level

At regional level, the main obstacles identified were:

• Lack of sufficient information on alternatives
• Lack of adequate success stories on alternatives
• Absence of the full cost benefit analysis for DDT and alternatives, and
• Marginalized position of NGOs with regard to Stockholm Convention.

Needs assessment for NGOs revealed such areas of critical need as:

National level

• Improved access to adequate and relevant information on DDT and Malaria
• Research and dissemination on DDT and alternatives
• Increased involvement of grassroots community in DDT campaigns
• Increased Government recognition of NGO activities and enhanced NGO influence on government decision making process, and
• The need for cooperation with government agencies in implementation of programs on chemicals
• Funds to carry out trainings and build institutional capacity
• Harmony and coordination among NGOs in their work, (e.g. DDT forum)
• Collaboration with research institute/universities
• Developing a database of expertise on DDT/related chemicals
• Human capacity development of NGOs at all levels on proposal writing, advocacy and negotiation, lobbying skills etc.

Regional level
• For NGOs to participate in demonstration of non-DDT alternatives,
• Sharing information about successful stories
• Promoting trans-boundary information exchange
• Empowerment on how to use Community Pesticide Action Monitoring (CPAM)
• To be involved in developing full cost-benefit analysis of DDT and alternatives
• Monitoring and evaluation
• Involvement of NGOs in implementation Stockholm Convention at different levels
• Integration of NGOs in the national and regional implementation programmes and have influence on regional interventions

Strategies developed through WG deliberations included the following:

National level
• Creating awareness on safe DDT use,
• Conducting meetings, seminars, conferences, etc to review communication strategies on malaria control and DDT issues
• Training and engaging the media for community outreach,
• Promoting wider reach through publications and lobbying the governments and relevant authorities to recognize the role of NGOs in DDT campaigns and embrace DDT alternatives
• Building a core fundraising group amongst the NGOs
• Identifying training needs for NGOs on advocacy skills, lobbying techniques, proposal writing and fundraising skills including identification of donor agencies
• Building capacity among NGOs on technical expertise on DDT.

Regional level:
Regionally, NGOs agreed on the strategy to promote exchange of ideas and sharing experiences for example visiting countries which that have successfully effected non-DDT alternatives malaria control and harmonize CPAM activities at national levels.

4.2. Task 2: Highlight on the contents of the Programme (What, When, How, Who?)

4.2.1 WG themes
The three WGs started working on development of Regional Programme (Annex 7) which outlines time frame (when?) for activities(what?), mode of execution (how?) and assign responsibilities (who?) for follow up. Output from group work classified actions into short term and medium term.

4.2.2 Short term actions
Short term actions developed in the programme include:
• Allocating the NIP funds to CSOs & updating the NIP,
• Training and involvement of local experts and CS groups in NIP preparation and update
• Capacity building for the NGOs in countries using and intending to use DDT
• Giving attention to non-compliant countries
• Embarking on full cost benefit analysis & life cycle assessment of DDT and alternatives
• Establishment of National NGOs Committee on implementation of Stockholm Convention (DDT) (to complement the existing designated Focal Points)
• Establishing an interim regional hub (See Annex 8). As a matter of follow up, responsibilities were assigned to NGOs according to experience. PSR-Kenya was unanimously appointed as the interim regional hub. Country focal points were also established and will have a responsibility of coordinating other NGOs in respective countries towards forming permanent National Committees. These are UNETMAC (Uganda), iLIMA-Kenya (Kenya), AGENDA (Tanzania), PAN ETHIOPIA (Ethiopia), Entomological Society of Zambia (Zambia), Justica Ambiental (JA!) (Mozambique), EYAN (Ghana), SRADev (Nigeria) and Indaloyethu Environmental Cooperative (South Africa).

4.2.3 Medium term actions (5 years from 2009-2014)
• Developing a project for capacity building for Civil Societies of countries using or intending to use DDT to support the correct implementation of the Stockholm Convention and alternatives to DDT in Vector Control
• Lobbying governments and relevant authorities to embrace DDT alternatives and recognize the role of NGOs in DDT campaigns
• Continue to promote awareness on adverse impact of DDT use amongst all stakeholders
• Developing communication strategy among NGOs at all levels
• Harmonizing CPAM activities at national and regional levels and
• Establishing timeframe for final phasing out of DDT.

The contents from WG task 1 and 2 were then used to develop a position statement from this meeting for COP4 and ICCM2 (Annex 3) and the Dar es Salaam declaration (Annex 4).

5. CLOSING

The AGENDA Executive Chairman, Prof. Jamidu Katima expressed his appreciation to all participants who committed themselves to attain the meeting objectives. He requested that the spirit continue, and commit their time whenever needed in order to
attain successful campaign against use of DDT in Africa and the world at large. He informed the participants that the meeting declaration and statement will be presented at the forthcoming COP4 in Geneva (May, 2009). He wished all participants safe return back to their home countries and officially declared the meeting closed.
**ANNEXES**

**ANNEX 1: WORKSHOP PROGRAM**

**DAY 1: Monday, 6th April 2009**

*Goal: Experience sharing on malaria control programs and alternatives to DDT*

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>08.00 - 08.30</td>
<td>Registration</td>
<td>All</td>
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<tr>
<td>08.30 – 09.15</td>
<td>Welcome Remarks</td>
<td>Prof. Jamidu Katima</td>
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<tr>
<td>09.15 – 09.30</td>
<td>Self Introduction of Participants and their expectations from the meeting</td>
<td>All</td>
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<tr>
<td>09.30 - 09.45</td>
<td>Opening Remarks by Guest of Honor Stockholm Conv. Focal Point - Tanzania</td>
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<tr>
<td>09.45 – 10.00</td>
<td>Group Photo and Press Conference</td>
<td>Guest of Honor</td>
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**10.00 – 10.30**  **Health Break**

**National Malaria Program Overview and Experiences - Current state of National Malaria Programs**

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>10.30 – 11.00</td>
<td>General concept / key note paper* (1)</td>
<td>Prof. Jamidu Katima</td>
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<tr>
<td>11.00 – 12.15</td>
<td>Panel discussion: Malaria Control Plans and DDT Experience (2)</td>
<td>MoH (Ethiopia, Kenya, Tanzania, Uganda and Zambia)</td>
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<tr>
<td>12.15 – 13.00</td>
<td>NGO Experiences on Country Malaria Control Programs/ Plans (3)</td>
<td>Ethiopia, Ghana, Kenya, Mozambique, Nigeria, South Africa, Tanzania, Uganda, Zambia</td>
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<tr>
<td>13.00 – 14.00</td>
<td>Lunch Break</td>
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**Alternatives to DDT - Experiences with alternatives to DDT**

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<th>Time</th>
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<tr>
<td>14.00 – 14.30</td>
<td>Pyrethrum as an Alternative to DDT in Public health: A case for use of pyrethrum products in IRS and as larvicide against malaria vectors (4)</td>
<td>Mr. Kefa Sum Pyrethrum Board of Kenya</td>
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### DAY 1: Monday, 6th April 2009

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<tr>
<td>14.30 – 15.00</td>
<td>UNEP/GEF/WHO Global DDT Alternatives Project (5)</td>
<td>Mr. Jan Betlem - UNEP</td>
</tr>
<tr>
<td>15.00 – 15.30</td>
<td>Available Alternatives to DDT: Experiences from ICIPE and Bio-Vision (6)</td>
<td>ICIPE and Bio Vision</td>
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<tr>
<td>15.30 – 16.00</td>
<td>Discussion of presentations (4-6): - What alternatives to DDT are successful and should be highlighted? - What direction are African Malaria Control program heading and why?</td>
<td>All</td>
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<tr>
<td>16.00 – 16.15</td>
<td><strong>Health Break</strong></td>
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**International Influences to National Programs: Policies and Funding**

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<tr>
<td>16.15 – 16.45</td>
<td>Global Policy and Funding for DDT - How are international Policies and major malaria program funding affecting effective malaria control in Africa? (7)</td>
<td>Dr. Paul Saoke</td>
</tr>
<tr>
<td>16.45 -17.30</td>
<td>Panel Discussions: Global policy &amp; Development Agenda - How is the Development Agenda Affecting Malaria Control Programs in Africa (8)</td>
<td>Dr. Abou Thiam, Dr. Carina Weber and Dr. Paul Saoke</td>
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<td>17.30</td>
<td>End of Day 1</td>
<td>All</td>
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**DAY 2: Tuesday, 7th April 2009**

**Goal: Setting NGOs/CSOs strategies towards effective malaria control in Africa without DDT**

**Planning a Regional Program**

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<td>08.00 - 08.30</td>
<td>Registration</td>
<td>All</td>
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<tr>
<td>08.30 – 09.00</td>
<td>Recap of Day 1</td>
<td>Facilitator/Moderator</td>
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<tr>
<td>09.00-09.15</td>
<td>Introduction of Working Groups (WG)</td>
<td>Facilitator/Moderator</td>
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<tr>
<td>09.15 – 11.00</td>
<td>WG on Matrix: Identify and highlight common obstacles, needs and strategies for African NGOs – National and Regional (9)</td>
<td>All</td>
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<tr>
<td>11.00 – 11.15</td>
<td><strong>Health Break</strong></td>
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<tr>
<td>11.15 - 13.00</td>
<td>WG report back</td>
<td>All</td>
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<td>13.00 – 14.00</td>
<td>Lunch Break</td>
<td>All</td>
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<tr>
<td>14.00 – 14.15</td>
<td>Introducing contents of the Regional Programme (What, when, how, who?)</td>
<td>Facilitator/Moderator</td>
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<tr>
<td>14.15 – 16.00</td>
<td>WG – Regional Program</td>
<td>All</td>
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<tr>
<td>16.00 – 16.15</td>
<td>Health Break</td>
<td>All</td>
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<tr>
<td>16.15 – 17.30</td>
<td>WG Regional Program (cont)</td>
<td>All</td>
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<td>17.30</td>
<td>End of day 2</td>
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**DAY 3: Wednesday, 8th April 2009**

*Goal: Proposing a regional programme on malaria control and future collaboration*

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<th>Time</th>
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<tr>
<td></td>
<td>Report back from Groups and Drafting the Regional Program</td>
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<tr>
<td>08.00 - 08.30</td>
<td>Registration</td>
<td>All</td>
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<tr>
<td>08.30 – 09.00</td>
<td>Recap of Day 2</td>
<td>Facilitator/Moderator</td>
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<tr>
<td>09.00 – 10.30</td>
<td>Report back from WGs on Regional Program</td>
<td>Groups Reps</td>
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<td>10.30 - 10.45</td>
<td>Health Break</td>
<td>All</td>
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<tr>
<td>10.45 – 12.00</td>
<td>Discussion and drawing contents and draft Regional Program</td>
<td>Facilitator/Moderator</td>
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<tr>
<td>12.00 – 13.00</td>
<td>Working on the Program Contents</td>
<td>Facilitator/Moderator</td>
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<td>13.00 – 14.00</td>
<td>Lunch Break</td>
<td>All</td>
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<td>14.00 – 15.00</td>
<td>Formation of Regional Network and Lead Team to carry the draft programme forward</td>
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<tr>
<td>15.00 – 15.30</td>
<td>Way Forward and closing remarks - Completion of the Reg. program - COP 4 interventions - Country interventions - Closing</td>
<td>Dr. Abou Thiam and Prof. Jamidu Katima</td>
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<tr>
<td>15.30 – 16.00</td>
<td>Press Conference</td>
<td>Prof. Jamidu Katima and Dr. Abou Thiam</td>
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<td>16.00</td>
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<tr>
<td>1.</td>
<td>Mr. Robert B. Tumwesigye</td>
<td>PROBICOU</td>
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<td>2.</td>
<td>Dr. Abou Thiam</td>
<td>PAN Africa</td>
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<td>3.</td>
<td>Mr. Griffins Ochieng</td>
<td>iLima Kenya</td>
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<td>4.</td>
<td>Dr. Kiambo Njagi</td>
<td>Division of Malaria Control</td>
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<td>DOMC/MPHS</td>
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<td>5.</td>
<td>Mr. Kefa Sum</td>
<td>Pyrethrum Board of Kenya</td>
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<td>6.</td>
<td>Ms. Betty Obbo</td>
<td>National Association of</td>
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<td>Professional Environmental</td>
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<td>ists (NAPE)</td>
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<td>7.</td>
<td>Mr. Seife Bashaye</td>
<td>Vector Control -Federal</td>
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<td>Ministry of Health</td>
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<td>8.</td>
<td>Mr. Jan Betlem</td>
<td>UNEP Division of GEF</td>
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<td>Coordination</td>
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<td>9.</td>
<td>Mr. Tadesse Amera</td>
<td>PAN - Ethiopia</td>
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<td>10.</td>
<td>Ms. Carina Weber</td>
<td>PAN Germany</td>
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<td>11.</td>
<td>Mr. Eugene Itua</td>
<td>SRADev</td>
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<td>12</td>
<td>Mr. Ellady Muyambi</td>
<td>Uganda Network on Toxic Free Malaria Control (UNETMAC)</td>
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<tr>
<td>13</td>
<td>Mr. Arsenio Banze</td>
<td>Justica Ambiental (JA!)</td>
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<td>14</td>
<td>Mr. Osei Akoto</td>
<td>Kwame Nkrumah University of Science and Technology - EYAN</td>
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<td>15</td>
<td>Mr. Samuel Kahindi</td>
<td>ICIPE - Kenya</td>
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<td>16</td>
<td>Dr. Paul Saoke</td>
<td>PSR-Kenya</td>
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<td>17</td>
<td>Mr. Crispin K. Kaposki</td>
<td>PAN Zambia / Entomological Society of Zambia</td>
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<td>18</td>
<td>Dr. Myres Lugemwa</td>
<td>Malaria Control Programme (MCP), Ministry of Health (MOH)</td>
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<td>19</td>
<td>Prof. J.H. Katima</td>
<td>AGENDA</td>
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<td>20</td>
<td>Dr. Vera Ngowi</td>
<td>Muhimbili University of Health and Allied Sciences (MUHAS)</td>
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<td>21</td>
<td>Mr. A. Mwakatole</td>
<td>ENVIROCARE</td>
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<td>22</td>
<td>Mr. Silvani Mng'anya</td>
<td>AGENDA</td>
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<td>23.</td>
<td>Mr. Haji Rehan</td>
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<td>24.</td>
<td>Mr. Jamal Kiama</td>
<td>AGENDA</td>
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<td>25.</td>
<td>Ms Cecilia Mwakasege</td>
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<td>26.</td>
<td>Ms. Judica Losai</td>
<td>JET</td>
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<td>27.</td>
<td>Mr. Mark Wells</td>
<td>TWIG</td>
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<td>28.</td>
<td>Mr. Yahya Msangi</td>
<td>IUF/TAPOHE</td>
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<td>29.</td>
<td>Dr. William Mwegoha</td>
<td>Ardhi Univerity (ARU)</td>
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ANNEX 3: DAR-ES-SALAAM DECLARATION ON ALTERNATIVE APPROACHES TO DDT USE FOR VECTOR CONTROL – 8TH APRIL 2009

**Acknowledging** that malaria is a global crisis, which needs immediate attention and dedication by the global community to roll it back and that public health programmes and poverty reduction need broad-based sustainable/long-term strategies to address malaria as well as other diseases that are preventable and curable with sufficient resources;

**Aware** that DDT is a persistent organic pollutant, which is a bio-accumulative pesticide, that causes reproductive health and neuro-developmental disorders, pregnancy wastages and shortened lactation in breast feeding mothers; whose use is to be eliminated under the Stockholm Convention;

**Understanding** that many Parties to the Convention facing the enormous burden of malaria have requested for exemption to use DDT for malaria control in the short term and that they are bound to observe the conditions as set out in Annex B, Part II of the Stockholm Convention;
**Appreciating** the efforts of the global community and their commitment to fight malaria through the Global Fund to fight AIDS, Tuberculosis and Malaria, and the Conference of Parties 3 decision to prepare a business plan to develop and deploy alternative methods, strategies and products to combat malaria as well as the initiative to establish a global partnership to develop alternatives to DDT;

**Worried** that the use of DDT has escalated threefold since the signing of the Convention in 2001 and that many more countries are planning to re-introduce DDT while the Convention demands that Parties reduce reliance on DDT for vector control and work towards eventual elimination;

**Seriously concerned** that the use of DDT for IRS is being conducted without strict observance of the WHO guidelines and disposal of DDT in accordance with the Basel Convention guidelines and Stockholm Convention BATs/BEPs and, that strategies for monitoring and evaluation are not built into spraying programs;

**Noting** that the goal of the Stockholm Convention is to “protect human health and the environment”, however there is emerging new evidence of environmental and health effects of DDT in newborn children and in male reproductive health disorders due to DDT used in IRS;

**Mindful** of the global economic crunch that threatens funding for malaria control programs development and deployment of alternatives and that there is a general reluctance by Parties in Africa to embrace and fund alternatives;

**Comforted** by the results of the UNEP/GEF/WHO project on *Demonstrating and Scaling-up of Sustainable Alternatives to DDT in Vector Management (DSSA - Global Programme)* in Latin America indicating that malaria can be controlled without the use of toxic chemicals, and that similar projects have been initiated in other continents including Africa;

**Now Therefore**

*We*, representatives of the NGO community in Africa, driven by our desire to address the health and environmental problems that affect poor communities especially in the developing countries and countries with economies in transition commit ourselves to;

**Create awareness** on adverse effects of DDT use, organize meetings, seminars, conferences, etc to review communication strategies on DDT issues and train the media for information dissemination while promoting publications by providing information, education and training to decision makers, health care workers, and the community focusing on the health impacts and non chemical alternatives;

**Lobby** Governments to recognize the role of NGOs in DDT campaigns and relevant government authorities to embrace DDT alternatives and subsequently work with
national governments and relevant stakeholders to comply with article 7 of the Stockholm Convention;

**Build** a core fund raising group amongst the NGOs and develop proposals (with emphasis on coordinated initiative and capacity building and fundraising skills) and identify donors to fund them;

**Identify** training needs for NGOs including training on advocacy, negotiations, lobbying techniques, technical information and monitoring and evaluation;

**Exchange** information and ideas, share experiences and case documentation of success stories of malaria prevention and control without use of DDT;

**Harmonise** Community Pesticide Action Monitoring (CPAM) activities at national and regional levels;

**Advocate** for the development of a full cost benefit analysis and life cycle assessment of DDT and alternative, including social, environmental, health cost and job beneficiation; and

**Demand** to participate in the UNEP/GEF/WHO program on *Demonstrating and Scaling-up of Sustainable Alternatives to DDT in Vector Management (DSSA - Global Programme)* especially in projects designed for the sub-Saharan African region.
ANNEX 4: Statement for COP4: Towards malaria reduction without DDT

Malaria is a global crisis, which requires effective attention and dedication by the global community to roll it back. Bearing in mind, that malaria can be eradicated without DDT, the Parties to the Stockholm Convention committed to “reducing and ultimately eliminating the use of DDT.” To meet this goal, alternative approaches to eradicate malaria need to be implemented.

IPEN and PAN fully reiterate their support for the implementation of the Stockholm Convention including the mechanism for exemptions for the use of DDT to allow the implementation of cost effective community based long term solutions. However, IPEN and PAN raise concerns, that half a decade after the Stockholm Convention entered into force there has been an increase in the use of DDT while in several countries the use of DDT does not meet the standards set by WHO. This has caused unwarranted problems to the communities. We also note that Article 10 which demands public participation and education has not been complied with by the majority of the Parties to the Convention. Neither have measures to reduce reliance on DDT for malaria control been built into ongoing activities and actions.

We welcome the UNEP/WHO initiative for establishing a global partnership to develop alternatives to DDT. We urge and emphasize the importance of involving civil society organizations in this exercise to ensure that the program addresses the concerns of the public. This is also in the spirit of encouraging community participation in the implementation of the Convention. As such, we call on the GEF through its dedicated Implementing Agency UNEP, to honor positively forthcoming requests to assist NGO communities to support the implementation of the Stockholm Convention.

IPEN and PAN are aware that future initiatives need to broaden the approach to implement the Stockholm Convention in a timely manner. Effective approaches include, inter alia:

- Further developing IVM guidelines into Integrated Vector and Disease Management (IVDM) and adjusting them to local needs;
- Carrying out IVDM demonstration projects in Africa including strong involvement of civil society;
- Scaling up IVDM approaches;
- Implementing monitoring and evaluation activities in projects (including bio-monitoring of breast milk as a valuable indicator to determine the status of DDT chemicals body burden) and eco-toxicological outcomes.
- Implementing projects that will enable focalized treatment of malaria victims and reduce reliance on DDT and enable Parties to realize the objectives of the Convention.
International funding mechanisms (like Global Fund, GEF and others) are financing a substantial part of the global initiatives to implement the Stockholm Convention. We encourage the international community to honor their pledges and maintain the flow of funds despite the current financial crisis. In the same vein, we are also raising concerns about the slow, demanding and bureaucratic process of securing GEF funds and about the insufficient involvement of the Global Fund for AIDS, Tuberculosis and Malaria in IVDM approaches to DDT.

While intensive malaria control programs are achieving good results, it is important for Parties and stakeholders to invest in the development and implementation of IVDM including environmental preventive measures and focalized treatment of malaria victims— an approach that has proved to create good results in reducing malaria incidences in various countries.

Parties to the Stockholm Convention must keep their obligation to ‘reduce and ultimately eliminate’ DDT. The 163 governments that have ratified the Stockholm Convention need to achieve its objectives. Future investments and activities must result in a reduction and ultimate elimination of the use of DDT within a defined time frame. A redoubled effort to introduce safer, effective and more sustainable alternatives according to a defined time table is urgently needed.

IPEN and PAN are aware that Parties at COP4 will ask for exemptions for DDT production and use. We call for thorough assessment and analysis of actions taken by the Parties, including their due diligence with reference to Part II, paragraph 5b of the Stockholm Convention, before granting such exemptions.

One Party is submitting request for exemption to continue using DDT as an intermediate in the production of dicofol. In a separate paper IPEN has provided an analysis on the flaws in this application. We sincerely plead that this extension should not be granted.

The COP4 will be asked to evaluate the continued use of DDT for disease vector control. IPEN and PAN would like the COP to consider in greater details whether the conditions put in place ensure that DDT does not continue to cause global environmental and health concerns.
**ANNEX 5: PRESENTATIONS**

### GENERAL CONCEPT/KEY NOTE ON DDT

**Background and Context**

J.H.Y. Katima

**Debate on DDT**

- Pro and against Indoor Residue Spraying (IRS)
- Marjorie Mazel Hecht (2006) - *Malaria kills one child every 30 seconds* (Is this true or a sensationalisation of the malaria occurrence?)

**Debate on DDT**

- The above statement means 15,768,800 die every year
- In 2006 population in sub-Saharan Africa was 770.3 mil.
- Which means the dying children in about 2%.
- But the growth rate of sub-Saharan Africa 2.36%

**Debate on DDT**

- Considering that the above figure do not include the under 5 and those dying with AIDS and other diseases
- When you combine all these suggest that the sub-Saharan population growth should be negative

**Debate on DDT**

- Frequently quoted examples:
  - Eradicated in Europe and the USA, and the burden of the disease was reduced in Africa, Asia and Latin America.
  - Greece – achieved a drop from 1-2 million cases a year to close to zero.
  - India, malaria deaths went from nearly a million in 1945 to only a few thousand in 1960 because of stopping use of DDT.

**Debate on DDT**

- Frequently quoted examples:
  - Sri Lanka, malaria cases went from 2,800,000 in 1948, before the introduction of DDT, down to 17 in 1964 — then, tragically, back up to 2,500,000 by 1969, five years after DDT use was discontinued.
  - South Africa malaria cases increased by 1000% in the late 90s alone (but dropped 80% in 2000 alone in KwaZulu Natal, the one province that made extensive use of DDT).
Debate on DDT

- These data do not look on the other side of the coin:
- The argument disregard the fact that DDT is banned because it is a poison that can kill any living creature, including humans, and can cause sterility – effects of DDT on human health will be presented by experts.

While it is true Malaria is increasing in many countries which might be tempting to attribute this increase to reduced use of DDT, in reality the realistic picture is more complex. For example:
- In some countries, mosquitoes developed resistance to DDT.
- In others, civil unrest and severe rains have impeded delivery of malaria control services.

In still others, migration into frontier areas lacking adequate shelter has caused malaria to increase. In many instances, severely strained malaria control budgets have limited governments’ ability to respond.
- In many others poverty severity and persistence undermine majority of non-DDT interventions
- Lack of political commitment (locally and internationally)

Unless we recognize these complexity even with intensive application of DDT we will never eradicate Malaria

WHO Position

- WHO 2006 – Position Statement
- WHO’s Global Malaria Programme recommends the following three primary interventions
  - diagnosis of malaria cases and treatment with effective medicines;
  - distribution of insecticide-treated nets (ITNs) to achieve full coverage of populations at risk of malaria; and
  - IRS as a major means of malaria vector control to reduce and eliminate malaria transmission including, where indicated, the use of DDT.

Question is the above in order of priority? If yes why jump to the last bullet before exhausting 1 and 2

The damaging statement appears 2.2

“However, another important factor has been general disapproval of DDT use, due to fears of its harmful effects on the environment and on human health, fears which are unjustified when DDT is used appropriately for IRS.”

What is appropriate use???
Concern over Malaria – CSO Perspective

- Many people are dying because of malaria.
- Malaria imposes a horrendous social and economic burden.
- No body in his right mind will object any intervention that will save lives.
- But the Precautionary Principle, which the Global Community ascribed to it under the Rio Declaration, also recognized under SAICM, cautions us on not doing anything because of lack of adequate information.

Concern over Malaria – CSO Perspective

- Assuming those who are doubting the accuracy of the available evidence of toxicity of DDT they are right – “It is important to remember that absence of evidence of risk is not the same thing as evidence of absence of risk”.

POPs and Stockholm Convention

- Concerns over the safety of DDT, have been comprehensively addressed in the framework of the Stockholm Convention on Persistent Organic Pollutants (POPs).
- The Convention bans the use of DDT, except for public health purposes.
- Therefore, DDT can be used for IRS where it is indicated, provided that stringent measures are taken to avoid its misuse and leakage outside public health.
- The question is are these stringent measures in place? Or even observed when applying IRS? Some of the presentation will show us that is not the case.

POPs and Stockholm Convention

- The Convention states that countries that rely upon DDT for malaria control should follow World Health Organization guidelines. These guidelines are intended to help prevent DDT from escaping into the environment.

POPs and Stockholm Convention

- Although the Stockholm Convention allows countries to continue using DDT for malaria control, it encourages them also to consider safe, effective, and affordable alternatives.
- The question is who is conducting research in order achieve the above?

POPs and Stockholm Convention

- It worrying that the provisions that will ensure the final phase out are not being given due weight. For example
  - Technical and financial uncertainties associated with DDT and its alternatives is still a huge contentious issue facing the Conference of Parties.
  - Malaria funding is only focusing on single type intervention – why?
**POPs and Stockholm Convention**

- Searching for alternatives is not given priority

**What are the objectives of this meeting**

- A lot of efforts (probably un-coordinated) to fight DDT use have been taking place – are we aware of all them do we know their status and impacts
- The Developing countries (which have maintained the need to use DDT), Tanzania included, claim that there are no effective alternatives – do we know them, are there success stories we can tell about them? what are the barriers in using the alternatives

**What are the objectives of this meeting**

- COP4 is around the corner. Among the items to be discussed:
  - Evaluation of continued use of DDT for disease vector control
  - DDT Business plan for promoting a global partnership on the development and deployment of alternative products, methods, and strategies to DDT for vector control
  - India intends to request extension of exemption to continue using DDT as an intermediate in the production of pesticide “dicofol” – IPEN has developed a detailed analysis and a request to COP4 not accept India’s request

**What are the objectives of this meeting**

- There will also be a DDT side event organized by WHO. IPEN will be given a 10 minutes slot to speak – what should be the topic and message?

---

**Thank you**
# National Malaria Control Program-Ethiopia

## Overview of DDT Use in Ethiopia

### Information Dissemination Workshop

**On the status of DDT use,**

*Seife Bashaye, April 2009*

## Out line

- Back Ground and Introduction
- DDT Assessment at Global level
- Comparison of DDT with Other Insecticides
- Ethiopian Experience in Using DDT:
- Challenges and The way forward

## Background

- SA 1.1 million Km²
- Population estimated 73,845,035 (2007 census)
  - 84% Rural
- There are 9 regional states and 2 city administrative councils
- 736 woredas (districts) and 15,000 kebeles
  2HEW for each kebele

## Cont..

- Under-five mortality rate 123/1000 live births
- Neonatal mortality rate 39/1000 live births
- Infant Mortality 77/1000 live births
- Maternal Mortality Ratio live births
- Total fertility rate 5.4
- 2007 – DPT1 – HepB – Hib coverage 72.6% *
- 2007 – TT2+ for Pregnant women 62.2% *

## Introduction

- **DDT** (para,Para'Dichlorodipheniltrichloroethane) is a persistent Organochlorine compound which was widely used as insecticide in agriculture in different countries including Ethiopia.

- synthesized in 1974 where it’s insecticidal properties have been clearly identified in 1939.

## Cont..

- Was in use in Developed Countries
- USA (Until 1972), United Kingdom (until 1984), Germany (until 1974) Canada (until 1989) Sweden and Norway (until 1970) were some of them
- The Stockholm convention which entered in to force in May 2004, had a goal of reducing and ultimately eliminating the use of DDT
### Cont

- WHO, International Program on Chemical safety (IPCS), United Nations Environmental Program, International Labor Organization (ILO), the initiatives by FAO, and others involved in the issue
- But the continued need for DDT in diseases vector control as indoor Residual spray sustained

### DDT Assessments at Global Level

Contemplation in Withdrawal from DDT were largely related to Environmental Concerns
- transportation of DDT far from origin of use via biotic and a biotic factors and its accumulation in the fat tissues of animals, oceans, lakes rivers and air
- its toxicity to aquatic life mainly the fish including the amphibians

### DDT ASS Cont..

- The other factor is its Persistence in the environment related to its half life in different media, soil and water. (up to 15 years in soil)
- Some peoples link it to egg shell thinning in birds (controversial).
- These Environmental concern was realized mainly when DDT was released in to open environment linked to agriculture.

### DDT Ass Cont

- For instance in USA alone DDT reached up to 36,000 metric tones/year by mid 50s. A total of 613,000 mt tones had been in use there in the USA
- DDT as in IRS no justification on adverse effect has been identified that can Change The WHO Position not to use it.

### Some Explicit Documents

- International Program on Chemical Safety (IPCS) assessments conducted as early as 1995 showed that 12 Persistent Organic Pollutants) POPs were identified
- a number of health related concerns like impaired reproduction, endocrine dysfunction and immuno- suppression raised

### Cont

- The IPCS global Assessment conducted in 2000 reported that the biological plausibility of possible problems to certain human functions like reproductive systems.
- The assessment conducted by WHO was the most recent which considered a number of evaluations undertaken by Joint Meeting on Pesticides Residues (JMPR) in 2000
- concluded that DDT and its metabolites show wide range of long term health effects in laboratory animals
<table>
<thead>
<tr>
<th>Cont..</th>
<th>Cont..</th>
</tr>
</thead>
<tbody>
<tr>
<td>• despite the range of effects in animals, epidemiological studies in Humans did not support hypothesis that DDT or its metabolites increased rates of pancreatic cancer, multiple myeloma, breast cancer, uterine cancer or prostate and testicular cancer.</td>
<td>• All studies that were reviewed showed that no correlation between exposure to DDT and still births, miscarriage or premature rupture of fetal membrane</td>
</tr>
<tr>
<td>• An over all outcome from the review of JMPR meeting in 2000 agreed the provisional Tolerable Daily intake (PTDI) to 0.01mg/kg bw based on toxicity in rats</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cont..</th>
<th>Cont.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• JMPR further concluded that the available data on humans did not show causal relationships for carcinogenicity in any organ system or significant adverse effects after repeated exposure to concentrations up to 0.25 mg/kg bw per day.</td>
<td>• This assessment documented the reproductive, developmental and other effects on animals excluding humans.</td>
</tr>
<tr>
<td>• The Joint WHO /FAO International DDT risk assessment was the other source</td>
<td>• WHO, based on these assessment findings, came to the conclusion that there is no reason to change the use of DDT for Vector Control.</td>
</tr>
<tr>
<td></td>
<td>• Different reviews made by WHO in different forums conducted in different countries, i</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cont..</th>
<th>Cont.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Different reviews made by WHO in different forums conducted in different countries,</td>
<td>• Recommended that DDT can be used in malaria endemic Countries in addition to the epidemic affected ones, which was not the tradition before 2006. The most “PRO DDT”</td>
</tr>
<tr>
<td>• Consultative meeting Resolution regarding health effects on DDT delivered in Congo Brazzaville in 2006,</td>
<td></td>
</tr>
</tbody>
</table>
Comparison of DDT with Other Insecticides

- DDT so far is the first line insecticide used for IRS, because it is the cheapest, relatively safe, and effective under close monitoring & long residual effect – greater than 6 months.

- DDT may be used for vector control provided that all the following conditions are met.

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Class</th>
<th>Recommended dosage of active ingredients (gm/m²)</th>
<th>Duration of effective action (months)</th>
<th>WHO toxicity rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDT</td>
<td>Organochlorine</td>
<td>1-2</td>
<td>&gt;6</td>
<td>II</td>
</tr>
<tr>
<td>Fenitrothion</td>
<td>Organophosphate</td>
<td>2</td>
<td>3-6</td>
<td>II</td>
</tr>
<tr>
<td>Malathion</td>
<td>Organophosphate</td>
<td>2</td>
<td>2-3</td>
<td>III</td>
</tr>
<tr>
<td>Pirimiphos-methyl</td>
<td>Organochlorine</td>
<td>1.2</td>
<td>2-3</td>
<td>III</td>
</tr>
<tr>
<td>Propoxur</td>
<td>Carbamate</td>
<td>1.2</td>
<td>3-6</td>
<td>II</td>
</tr>
<tr>
<td>Bifencarb</td>
<td>Carbamate</td>
<td>0.1-0.4</td>
<td>2-6</td>
<td>II</td>
</tr>
<tr>
<td>Alphacypermethrine</td>
<td>Pyrethroid</td>
<td>0.02-0.03</td>
<td>2-6</td>
<td>II</td>
</tr>
<tr>
<td>Cyfluthrin</td>
<td>Pyrethroid</td>
<td>0.02-0.05</td>
<td>2-6</td>
<td>II</td>
</tr>
<tr>
<td>Deltamethrine</td>
<td>Pyrethroid</td>
<td>0.02-0.05</td>
<td>2-6</td>
<td>II</td>
</tr>
<tr>
<td>Lambda-cyhalothrin</td>
<td>Pyrethroid</td>
<td>0.02-0.03</td>
<td>2-6</td>
<td>II</td>
</tr>
<tr>
<td>Bifenthrine</td>
<td>Pyrethroid</td>
<td>0.025-0.05</td>
<td>3-6</td>
<td>II</td>
</tr>
</tbody>
</table>

Cont..

Key: Ia=Extremely hazardous; I b=Highly hazardous; II=Moderately hazardous; III=Slightly hazardous; U=unlikely to be hazardous; Source World Health organization, The Who Recommended Classification of pesticides by Hazard, 2005.

Ethiopian Experience in Using DDT:

- Major epidemics occur every 5 - 8 years, but focal epidemics occur every year, before three years.

- Two parasite species
  - *Plasmodium falciparum* (60%)
  - *P. vivax* (40%)

- Main malaria vector
  - *Anopheles arabiansis*
  - *Anopheles pharoensis*
## Cont.. Malaria is a major public health problem in Ethiopia
- Every year it was the leading cause of outpatient consultations, admissions and death
- Recently, however, the rapid scale up of interventions has brought about significant decline in malaria burden
  - In 2006/7 it become 6th cause of outpatient consultations
  - No malaria epidemic report

## Cont
- Depends on topography and climate
- 75% of the land mass malarious
- > 52 million 68% of the population at risk
- 400,000-500,000 microscopically confirmed cases/year
- 4 - 5 million clinical cases/year

## Con.. Malaria Epidemic
- Malaria epidemics first documented in 1930,
- 1953 -1955 : About 7000 malaria deaths reported from epidemic affected places in Gonder area near Lake Tana,
- In 1953 which further continued to hit Bahir Dar area, south of L. Tana,
- 1958 (June – December) massive epidemic in the Dembia Plains with 3 million cases & about 150,000 deaths (100,000 square miles area of altitude range of 1600-2150 m affected),

## Main Strategies
- Early Diagnosis and prompt Treatment
- Selective Vector Control (IRS, ITNs, Environmental control including abates)
- Early Detection and prompt Containment of Epidemics
- Supportive (Surveillance, H.ED, Training, Operational R..)

(Goal: To eliminate Malaria by 2020)

## DDT Exp.
- Indoor residual spraying has been implemented in Ethiopia for more than 4 and half decades. Mainly as epidemic control
- The insecticide used is DDT 75%
- Every year 20% – 40% of spray able localities covered

## Cont..
- DDT is the first line insecticide used for IRS, (cheap, effective & long residual effect – up to 6 months),
- Indoor residual spraying is applied in epidemic prone areas on selective basis - once or twice a year
DDT Consumption

- Six years Data

IRS techniques

- IRS is undertaken in spray teams (a team has 4-5 spray persons)
- Spray persons are given training for 6 days on spraying techniques and safety precautions, adequate information to households is also given.
- The spray-men are provided with safety materials like coveralls, straw huts, hand gloves, washing soaps, etc to protect themselves from contamination during and after spraying.

Cont..

- The insecticide is normally pre-packed in sachets of 535 gms to be added in 8 liters of spray pumps,
- After completing the spraying, households are given education to close the door for ½-1 hour before cleaning the floors,
- Finally, the left-over insecticide and the dust from the cleaned house is buried in pits.

Main Challenges

- Emerging Vector Resistance against DDT (Susceptibility Study results in Four regions, Afar, Amhara, Oromia and SNNPR specific sites)
- Challenge in Finding Alternative insecticide

Challenges while using DDT

- Shortage of Spray chemical
- Inadequate supply of Spray apparatus
- Trained man power
- Operational Fund and proper report
- Surveillance
- Operational Research
- Challenge related to leakage out door
The way for ward

- Establish and/or strengthen insecticide resistance monitoring, evaluation and management systems and conduct entomological studies;
- Work on finding Alternative Insecticides including Insecticide Treated Nets (20.4 million Nets distributed over three years period) So far Deltamethrine impregnated

Cont

- Apply current WHO guidelines and recommendations for the use of DDT for IRS;
- collect and report to WHO on DDT exposure data;
- Share experiences and information on malaria vector control in general and the use of DDT for IRS in particular;

Cont..

- Establish budget lines for sustainable vector control in particular and malaria control in general;
- Promote inter-sectoral collaboration for the judicious use of DDT for IRS;
- Encourage cross-border collaboration;

Cont

- Establish effective regulatory mechanisms for safe use of DDT;

Thank You!
<table>
<thead>
<tr>
<th>National Malaria Control Program-Kenya</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USE OF DDT ALTERNATIVES IN MALARIA VECTOR CONTROL –KENYA</strong></td>
</tr>
<tr>
<td>Dr Kiambo Njagi,</td>
</tr>
<tr>
<td>Division of Malaria Control; Ministry of public Health and Sanitation</td>
</tr>
<tr>
<td>E-Mail: <a href="mailto:knjagi@domckenya.or.ke">knjagi@domckenya.or.ke</a></td>
</tr>
</tbody>
</table>

**Malaria**

- Malaria remains the leading cause of morbidity and mortality in Kenya; accounting for 30% of out patient attendance
- Four interventions:
  - Case management
  - Vector control – insecticide based (ITNs and IRS)
  - Prevention of malaria in pregnancy
  - Epidemic preparedness and prevention - Insecticide based (IRS)

**Malaria vector control in Kenya**

- Two main methods are LLINs and IRS both dependent on insecticides
- LLINs/ITNs distribution is used as alternative to DDT, with current coverage of 63% of household with one net
- Concern have been raised on environmental impact on used nets; could nets be “POPS”?
  - How should they be disposed off safely?
  - Are they recyclable, if yes to what products?

**Classes of insecticides**

- Organo-chlorines – DDT – Useful for IRS
- Organophosphates – Useful for IRS
- Carbamates – Used for IRS
- Pyrethroids – Used both for indoor residual spray and insecticide treated nets
- DDT is restricted due to fear of insecticide resistance, we can use it as the last results, its use has to be according to The Stockholm convention on persistent organic pollutants (POPs) and WHO guidelines.

**Insecticides for IRS**

- All the four classes may be selected, but consideration on:
  - Duration of residual effect on sprayed surfaces, longer with DDT, Pyrethroids; shorter with others and therefore require re-application within same transmission cycle
  - Mammalian Toxicity – lower in DDT and Pyrethroids, higher in organophosphates and carbamates

**MALARIA IS A BIGGER PROBLEM THAN DDT, particularly during epidemic**

Cerebral malaria in a comatose child with opisthotonus.
### Insecticides for IRS-contd

- Susceptible to local vector, mosquitoes resistance to DDT is documented in most malaria endemic areas, closing monitoring is required to prolong the life of newer insecticides
- Biting/resting pattern of local species of malaria vector.

### Insecticides for IRS-contd

- Environmental - DDT NOT bio-degradable trace found along the food chain, others break down to harmless compounds
- cost –Relative, transportation cost, application, protection to human and environmental, bulk in DDT
- Social acceptability to house owners, strains and smell are not tolerated

#### Use
- Article 6 deals with stockpiles, their management & storage.
- Annex B deals with DDT
- Restrict production & use in accordance with WHO recommendations and guidelines
- Every 3 yrs provide information on amount used, conditions of use, relevance to the disease management strategy

#### LLINs
- Insecticides used in LLINs belongs to the class pyrethroids
  - Deltamethrin
  - Permethrin
  - Aphacypermethrin
  - Lambda cyhalothrin

#### Could LLIN be POPS
- What happens to used nets? It has insecticide up to 40% and some net are made from non-biodegradable materials polyethylene

#### IRS
- IRS has been in use since 2002, for prevention of highland malaria epidemics
- From 2008, and with support of PMI, the NMCP is scaling up IRS to endemic districts
- Pyrethroids –synthetic and natural pyrethrums extract
Conclusion

- DDT is NOT currently used in Kenya as the two major malaria vectors interventions (LLINs & IRS) depends on pyrethroids with acceptable results
- DDT is not de-registered, as it can be used in case of insecticide resistance to other insecticides, with emerging malaria epidemics

National Malaria Control Program-Uganda

Experience Sharing on Malaria Control & Alternatives to DDT

Presentation Format

- History & Malaria Epidemiology
- Burden of Disease
- Background to DDT use in Uganda
- DDT use in other countries
- Why DDT use and How?
- Opposition
- Achievements of recent IRS DDT use in Uganda

Problem definition: Malaria Situation World

- Globally 350–500 million malaria cases reported annually
- Three million people die from malaria each year
- In Africa one person dies from malaria every 30 seconds. (80% of global deaths due to malaria)
- In Uganda 320 people die from malaria each day
Global distribution of malaria

Burden of Malaria in Uganda

- Malaria accounts for 26% of the burden of Disease in Uganda (BOD Uganda 1995) and is responsible for:
  - One in every 3 persons attending OPD (33%)
  - One in every 4 persons admitted in hospitals (25%)
  - One in every 5 child deaths in hospital (20%)
  - 70,000 – 120,000 child deaths in a year or 320 deaths every day
  - Severe anaemia in children/pregnancy, low birth weight
  - Severe economic losses, lost school days, low economic productivity, long term disability

Goal and Overall Objective of Malaria Control

- **Goal**: To control and prevent malaria morbidity and mortality, minimize social effects and economic losses attributable to malaria in the country.
- **Overall objective**: Go to national scale with effective interventions to prevent and treat malaria and sustain high coverage levels

Source: Reproduced from a presentation by Dr Andrew Kitua, National Institute for Medical Research, Tanzania
Prehistory: Use of DDT in Uganda

- In 1959-63, the then Colonial Government, following the overpopulation trends in Kigezi District, decided to migrate some families from Kisoro to part of the Queen Elizabeth National Park. However, due to the high mortality and morbidity due to malaria that subsequently followed, government initiated the N. Kigezi Malaria Eradication Project using DDT.

- Consequent to the results from this project and examples from other countries (S.A, Eritrea, Ethiopia, Israel etc and based on TA from WHO, Stockholm Convention, NEMA MoH decided to use DDT in Malaria Control

Use of DDT in Uganda (2)

- DDT was also used to control Simulium flies along the Victoria Nile at Owen Falls Dam and led to the elimination of the onchocerciasis focus along the Victoria Nile area.

Use of DDT in Africa

Countries currently using DDT in Africa include:

- Ethiopia
- South Africa
- Swaziland
- Eritrea
- Namibia
- Madagascar
- Mauritius
- Morocco
- Mozambique
- Sudan
- Zambia
- Zimbabwe

- More countries, especially SADC countries, are coming on board to use DDT for malaria control
Country: Registration date

Botswana: 29 September 2004
People’s Republic of China: 2 February 2005
Ethiopia: 12 September 2006
India: 27 October 2006
Madagascar: 27 August 2007
Marshal Islands: 22 May 2004
Mauritius: 27 September 2007
Morocco: 14 April 2005

Country: Registration date

Mozambique: 13 September 2007
Myanmar: 8 August 2006
Senegal: 9 July 2006
South Africa: 24 November 2004
Swaziland: 28 June 2006
Uganda: 20 July 2008
Republic of Yemen: 29 March 2005

Malaria Cases and Deaths - South Africa 1971 - 2004

Anopheles funestus disappears from SA
Chloroquine resistance develops
Synth. Pyrethroids replace DD
T
Synth. Pyrethroid resistant An. funestus found
68% resistance to Sulphadoxine Pyremethamine
DDT reintroduced in KZN
Coartem introduced in KZN

Source: SA Dept of Health


Incidences of malaria before and after IRS use of DDT (Büchel, 1983)

<table>
<thead>
<tr>
<th>Country</th>
<th>Year before DDT use</th>
<th>No. of cases</th>
<th>Year after DDT use</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuba</td>
<td>1962</td>
<td>3,519</td>
<td>1969</td>
<td>3</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1954</td>
<td>4,417</td>
<td>1969</td>
<td>0</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1943</td>
<td>8,171,115</td>
<td>1958</td>
<td>800</td>
</tr>
<tr>
<td>India</td>
<td>1935</td>
<td>&gt;100 million</td>
<td>1969</td>
<td>285,962</td>
</tr>
<tr>
<td>Italy</td>
<td>1945</td>
<td>411,602</td>
<td>1968</td>
<td>37</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>1937</td>
<td>169,545</td>
<td>1969</td>
<td>15</td>
</tr>
<tr>
<td>Taiwan</td>
<td>1945</td>
<td>&gt;1 million</td>
<td>1969</td>
<td>9</td>
</tr>
<tr>
<td>Sri Lanka (Ceylon)</td>
<td>Before 1950</td>
<td>&gt;2 million</td>
<td>1963</td>
<td>17</td>
</tr>
</tbody>
</table>

Reasons for using IRS (including DDT) for Malaria Control in Uganda

- Both WHO and the Stockholm Convention on POPs permit the production and use of DDT strictly for disease vector control, under WHO recommendations and guidelines.
- Despite efforts to control malaria in the Uganda, malaria morbidity and mortality in country continues to increase (as shown in the graph) mainly because of insufficient action to break the transmission cycle.
Reasons for using IRS (including DDT) for Malaria Control in Uganda (Cont.)

- Vector Control (VC) to reduce malaria vectors is therefore an essential component of any malaria control programme and is very vital for Malaria Elimination.
- The use of IRS, including the use of DDT, is therefore key to reducing the morbidity and mortality associated with malaria.
- IRS is also the most cost-effective method for controlling malaria epidemics.
- DDT either kills on contact toxicity, volatile toxicity and repellent activity of mosquitoes in a sprayed house and the few mosquitoes that venture in, most exit without biting, thus reducing malaria transmission.
- DDT is both cheaper and more effective than any of the alternative insecticides available.
- DDT maintains its ability to repel and kill malaria vector mosquitoes after being sprayed on inside walls of houses for >9 months, which is not the case with alternative insecticides.

Anopheles Female mosquitoes feed and rest indoors. Therefore, DDT spraying for malaria control is only done INDOORS and NOT OUTDOORS.

- DDT is sprayed in small quantities indoors and therefore it has minimal environmental effects.
- Evidence suggests that the reported environmental effects were a result of DDT overuse in agriculture and NOT from indoor spraying for malaria control.
- The tremendous public health benefits of DDT outweigh the “feared” health risks.

WHOPES recommended insecticides for IRS against malaria vectors

<table>
<thead>
<tr>
<th>Compound and Formulation</th>
<th>Class</th>
<th>Dosage g/m²</th>
<th>Duration effective (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>alpha-cypermethrin – WP; SC</td>
<td>P</td>
<td>0.02 – 0.03</td>
<td>4-6</td>
</tr>
<tr>
<td>bendiocarb – WP</td>
<td>C</td>
<td>0.10 – 0.40</td>
<td>2-6</td>
</tr>
<tr>
<td>bifenox – WP</td>
<td>C</td>
<td>0.025 – 0.050</td>
<td>3-6</td>
</tr>
<tr>
<td>cyfluthrin – WP</td>
<td>P</td>
<td>0.02 – 0.03</td>
<td>3-6</td>
</tr>
<tr>
<td>DDT – WP</td>
<td>OC</td>
<td>1.0 – 2.0</td>
<td>3-6</td>
</tr>
<tr>
<td>deltamethrin – WP</td>
<td>P</td>
<td>0.010 – 0.025</td>
<td>2-3</td>
</tr>
<tr>
<td>etofenprox – WP</td>
<td>P</td>
<td>0.10 – 0.150</td>
<td>3-6</td>
</tr>
<tr>
<td>fenitrothion – WP</td>
<td>OP</td>
<td>2.0</td>
<td>3-6</td>
</tr>
<tr>
<td>lambda-cyhalothrin – WP</td>
<td>OC</td>
<td>0.02 – 0.03</td>
<td>3-6</td>
</tr>
<tr>
<td>permethrin-methyl – WP, EC</td>
<td>OP</td>
<td>1.0 – 2.0</td>
<td>2-3</td>
</tr>
<tr>
<td>propoxur – WP</td>
<td>C</td>
<td>1.0 – 2.0</td>
<td>3-6</td>
</tr>
</tbody>
</table>

**Source:** Malaria Vector Control – WHO/CDS/WHOPES/2002.5

HLC Vector Biting Behavior
Apac & Oyam Districts, Uganda
Feb 2008

**Mortality rates of An. funestus from Oyam, Uganda exposed to DDT in CDC bottle bioassay - March 2008**

24 hr mortality = 0.98

Tests conducted 2-3 days after bottles were charged

**Collection method:** human-baited bednet traps and aspiration of resting mosquitoes inside homes.

Collection location: Tatoos Village, Aber sub-country, Oyam district

Dose: 100ug DDT/bottle

- 24 hr mortality = 0.98

[Tests conducted 2-3 days after bottles were charged]
Mortality rates of *An. gambiae* from Oyam & Aduku Districts exposed to DDT in CDC bottle bioassay, March 2008

- 24 hr mortality = .90
- Total *An. gambiae* tested: 84
- Collection method: larvae scooping and rearing
- Collection locations: Aduku sub-country, Apac district & Iceme sub-county, Oyam district
- Dose: 100ug DDT/bottle

Mortality rate of *An. funestus* from Oyam, Uganda exposed to deltamethrin in CDC bottle bioassay, March 2008

- 24 hr mortality = 0.46
- Total *An. funestus* tested: 103 (101 females, 2 males)
- Collection method: human-baited bednet traps and aspiration of resting mosquitoes inside homes
- Collection location: Tetoci Village, Aber sub-country, Oyam district

### Program Components

- System for supply of logistics, insecticide and equipment established
- Have trained and deployed 5000+ spray operators and wash persons
- All spray personnel underwent medical exam for fitness and a sample of bio-specimens tested for traces of insecticide
- Environmental monitoring conducted to assess compliance with set standards

### Opposition

Environmentalists and other members of society opposed to DDT that it causes, *inter alia*:

- Infertility
- Hepatocellular Cancer & others
- Terragenicity
- Impotence
- Brain damage
- Persistency in the environment
- Persists in food chain

### Main Characters in DDT Controversy:

- Disease Control Policies & Strategies

  - Public health policies therefore must be based on science and data, not on conventional wisdom or politics or Malwa rhetoric.
  - There is Scientific and Public Health Programmatic evidence on efficacy of DDT IRS for malaria control and elimination
**DDT and Cancer**

- There have been many studies conducted which had indicated DDT causes cancer but none has stood rigorous scientific enquiry.

- Indeed, there is no scientifically replicated study that has been cited as having unequivocally demonstrated a case of cancer from DDT after >50 years of DDT use.

**Arguments: DDT Toxicity and Human Health**

- Dr J. Gordon Edwards eating DDT (Esquire Magazine)
- Dr Edwards died at a ripe old age of 85 years despite eating DDT every time he gave a lecture on DDT for many years.
DDT/ DDE Assesss in Uganda for DDT IRS >40 years ago (2005)

A. Plasma levels

<table>
<thead>
<tr>
<th></th>
<th>Kihihi</th>
<th>Nyarusiza</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of samples</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>Mean SD of DDT ppb</td>
<td>52.41 (34.51)</td>
<td>4.05 (10.81)</td>
</tr>
<tr>
<td>Statistical significance</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation: There is a significant difference between the mean of plasma DDT in Kihihi and Nyarusiza people.

B. Levels of DDT in Urine

<table>
<thead>
<tr>
<th></th>
<th>Kihihi</th>
<th>Nyarusiza</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of samples</td>
<td>45</td>
<td>44</td>
</tr>
<tr>
<td>Mean (SD) of DDT in ppb</td>
<td>11.66 (17.66)</td>
<td>6.91 (9.67)</td>
</tr>
<tr>
<td>Significance of difference between means</td>
<td>0.12</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation: No significant difference.

C. Soil levels of DDT

<table>
<thead>
<tr>
<th></th>
<th>Kihihi</th>
<th>Nyarusiza</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of samples</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td>Mean SD of DDT ppb</td>
<td>7.28 (5.80)</td>
<td>1.09 (1.37)</td>
</tr>
<tr>
<td>Significance of difference between means</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation: The DDT concentration is significantly different in the two areas.

D. Levels of DDT in beans

<table>
<thead>
<tr>
<th></th>
<th>Kihihi</th>
<th>Nyarusiza</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of samples</td>
<td>22</td>
<td>15</td>
</tr>
<tr>
<td>Mean SD of DDT ppb</td>
<td>10.12 (14.12)</td>
<td>7.30 (14.81)</td>
</tr>
<tr>
<td>Significance of difference between means</td>
<td>0.57</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation: No significant difference.

Maximum DDT found in meat fat (Beef) around the world

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Amount (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Former Soviet Union</td>
<td>1991</td>
<td>2000</td>
</tr>
<tr>
<td>2.China</td>
<td>1990</td>
<td>4100</td>
</tr>
<tr>
<td>3.India</td>
<td>1993</td>
<td>7000</td>
</tr>
<tr>
<td>4.Egypt</td>
<td>1989</td>
<td>4100</td>
</tr>
<tr>
<td>5.Spain</td>
<td>1994</td>
<td>9100</td>
</tr>
</tbody>
</table>

Consultation/Coordination issues prior to DDT IRS in Uganda 2007 1

- Prior to Formulation of the IRS DDT Policy, consultations and coordination were made with the following:
  1. Sector Ministries (Agriculture, Animal & Fisheries, Water and Environment)
  2. Bodies such as: NEMA
  3. The Agro and Fish Export Community
  4. International bodies (WHO, Stockholm Convention)
  5. Visitation by MPs in the 6th Parliament to S. Africa

Stages taken by MoH prior to DDT IRS program implementation

- Open debates and sensitization of political leaders and the community
- Public Hearing by NEMA
- Application to the Stockholm Convention (SC) and WHO
- Fulfillment of conditions set by SC, WHO & NEMA prior to and after implementation
- Inauguration of the Multi-Sectoral IRS Monitoring Team
- Assurances of purchase of Uganda’s Agro-Exports by EU
Discussion

- QENP which drains Kihihi boasts of 100 mammal species, a remarkable 606 bird species and claims the highest biodiversity rating of any game reserve in the world.

- In comparison to our findings, DDT in blood drawn from European Ministers of Health and Environment were reported to the tune of 3300 ppb which is 66 fold of that found in Kihihi people.

- DDT is found in trace levels almost all over the world.
**Reasons for using IRS (including DDT) for Malaria Control in Uganda**

- Both WHO and the Stockholm Convention on POPs permit the production and use of DDT strictly for disease vector control, under WHO recommendations and guidelines.
- Despite efforts to control malaria in the Uganda, malaria morbidity and mortality in country continues to increase (as shown in the graph) mainly because of insufficient action to break the transmission cycle.

**Chemical management in IRS**

- Mgt of pgms using insecticides in public health is more strict than in agriculture
- There is very strict management of insecticides for IRS irrespective of class (OC, OPh, Py or Ca)
- All spray personnel are tested before and after IRS
- Pregnant women are not allowed to be involved in IRS
- Only well trained and closely supervised spray personnel are used
- There is close monitoring insecticide use to ensure strict accountability of insecticides
- The spray personnel, the community members, domestic animals and the environment are protected

**DDT/DDE in food stuffs in Toronto, Canada (1996)**

<table>
<thead>
<tr>
<th>Food code</th>
<th>Name of food</th>
<th>DDT/DDE ppb</th>
</tr>
</thead>
<tbody>
<tr>
<td>G16</td>
<td>Raw potatoes</td>
<td>0.49</td>
</tr>
<tr>
<td>G18</td>
<td>Boiled unpeeled potato</td>
<td>0.54</td>
</tr>
<tr>
<td>G08</td>
<td>Celery</td>
<td>0.64</td>
</tr>
<tr>
<td>G04</td>
<td>Broccoli</td>
<td>2.30</td>
</tr>
</tbody>
</table>

**DDT/DDE in Kihii Fish samples 2005**

<table>
<thead>
<tr>
<th>Type of fish</th>
<th>DDT/DDE (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarius (Male)</td>
<td>0.00</td>
</tr>
<tr>
<td>Tilapia (Ngege)</td>
<td>0.12</td>
</tr>
<tr>
<td>Haprochromis (Njunguli)</td>
<td>3.94</td>
</tr>
<tr>
<td>Protopterus (Mamba)</td>
<td>4.92</td>
</tr>
<tr>
<td>Bagrus (Smutundu)</td>
<td>22.98</td>
</tr>
</tbody>
</table>
Coincidental DDT in Pre Spray samples in Northern Uganda 2008

<table>
<thead>
<tr>
<th>Location</th>
<th>No. of samples</th>
<th># samples with DDT below detectable level</th>
<th># samples with detectable level DDT</th>
<th>DDT ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homesteads</td>
<td>75</td>
<td>48</td>
<td>27</td>
<td>615</td>
</tr>
<tr>
<td>Cotton Building</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>1.8</td>
</tr>
<tr>
<td>Dust</td>
<td>83</td>
<td>75</td>
<td>8</td>
<td>0.2</td>
</tr>
<tr>
<td>Soil</td>
<td>100</td>
<td>63</td>
<td>37</td>
<td>0.4</td>
</tr>
<tr>
<td>Human Urine</td>
<td>100</td>
<td>63</td>
<td>37</td>
<td>0.4</td>
</tr>
<tr>
<td>Serum</td>
<td>100</td>
<td>63</td>
<td>37</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Way Forward

- Build capacity for IRS, both at national and district level
- Initially utilize pyrethroids to build a strong IRS system in the country and build capacity and confidence amongst spray personnel before re-introducing DDT IRS
- Document lessons learnt from pyrethroid IRS for going to scale with IRS
- Conduct routine IRS in a phased & mosaic manner – start with a few districts and extend to more districts.
- Recruit CSO as allies in the monitoring and sensitization of communities in IRS and other malaria control programs

References

6. Andrea Dankwardt 1999
   Recommendations about the use of Immunochemical methods for the FAO/IAEA Training reference centre for food and pesticide control, UTG centre for Environmental Technologies, 86167 Augsburg, Germany.
8. Apac and Oyam (USAID, CDC, MoH) Spray Report

Disease Control Policies & Strategies

- Public health policies therefore must be based on science and data, not on conventional wisdom or politics or Malwa rhetoric.
- There is Scientific and Public Health Programmatic evidence on efficacy of DDT IRS for malaria control and elimination

Environmentalists Perception of Malaria Control Programs...
NGO Experiences on Country Malaria Control Programmes/ Plans

**ETHIOPIA**

**THE STATUS OF DDT USE IN THE ETHIOPIAN RIFT VALLEY**

By

Tadesse Amera
PAN-Ethiopia

April 6-8, 2009
Dar-es-Salaam, Tanzania

**Based on two studies**

- An assessment of pesticide use, practice and hazards in the Ethiopian Rift Valley.
  - About 30% of the study participants confirmed that they are using DDT for Agriculture.
  - Elderly people drink diluted cup of DDT for “Malaria prevention”
- Comparative study of impacts of cotton IPM in southern Ethiopia Rift Valley
  - About 30% of farmers use DDT for Agriculture pest control

**Other cases of DDT**

- DDT residue obtained in export coffee and Japan
  - Banned import
- DDT resistance not studied
- DDT use increase every year
- DDT formulation plant at the Ethiopian Rift Valley
  - Affecting the Rift Valley bio-diversity

**Efforts for mitigation**

- Fund obtained from SAICM
- A one day workshop organized
- People from
  - Health, Agriculture, Quality and standard, Trade and industry of the government
  - Universities
  - NGOs
  - UN Agencies and
  - Private sector were invited
Participants of the Workshop

What was presented

- The case of Malaria and DDT by MoH of Ethiopia
- The status of DDT Use in the Ethiopian Rift Valley by PAN-Ethiopia
- DDT-RRA by PAN-Ethiopia

Group Discussion

Group Discussion Results

- Major Problems attributed to DDT use:
  - Public Health
  - Environmental contamination
  - Affect national economy
  - Negative image on the country

Group Discussion

- Causes of the problem are:
  - Misuse of DDT by farmers/sprayers, producers (Adami Tulu pesticide Plant), retailers
  - Lack of awareness / Knowledge at all levels
  - Pest identification & pesticide selection
  - Source of DDT
  - Availability (price & nearby)
  - Contraband trade across border and in country
  - Inaccurate estimation of DDT required by Ministry of Health

Group Discussion...

- Solutions:
  - Training of Trainers for Health Extension Workers, Development Agents and Woreda experts
  - Awareness creation campaign to farmers, sprayers, authorities and retailers
  - Coordination among Ministry of Health, Ministry of Agriculture and Rural Development, Ministry of Trade and Industry, Ministry of Education etc
  - Create information network
  - Alternative pest controlling mechanism
Group Discussion...

Solution...
- Community participation
- Hiring responsible sprayers and incentive mechanisms
- Using different media (Radio, TV, newspapers, posters, leaflets etc)
- Legal enforcement on across border & in country contrabands
- Border commission collaboration
- Involvement of Adami Tulu Pesticide Factory

Challenge

- The Coordination and Fundraising for the solution is left to PAN-Ethiopia

SOUTH AFRICA

African CSOs and Experts Meeting on DDT South African Update

April 07, 2009
By Mark Wells
mark@twig.org.za

Malaria is found in areas of Limpopo and Kwa-Zulu Natal Provinces

Main vector is Anopheles arabiensis which is not resistant to pyrethroids.

In 1999 and 2000 Anopheles phenestus re-emerged during the poorly managed 1999-2000 malaria epidemic.

DDT reintroduced after the 2000 malaria epidemic on the basis that Anopheles phenestus is resistant to pyrethroids.

No evidence to show that Anopheles phenestus has not once again been eradicated as it was when the DDT indoor residual spraying programme was first introduced more than thirty years ago.
South Africa remains committed to its DDT based “Roll-back Malaria” programme in all areas including the Limpopo province where the only vector is *Anopheles arabiensis* can be controlled effectively by pyrethroids.

Department of Health responsible for the Indoor Residual Spraying programme with good management of DDT inventories and containers.

Department of Environment and Tourism is responsible for the Stockholm Convention National Implementation Plan (NIP)

Government has not effectively implemented many of its NIP commitments

The division of responsibility on DDT has further contributed ineffective NIP implementation.

In the absence of a NIP DDT action plan it is not clear what the actual DDT usage is, although industry sources suggest that the actual DDT usage is in the order of 33 tons per year.

In 2007 South Africa had a DDT stockpile of 274 tons

Evidence shows that the levels of the DDT metabolite, DDE, in the bodies of residents of DDT sprayed houses in the Limpopo province was 216.5 mg/kg.[1]

Concerns:

1. Studies by Bornman et al show serious congenital birth defects of children from houses sprayed with DDT
2. Only mud huts are sprayed with DDT, ie. the poorest of the poor
3. Householders are not warned of the dangers of DDT
4. DDT used unnecessarily in the Limpopo province where there is no resistance to pyrethroids
5. No focus on the development of alternatives such as lippea javanica deterrent and Bt as a vector control
6. Efficacy of natural Bt vector control under threat from low level contamination of pollen and crop residues from Genetically Modified Bt crops engineered to release Bt toxins. (The Agricultural Research Centre have show that the SA Bolworm has become resistant to Bt due GM crop exposure)

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EYAN-GHANA

FIGHTING MALARIA IN GHANA

BY

OSEI AKOTO

ENVIRONMENTAL YOUTH ACTION NETWORK

GHANA

@ African CSOs and Experts Meeting on DDT,

Mbezi Garden Hotel, Dar es Salaam, Tanzania,

6-8 April 2009

INTRODUCTION

➢ 17 Million Ghanaians are infected by malaria every year

➢ It cost the nation US$94 million for treatment alone
### USE of DDT in Ghana for Malaria Control
- For Agricultural and public health purposes was banned in 1985
- Due to its damaging effects on human health and the environment
- Recently, the WHO has recommended the re-introduction of DDT for disease vector control
- The EPA is the regulatory body in Ghana with the mandate to register pesticides for use in the country

### Status of DDT in Relation to the Pesticides Control and Management Act, 1996 (Act 528)
- The Act stipulates that ‘no person shall import, export, manufacture, distribute, advertise, sell or use any pesticide in Ghana unless the pesticide has been registered by the EPA in accordance with this Act’
- Section 2 of the Act, however, stipulates that the Agency may authorise the importation of an unregistered pesticide in the event of national emergency

### Alternative to DDT
- EPA has approved four products for residual spraying purposes
  - Bistar 10WP (Bifenthrin)
  - Icon 10 CS (Lambda cyhalothrin)
  - Delet 2.5 EC 9Deltamethrin
  - Vectorguard 40 WP (Pirimiphos methyl)
- These products have been tried and tested by the WHO and recommended for residual spraying against mosquitoes

### Possible Problems associated with DDT use in Ghana
- **Environmental Problems**
  - It is persistent in the environment
  - Effects of such pesticides will increase if appropriate measures are not taken to control its use
- **Possible Misuse in Agriculture**
  - Banned in 1985
  - DDT is however very cheap compared to other pesticides and also known to be very effective against a broad range of insect pests
  - These properties of the chemical will make it very attractive to farmers to misapply on their crops

### CONCLUSION
- Based on the above, EPA recommends that the Government of Ghana should resist any external pressures to re-introduce DDT into the country
  - Since equally effective alternatives have been approved for use in the country
MALARIA AND DDT USE - NIGERIAN EXPERIENCE
PRESENTED
BY
EUGENE O. ITUA
SUSTAINABLE RESEARCH & ACTION FOR ENVIRONMENTAL
DEVELOPMENT (SRADev)

AFRICAN CSOS AND EXPERTS MEETING ON DDT,
NIGERIANS IN NIGERIA,
• Over 99% of Nigerians living in Nigeria have malaria
cases in their blood.
• Malaria is the most widespread tropical disease.
• Malaria is a major cause of death in the world, accounting for
3 million deaths annually.

INTRODUCTION
• Nigeria is home to a population of
150 million people.

MALARIA IN NIGERIA
• Malaria is highly endemic in Nigeria and its
remains one of the leading causes of morbidity
and mortality in the country.
• Malaria accounts for 40% of disease burden
reported at the public health facilities.
• It accounts for 30% of all childhood deaths and
is associated with 11% of maternal deaths.
• The burden of disease of malaria on the
Nigerian population is self-evident.

MALARIA IN NIGERIA,
• Over 99% of Nigerians living in Nigeria have malaria
cases in their blood.
• Malaria is the most widespread tropical disease.
• Malaria is a major cause of death in the world, accounting for
3 million deaths annually.

FIGHTING MALARIA
• Nigeria is deeply committed to making progress
toward the achievement of the Millennium
Development Goals and it recognises the fact
that, without firm efforts to control malaria,
achievement of the targets related to child
mortality, maternal mortality, and reducing the
burden of communicable disease will not be
possible.
• Malaria therefore constitutes a significant
development challenge for Nigeria.
• Previous efforts to control malaria in Nigeria have
not led to a sustained reduction in the burden of
mortality and morbidity pre-1998.

FIGHTING MALARIA,
• In 1998 the Roll Back Malaria (RBM) Partnership was
launched in Nigeria as a dynamic movement
involving all stakeholders affected by or concerned
with malaria.
• Nigeria (in 1998) participated in pre-testing situation
analysis instruments.
• Roll Back Malaria (RBM; www.rbm.who.int), a global
partnership that includes the WHO and the United
Nations, was launched in 1998, and endorsed two
years later (Abuja Declaration) by African heads of
state in Abuja, Nigeria, with a commitment to halve
the number of deaths from malaria worldwide by
2010.
Measures have been undertaken in the country to develop a dynamic national RBM movement. These have involved all levels of the political structure and a broad range of partners.

A National Malaria Control Committee has been inaugurated to play a pivotal role in advocacy, social mobilization and implementation of RBM in Nigeria. This has included expertise in the various areas and key representatives from the civil society.

Four sub-committees were inaugurated to look into key areas of RBM— including publicity and community mobilization; case management and drug policy.

The Federal Ministry of Health has accorded malaria control as one of its priorities in the current health sector development programme.

Nigeria has reduced taxes and tariffs on bed nets from 50% to 5% and waived taxes and tariffs on insecticides.

Manufacturers have committed to RBM and given assurances of their capacity to manufacture 10,000 bednets per month to meet the country’s needs.

A stakeholders and partners Round Table meeting was held in January, 2001. It adopted a six-months intensive plan which included the development of a medium to long-term national strategic plan.

**SUPPORT TO THE NATIONAL MALARIA PROGRAMME (SuNMaP), NIGERIA—A DFID FUNDED PROJECT 2008-2012**

**OUTPUTS**

+ Improved National, State and LGA level capacity for policy development, planning and coordination.
+ Effective harmonisation of all agencies’ support for the malaria subsector at federal, state and local levels.
+ Improved population coverage of effective measures for the prevention of malaria.
+ Improved access of the population to effective treatment for malaria.
+ Increased community awareness and demand for effective malaria treatment and prevention.
+ Operational research into key areas of prevention and treatment provides the evidence base for more effective strategies.

**LATEST REPORT**

The Abuja targets have not been achieved.

Reports (2005) show that

+ only 11.3% of children under 5 years are able to access currently recommended treatment;
+ only 8.4% of pregnant women and children benefit from ITNs; and
+ 9.4% of pregnant women at risk of malaria have access to presumptive treatment.
+ Malaria is a leading cause of death among children in the country.

**VECTORS CONTROL USING THE DIRECT ATTACK METHOD:**

Although some studies have reported the presence of DDT-resistant mosquitoes, it is still one of the most effective and economical forms of insecticide in the control of malaria.

Environmental laws are leading towards the total ban of the use of DDT.

Due to its persistence in the environment and its effect on the ecosystem, it is regarded as a persistent organic pollutant.

Nigeria is signatory to

- Stockholm Convention on Persistent Organic Pollutants (POPs);
- the Rotterdam Convention

Thus the Nigeria government policy is that DDT use is banned. There is no permit to use like about 18 African Countries.
ALTERNATIVES TO DDT USE IN NIGERIA

- Recognize the home as the first point of treatment and strengthen home care with training and information packages for easy use of antimalarial drugs.
- Recognize the role of patent medicine vendors, improve their knowledge, encourage better practice and monitor the quality of their products.
- Ensure continued monitoring of the efficacy of first-line antimalarial drugs.
- Integrate micronutrient supplementation in malaria case management in collaboration with reproductive health and others.
- In an integrated disease control approach, village health workers and traditional birth attendants will be involved with malaria control in the context of other health care programmes.
- Improve regulation in collaboration with the National Agencies for Food Drugs and Control and intensity inspection of drug providers’ and suppliers’ premises.
- Reducing duty on imported antimalarial drugs which cannot be manufactured in Nigeria.

INSECTICIDE TREATED NETS

- While insecticide treated nets have a place in malaria control, they often get torn.
- They only protect one person at a time.
- People often don’t use them,
  - because the insecticide irritates their skin – or
  - they forget
  - …don’t have enough for every family member … or
  - are still doing homework or housework when mosquitoes arrive
  - … kick them off when it gets too unbearably hot under the net to sleep
- Sleeping under a bed net is nearly impossible during cold African nights. Like the net anyway, and you get heat rashes all over your face and body, most locations have no electricity to power fans or air conditioners. Even in cities like Lagos power outages are frequent, rendering fans and AC useless. “Even if you have a generator, you don’t want to put it on throughout the night, for fear of carbon monoxide poisoning,” says Omololu Faboki, a journalist in Nigeria.
- DDT IS USED ILLEGALLY

(SRADev)’s Efforts

- We support components to holistic approaches in fighting malaria:
  - epidemiological surveillance that allows early detection of malaria cases and prompt medical treatment;
  - community participation to improve home and water sanitation levels and eliminate mosquito larvae sites in streams and standing water; bed nets treated with insecticides other than DDT; and
  - improved medical treatment and drugs.
- The challenge ahead is to provide many more nations with increased capacity to combat malaria and to assist those nations now using DDT to move toward the adoption of safer alternatives.
- SRADev is willing to build capacity and actively involve in these issues and serve as the arrowhead in Nigeria.
- We believe this meeting will serve as an opportunity for adequate preparation in this direction.

SUSTAINABLE RESEARCH & ACTION FOR ENVIRONMENTAL DEVELOPMENT (SRADev)

- For now much has not been carried out from our end on DDT.
- It is a potential issue of interest particularly as no NGO in Nigeria is presently doing anything on DDT and has carried out specific activities beyond academic research.
- At best, SRADev
  - have only carried out sampling of DDT in breast milk among rural pregnant women in Abeokuta, Ogun state.
  - Written a few articles on the Nigeria media and newsletters in the past on DDT, e.g., DDT; WHO - Clean Bill of health?, Malaria is a scourge but DDT is not the cure and DDT conspiracy.
- Through the EDI participating on the UNEP/WHO human milk survey (Moms and POPS-Project, MaPP) under the Stockholm Convention global monitoring Plan in Nigeria.

THANK YOU
**Malaria control challenges in Uganda**

- Poor Treatment Seeking Behavior
- Limited awareness and lack of capacity to recognize Severe Malaria
- Lack of compliance with treatment regimes
- Lack of up-to-date information/material for the case management at health facilities

**Challenges Cont’d**

- Limited & inadequate use of insecticide-treated mosquito nets (ITNs)
- Lack of capacity for the epidemic preparedness and response
- Lack of compliance in the indoor residual spraying (IRS) intervention

**DDT use in Uganda**

- First used between 1959-1963
- Subsequently stopped in 1980’s
- Debate for re-introduction began in 2004
- In June-July 2005, an EIA was commissioned
- In early 2006, a study on the effects of DDT was done

**DDT use Cont’d**

- In November 2006, a public hearing was conducted
- On 22nd December 2006, NEMA okayed the use of DDT
- In April-May 2007, DDT spraying was done in the districts of Oyam and Apac
- Between June-July 2007, a court injunction on DDT spraying was granted.
AGENDA-TANZANIA

DDT-Malaria Campaign in Tanzania
The campaign by AGENDA involved production of awareness materials, organizing meetings with relevant government institutions and individuals, media briefings, trainings on POPs health and environmental effects and existing alternatives (DDT included).

Production of Awareness Materials
AGENDA produces posters (A2) size 500 copies each in English and Kiswahili, highlighting the harmful effects of re-introducing DDT for malaria control. It insisted on alternatives to DDT and community participatory approach for mosquito control as a sustainable way for malaria vector control.

Also produces posters (A3) size 500 each in English and Kiswahili, explaining environmental and health impacts of DDT, the way malaria is transmitted and breeding ground for Anopheles mosquito. It also highlighted reasons for increased
malaria in Africa, Tanzania malaria situation, prevention options and proposed approach including some few recommendations. These materials and DDT fact sheets have been disseminated to government ministries and institutions, agricultural extension officers working with farmers, NGOs/CSOs, research institutions, some private companies and media. Also posters distributed to some other partners outside the country.

**Media Coverage**

- AGENDA has been developing news articles on DDT and other POPs and disseminate through various newspapers.
- AGENDA has also held Press conferences every year (since 2005) during the commemoration of Africa Malaria Day (25th April) and World Environment Day. Mostly the information covered re-introduction on DDT and education on Malaria.
- AGENDA has held a series of radio and TV interviews on the National Radio, Tanzania Broadcasting Corporation (TBC-Taifa/PRT) in a 15minutes programmes, Urithi Wetu (our Heritage) part one on 1st April 2008 (DDT, our health and environment). Urithi Wetu (Our Heritage) part two was aired on 8th April 2008 and a TV interview on 2 May 2008. AGENDA also held interviews with newspaper in form of Q&A covered by The Guardian on 7th April 2008 and news article on Majira on 24th April 2008.

**Appeal to the Government**

AGENDA drafted a letter that was then signed by 44 environmental and health related NGOs/CSOs (36) and individuals (8) from 18 (out of 21) Tanzania mainland Regions. The letter was submitted to the ministry of Health and Social Welfare (April 2008) with other related materials.

1. **Malaria Survey**

The survey was conducted and completed in September 2007 and produced survey report.

- The survey identified trends of malaria prevalence in different periods and places in Tanzania,
- Malaria curative measures available in the country,
- Vector control measures in place,
- Alternatives to DDT
- Analyzed different non-spraying control interventions and their success stories.
Key Findings

*Trend and Prevalence*

93% of population in Tanzania is at risk of malaria (results into up to 125,000 deaths)

25% of the country population is considered to live in malaria epidemic prone areas (8% live in fringe highlands and Rift Valley, 17% live in Semi arid districts)

About 26 districts are classified as malaria epidemic prone areas

Estimates for overall number of cases of malaria were between 14 – 19 million cases/annually (95% of cases of malaria are produced by *Plasmodium falciparum*, and the rest is caused by either *Plasmodium malariae*, *Plasmodium ovale*, and *Plasmodium vivax*)

There has been 8 epidemic incidences in Tanzania between 1982-2006 (resulted into more than 2,524 deaths)

**Incidence of Epidemic Occurrences in Tanzania from 1982 to 2006**

<table>
<thead>
<tr>
<th>Location</th>
<th>Period</th>
<th>Cases</th>
<th>Deaths</th>
<th>Predisposing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanang and Babati Districts (Manyara Region)</td>
<td>November 1982 – June 1983</td>
<td>108,243</td>
<td>334</td>
<td>Non-immune population moving to high transmission areas for labour</td>
</tr>
<tr>
<td>Lushoto-Ubiri village (Tanga)</td>
<td>March 1986 – April 1986</td>
<td>67</td>
<td>27</td>
<td>Increase in breeding sites created from limestone</td>
</tr>
<tr>
<td>Location</td>
<td>Date Range</td>
<td>Incidence</td>
<td>Rate (%)</td>
<td>Cause</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------------</td>
<td>-----------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mvumi (Dodoma)</td>
<td>March 1987 – April 1987</td>
<td>713</td>
<td>93 (13%)</td>
<td>Heavy, prolonged rainfall in January (330 mm annual, mean 300-400mm)</td>
</tr>
<tr>
<td>Babati District (Manyara)</td>
<td>January 1987 - August 1987</td>
<td>70,721</td>
<td>63</td>
<td>(0.09%) Lack of anti-malaria drugs in health facilities during transmission season</td>
</tr>
<tr>
<td>Korogwe District (Tanga)</td>
<td>February 1987 – March 1987</td>
<td>1122</td>
<td>40</td>
<td>(3.6%) Movement of people to high transmission areas for rice irrigation</td>
</tr>
<tr>
<td>Babati District (Manyara)</td>
<td>January 1997 – June 1997</td>
<td>Not Known</td>
<td>227</td>
<td>Unusually heavy rains and lack of anti-malaria drugs</td>
</tr>
<tr>
<td>Muleba District (Kagera)</td>
<td>October 1997 – March 1998</td>
<td>133,866</td>
<td>1740</td>
<td>(1.3%) El-Nino rains, lack of anti-malaria drugs and ineffective drugs-Chloroquine</td>
</tr>
<tr>
<td>Muleba and Karagwe</td>
<td>2005 and 2006</td>
<td>227</td>
<td>227</td>
<td></td>
</tr>
</tbody>
</table>


- During the survey some experts reported that
  - There was no routine registration of deaths in Tanzania and method like the Demographic Health Survey (DHS) do not produce data on cause specific mortality
  - Sometimes malaria cases reported from districts are randomly estimated when demanded by the National Chief Medical Officer under the Ministry of Health and Social Welfare (MOHSW)
    - The NMCP estimates that only about 500 facilities out of approximately 5,000 have a working microscope (70% of febrile illness is seen in primary level facilities where there is usually no microscope)
- Healthcare Seeking Behaviour
  - Children who were sick with malaria taken to a health provider 47% of the time (DHS 2004/05)
  - The NMCP reported that more than 50% of all malaria deaths cases involve the patients who attended formal health services during their final stages of illness.
  - A traditional illness called degedege which is associated with convulsions and correlates closely with severe malaria presents a special problem
    - The first response to degedege is to seek help from a traditional healer
Factors relevant for health seeking behaviour includes

- Lack of knowledge; unavailability of health facilities especially in rural areas; lack of drugs and lack of money to pay for preventive or treatment costs

Malaria curative measures available in the country

Malaria case management is based almost on chemotherapy, mainly using of antimalarial drugs (13 Mono therapies and 1 Combination) were registered

- Tanzania Food and Drug Authority (TFDA): the primary causes of resistance to malaria medicines are
  - Improper administration, Use of poor quality and substandard antimalaria medicines, and Compliance of users
- WHO reported that, the problem of counterfeit drugs in African countries is estimated to be 30% which has contributed to the number of malaria deaths in the continent (The problem of counterfeit drugs in Tanzania is estimated to be 90%)
- Coartem® during introduction was US$2.40 (WHO-negotiated price for an adult dose in the public sector)
  - the price has been rising and as of 2007 the retail price was reported to be between US$ 8 – 15 in private sector

Vector control measures in place

- Prevention and Control Measures (National Guidelines for Integrated Malaria Vector Control)
  - Methods of Reducing Human Contact
    - Mosquito nets and insecticides treated mosquito nets (Various initiative to provide ITNs in place e.g. Global Fund to fight Aids, TB and Malaria(GFATM)) – *This is by far the most important vector control method available and in use in Tanzania*

There are four types of bed nets used in Tanzania which includes regular bed net that is not impregnated with an insecticide; bed net that is impregnated with an insecticide every 6 months (ITN); long lasting insecticidal nets (LLIN) that may last 3-5 years without re-impregnation and up to 7 years as far as the component material is concerned; and bed nets that is impregnated with an insecticides every 6 month plus an added resin that would make it long lasting. The chemical used to impregnate nets is a pyrethroid insecticide.

Other methods include: House protection with screening of windows; eaves and doors; Use of repellents and Fumigant insecticide dispensers (form of mosquito coils and, in urban areas, electrically heated dispensers)

Methods of Reducing Vector Density (Lavicidial scheme)

- Use of Larval control such as Organophosphates, Microbial insecticides (Biocides) and Insect Growth Regulators (IGRs)
Lavicidial scheme is the second approach used by the NMCP for vector control. A pilot project in Dar es Salaam funded by United States Agency for International Development (USAID) and Japan International Control Agency (JICA), as well as the Municipal council was in implementation process in which 15 wards in three districts of Dar es Salaam were to be covered in the baseline survey. The initial survey results show that the drainage system in Dar es Salaam is not functioning effectively, as a result Anopheles breeding sites are produced, which inevitably results in an increased malaria cases in the surrounding areas. The project adopted two strategies i.e. cleaning of existing anti-malaria drains and community mobilization.

During the interview, personnells from JICA expressed concerns on the sustainability of the project in the future after it has been handed to local authority (municipals) unless municipals integrate the budget for the community activities into their municipal plans.

National guidelines for integrated malaria vector control emphasize on the environmental management intervention but is not practiced in many places in the country.

- Methods of Increasing Adult Vector Mortality
  - Indoor Residual Spraying (IRS)
    - According to the National Guidelines for Integrated Vector Control, in Tanzania DDT is recommended as the first line insecticides for IRS
    - Second line insecticides recommended for IRS is Synthetic Pyrethroids, followed by Organophosphates (Malathion, Fenitrothion) and Carbamates (Propoxur, Bendiocarb)

**DDT Use in Tanzania**

Dichloro-Diphenyl-Trichloroethane (DDT) was introduced in Tanzania by the British colonial government in 1946 for residual spraying on the walls inside houses. It was used together with other interventions in 1960s. After the ban of DDT in 1972 by US-EPA, the Government of Zanzibar banned the use of DDT for malaria control programmes in 1988, whereas in Tanzania Mainland, the Government order to prevent the formulation and use of DDT for agriculture purposes was made in 1997. The decisions were solely based on effects of DDT to human health and the environment. However, the use of DDT was still restricted for use in disease vector control during epidemics only.

In May 2006, the Government of Tanzania announced its intention of lifting the ban of DDT for malaria vector control. According to NMCP, 26 malaria prone epidemic districts, which includes Muleba, Karagwe (Kagera), Lushoto, Hanang, Same, Babati, Ngorongoro, Hai, Karatu (Northern highlands), Dodoma Rural, Mpwapwa, Kongwa (Cetral Zone), Njombe, Ludewa, Makete, Iringa Rural, Kilolo, Sumbawanga, Chunya, Mufindi, Rungwe, Songea, Mpanda, Nkasi and Kyela (Southern Zone) was to be sprayed with DDT from January 2008.
The Ministry of Health and Social Welfare (MOHSW) emphasized that an Environmental Impact Assessment (EIA) was to be conducted to identify and assess the risks with a view to providing recommendations on the way forward to the MOHSW.

Later on, the NMCP reported that DDT spraying for IRS was to start September 200 in Muleba and Karagwe Districts. Moreover the Hai District Health Officer in Kilimanjaro Region reported that the district was to start spraying DDT in September 2007 where education on how to use DDT was to be provided to civilians.

**Alternatives to DDT and analyzed different non-spraying control interventions and their success stories**

- Community wide use of insecticide treated nets
  When a large proportion of the population in a community is protected by ITNs, there may be a significant reduction of vector survival, density and sporozoite rate (“mass impact”) and hence of malaria transmission
- Research Programmes and Projects on Vector Control
  The Ifakara Health and Research Development Centre (IHRDC) focus upon mosquitoes and Anopheles vectors of malaria in particular through its Entomology unit. The long term goal of the unit is to develop, evaluate and promote the delivery of malaria vector control interventions and complementary methodological tools that are affordable and effective in African settings.

1. Programme on Malaria vector and parasite ecology;
   - Behavioural and ecological determinants of gene flow in African malaria mosquitoes
   - Male mating competitiveness in *Anopheles Arabiensis*
2. Tools for malaria epidemiology, surveillance and control;
   - Spatial analysis of impact of insecticide-treated nets for malaria control in Tanzania;
   - Malaria transmission intensity and mortality burden across Africa (MTIMBA);
   - Entomopathogenic fungi as biocontrol agents for malaria vector mosquitoes;
   - Human-biting patterns of malaria vectors and optimization of operational sampling methods for measuring malaria transmission intensity in Dar es Salaam;
   - Integration of earth observation-derived water resources products into malaria control initiatives in Tanzania; and
   - Disruption of malaria transmission by chemical manipulation of Anophe-line olfactory responses community empowerment for malaria control in Africa
3. Public health systems development;
   • The Dar es Salaam Urban Malaria Control Project
   • Community empowerment for malaria control in Africa

**Lesson Learnt in Tanzania**

The Zanzibar Government reported that the incidence of malaria in Zanzibar had fallen significantly from 54% in 2003 to 31% at the end of 2005. This was the result of proper diagnosis and treatment, and the use of treated insecticides nets in which the US government has given more than 200,000 ITNs to pregnant mothers and children younger than five years.

In July to September 2006, Zanzibar effectively implemented IRS using a Synthetic Pyrethroid Lambda-Cyhalothrin (ICON 10% WP). The first IRS round reduced vector density and malaria incidence successfully, morbidity decreased from 39% to less than 10%. Second IRS round was done between January and March 2007, judging from the results of the first IRS round, more dramatic results are expected. The spraying campaign is focusing only on those mosquitoes on walls inside people's home.

This anti-malaria initiative in Zanzibar was reported to cost at least US$ 2 million and reached 240,000 homes, or 90 percent of all homes on the island according to the government. During the African Malaria Day on 25th April 2007, the Zanzibar government reported that there are few or no cases of malaria in many hospitals in the island.

Moreover, the minister reported that the island’s success in the battle against malaria has been contributed to increased awareness in seeking early treatment, accurate diagnosis and combination therapy. It is currently estimated that 82% of Zanzibar children below the age of five, and 62% of pregnant mothers sleeps under ITNs.

**Recommendations**

There is an urgent need to have a demonstration project in malaria prone areas that will include multiple safe environment strategies and involve community participation to manage mosquito densities and enhance control of malaria. The demonstration project will help the government to integrate and prioritise the strategies into the nation policy and also help other stakeholders to incorporate in their malaria control activities.
Alternatives to DDT - Experiences with alternatives to DDT

Pyrethrum Board of Kenya

A Presentation by the Pyrethrum Board of Kenya to the African CSOs and Experts Meeting on DDT.

Mbezi Garden Hotel, Dar es Salaam, Tanzania, 6-8 April 2009.

By Kefa S. Sum
Pyrethrum Board of Kenya
P.O. Box 420
Nakuru
KENYA

PYRETHRUM AS AN ALTERNATIVE TO DDT IN PUBLIC HEALTH:
A CASE FOR USE OF PYRETHRUM PRODUCTS IN IRS AND AS LARVICIDE AGAINST MALARIA VECTORS

INTRODUCTION

The Malaria Problem

Global
- 110 million cases estimated annually
- 80% of these occur in Africa
- 90-95% of related deaths occur in Africa
- Results in large macro-economic losses by affecting labour productivity, land use, school attendance, household expenditure etc (WHO 1991)

Kenya
- 20 million Kenyans exposed to stable malaria
- 8.5 million Kenyans at risk of epidemic malaria
- 3.5 million children under 5 years
- 30% out patient attendance
- Kills 26,000 children <5 years

DDT-Dichlorodiphenyltrichloroethane

- An organochlorine insecticide successfully used in IRS the 50’s and 60’s
- Discovered by Paul Muller - awarded Nobel Peace Prize in 1948
- Has many documented side-effects on human and the environment
- It is classified among the POPs, but given exemption for use in vector control where viable alternatives do not exist
- The search for DDT alternatives is therefore a priority

THE PYRETHRUM PRODUCTS FOR USE AS DDT ALTERNATIVES IN IRS AND LARVICIDING

PBK: Pyrethrum Board of Kenya

- A Government of Kenya state Corp. with responsibility to regulate production, processing and marketing of pyrethrum products on behalf of pyrethrum farmers.
- PBK is a member of the Kenya Government Committee on the National implementation Plan on POPs (DDT alternatives search)
- Pyrethrum:
  The pyrethrum crop, Chrysanthemum cinerariaefolium is a daisy composite plant, whose insecticidal properties have been recognized and exploited for over 100 years.
- Pyrethrum is grown mainly in Kenya, Tanzania, Rwanda, Tasmania and China.
A TYPICAL PYRETHRUM CROP

THE a.i. PYRETHRINS

- They are organic esters formed by the combination of two carboxylic acids and three keto alcohols.

PROPERTIES
- Rapid knockdown against mosquitoes
- Low mammalian toxicity
- Biodegradable in environment
- Less problems with resistance development
- Repellent and flushing effect

THE PRODUCTS

PYMOS® 0.6EC

PROPERTIES
- A pyrethrum mosquito adulticide product for Indoor Residual Spraying (IRS) and space spray against vectors.

Mode of Action
- Pymos as an IRS - targets resting sites (wall and ceiling).
- Mosquitoes contact PYMOS during or after spraying - resulting in rapid KD and deaths
- Some mosquitoes are deterred or repelled.

Biological efficacy (laboratory conditions)

PYMOS gave rapid knockdown at the rate of 60mg a.i/m² or 1 litre to cover 100m²

PYMOS residual protection

In WHO huts.

% kill of Pymos (Pyrethrum) against Anopheles mosquitoes over six month period
**PYMOS™ TRIAL UNDER FIELD CONDITIONS**

**STUDY AREA**  
Kosirai Division, 270km²  
Nandi North District

**AREA**  
43,148

**POP.**  
21,804

**STRUCTURES**

---

**Specific Objectives**

- To determine the effect of PMOS IRS on the prevalence of malaria prevalence vectors.
- To determine in-house residual efficacy of PYMOS in the sprayed houses.
- To determine the relative acceptability and perception of PYMOS by the user community.

---

**SPRAYING EXERCISE**

- Conducted between April-May 07
- 24 spray teams using Gloria pumps
- PYMOS sprayed at 2 litres/200m² (60mg a.i./m²)
- Total of 17,482 house units/structures
- About 11,000 litres of PYMOS used

---

**TECHNICAL EFFICACY MONITORING AND EVALUATION**

**Malaria prevalence**

- Monitored in two designated health units i.e. Mosoriot (PYMOS sprayed area) and Kilibuoni (Control-sprayed with ICON).
- Vectors- pyrethrum spray catches, exit window traps, contact wall bioassays.
PYLARVEX 0.5 EC

A Pyrethrum Product containing 0.5% pyrethrins (w/v) for control of mosquito larvae

Mode of Action:

Spread rapidly to form an invisible layer over the sprayed water mass killing the larvae on contact and interfering with the spiracular breathing mechanism

PYLARVEX 0.5 EC

Pylarvex effected rapid knockdown and kill of mosquitoes.

Fig. 4: Mosquitoes recovered after Pyrex RS

Fig. 5: No. confirmed +ve

Fig. 6: No. examined

Fig. 7: Effect of PYLARVEX 0.5 EC on mosquito larval mortality

% +ve

No. confirmed +ve

% Knockdown

Time (min)

% Mortality

KD = 6.53 minutes

Median Remaining

Fig. 3: Mosquito Control

Fig. 2: Weekly count and confirmed malaria cases in unsprayed villages in Koidu 1988

Fig. 1: Number of Patients Examined and Malaria Positivity Rate in Koidu Division (PYRINIS RS)
CHALLENGES TO ADOPTION OF LOCALLY DEVELOPED DDT ALTERNATIVES

- Lack of funds to undertake large scale demonstrations and promotions.
- Stringent regulatory requirements e.g. WHOPES which are expensive
- Donor preference of other products over the local products

CONCLUSION

- Pyrethrum products have good bio-efficacy against mosquitoes, are safe and available for use.
- They are suitable for integrated vector management through IRS and source reduction.
- The products should be given serious consideration as a local solution to DDT in the fight against malaria.

THANK YOU!
Demonstrating and Scaling-up of Sustainable Alternatives to DDT in Vector Management (DSSA - Global Programme)


Objective of the program

- Objective: The DSSA-Global Programme aims at the protection of human health and the environment through the reduction of emission of DDT into the global environment.
- How: Decreasing the use of DDT through introduction, demonstration and scaling-up of sustainable alternatives to DDT in disease vector management.

Linkage with SSC

- The projects executed within the framework of the DSSA-Global Programme are part of the Business Plan of the Secretariat of the Stockholm Convention (SSC) to promote a global partnership for the development and deployment of alternative products, methods and strategies to DDT for disease vector control.

Long-term goal of the DSSA – Global Program

- To contribute to a re-formulation of the WHO Global Malaria Program in order to promote integrated vector borne disease control interventions while at the same time eliminating the application of DDT and reducing the use of other chemicals.

1997: WHA Resolution 50.13

Members States “to take steps to reduce reliance on insecticides for control of vector borne diseases through promotion of integrated pest management approaches in accordance with WHO guidelines…”

WHA - World Health Assembly: WHO’s decision-making body.

Use of DDT for malaria vector control

The use of DDT for malaria control in the WHO Africa Region the year before signing of the Convention (2000) and 2 years after the Convention entered into force (2006).
Why is DDT use still increasing in the world?

- Vector control programs with Indoor Residual Spraying (IRS) are fast expanding both at country and at regional levels.
- This expansion is not followed by an appropriate IVM capacity building:
  - Technical expertise for policy making and planning
  - Sound entomological surveillance systems to predict when and where DDT should be used and when and where not
- Several countries are still spraying DDT indiscriminately in the open air rather than targeted through IRS.
- Countries and aid donors seeking to return to DDT spraying as Indoor Residual Spraying (IRS) as a cheap and quick way to cut malaria incidence.

What needs to be done?

Ensure:

- Global strategy (Business Plan) in place to trigger significant action and to develop/deploy alternative approaches to DDT.
- Countries receive funding and technical support to develop their capacities to implement IVM.
- Regional alternatives to DDT Projects demonstrating cost-effectiveness of alternatives to DDT are implemented quickly.

Conference of the Parties Stockholm Convention (Dakar, 30 April - 4 May 2007)

Parties called for:

- Increased research into alternatives to DDT.
- Increased promotion of success stories.
- Improved sharing of experiences.

Many delegates pointed out that, seeing the urgency of the situation, there is need for adequate funding, clear plans that include participation of the civil society.

Demo Project: Malaria control in Mexico and Central America in the context of elimination of DDT use

- Areas involved: highly malarial areas in 8 countries including Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.
- Executing agency: PAHO, national and local governments.
- Implementing agency: UNEP.
- Co-funding: GEF, Roll Back Malaria Initiative, Global Fund against HIV/AIDS, Malaria and Tuberculosis, PAHO and Countries.
- Total Budget: about 13.8 million US $ (GEF: 7.4 million)

Objectives Demo Project

- Demonstrate feasibility of integrated and environment-friendly methods for malaria vector control without the use of DDT.
- Assess the effects of these methods on malaria occurrence.
- Dispose stockpiles of DDT/POPs pesticides (137t).

Demo Project activities

Institutional changes at country and local level:
- No top-down ‘spray approach’ but decentralized participatory approach.

Prevention at community level:
- Environmental management at community level;
- Planting of trees with mosquito repellent properties;
- Focal treatment in “malaria houses” and neighboring contacts;
- Biological control with larvivorous fish;

At household/personal level:
- Environmental management at house level;
- Personal application of naturally available repellents;
- Personal hygiene;
- Use of Bednets;
- Awareness Raising & Education;

Control: traditional methods, including other chemical pesticides, but no DDT, focused treatment of malaria cases.

Disposal of 137 tons of POPs pesticides.
Demo Project: Summary of results

- At the country level
  - Malaria incidence decreased: proportion of cases in demonstration areas as a fraction for the whole countries changing from 3.1 to 1.5%
  - There were statistically significant differences between incidence decreases in demonstration and control groups (40% vs. 5%)
  - There were important differences among countries

- At the country level
  - The level of reduction by country demonstration area varies from 26.6% in Guatemala to 80.4% in Belize.
  - There were marked differences of case reduction fractions between to villages (some numbers are very small), but the overall pattern suggests an strong and evident improvement in malaria control.
  - There were important differences among countries

Demo Project: Summary of results (3)

- At the village level
  - Malaria incidence reduction: demonstration villages >> control villages
  - ~ 30% of annual cases (> 600) avoided in demonstration villages (vs. 17% in the total malarial areas) = high cost-effectiveness
  - reduction of malaria cases = avoiding loss of 10 person-years of work/yr.
DSSA - UNEP/WHO/GEF projects

Mexico & Central America 2003-2008

South East Asia & Pacific 2010-2015

Middle East & North Africa 2008-2013

Afro 2009-2014

Central Asia 2008-2014

India

DSSA - UNEP/WHO/GEF Research project with Duke University and others:
Malaria Decision Analysis Support Tool (MDAST): Evaluating Health, Social and Environmental Impacts and Policy Tradeoffs

Research Project 2009-2011
Integrated Vector Management for Malaria control in Malindi, Kenya

KEMRI/ICIPE MALARIA PROGRAM, MINISTRY OF HEALTH AND MUNICIPAL COUNCIL OF MALINDI

Malaria: A Global Challenge

- affecting poor countries the most
- a preventable and treatable disease
- a need for effective control programs
- the WHO has acknowledged this need and is investing in effective surveillance and control initiatives

Facts about Malaria

- 300-500 million clinical cases per year
- 80% of cases in Africa
- 1 million deaths per year
- 90% of deaths in Africa mostly young children and pregnant mothers
- Every 30 seconds a child somewhere dies of malaria

Source: WHO, Roll Back Malaria Initiative, 2000

DSSA – budget (US $)

- Anticipated GEF funding: 32.4 million
- Approximate Co-funding: 45.9 million

Total: 78.3 million

Thanks for your attention!

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WHO: Stephanie Guillaneux Guillaneuxs@who.int
SSC: Paul Whyllie PWhylie@pops.int

Secretariat of the STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPs)
• Vector control strategies involving insecticide-spraying and insecticide-treated bednets are very effective for killing *Anopheles* mosquitoes.
• Evaluations during the 1980's demonstrated that treated bednets reduce biting densities of mosquitoes but it was frequently observed that there was no overall reduction in malaria prevalence. Thus, questions remained about the efficacy in terms impact on disease.
• WHO/TDR sponsored large-scale trials of bednets at four sites in Africa convincingly demonstrated that treated bednets can reduce overall childhood mortality by up to 30% thus providing a foundation for developing policy to promote bednet use in Africa.
• Bednets will not eliminate transmission or substantially reduce the prevalence of infection in endemic areas

Effectiveness of current Vector Control Methods in Africa

Every year about 34,000 people die in Kenya from the effects of the malaria.
• The female *Anopheles* mosquito transmits the malaria pathogen, *Plasmodium falciparum*.
• Integrated Vector Management is one of the best alternative methods to conventional approaches to prevent diseases transmitted by insects.
• Adaptive management principles stipulate active participation of the communities

The Malaria Project objectives

Goal: To improve human health through integrated Vector Management in Malindi

- Enhance community empowerment in malaria and mosquito through participative and applicable training in respective techniques and decision making.
- Establishment and implementation of a distribution plan for bed nets to increase the bed net coverage to more than 80%.
- To enhance sustainability of the intervention.

Geographic sampling strategy

A total of 16 grid cells each measuring 1x1Km constituted the sampling frame (within urban and peri-urban)

Larval sites and households were selected from within grid cells.

Vector surveillance conducted weekly for both larvae and adults by Scouts

Main mosquito breeding areas in Malindi

- Unused swimming pools
- Blocked drainages
- Broken/ uncovered septic tanks
- Open water tanks
Swamps/ponds  Open wells

Discarded tyres/containers  Drainage overgrown with grass

Location of larval habitats and the distribution of Anopheles and Culex species

- An. gambiae s.s. is the predominant species found
- Other Anopheles species are An. arabiensis & An. merus
- Culicines: Ae. Aegypti, Cx. quinquefasciatus

Location of larval habitats and grid cells where Bti was applied

Mosquito control activities

- Personal protection; ITNs
- Mosquito scouts covering a septic tank
- Water management; clearing blocked drainages
- Larviciding of mosquito breeding areas

Larval Control using environmentally compatible biolarvicide (Bti)

- Bti application was applied intermittently from June - Dec 2006 and monthly thereafter

Culex larval Reduction = 74.58%

Anopheles larval Reduction = 55.11%

Anopheles spp Adult reduction = 24.02%

Culex spp adult Reduction = 75.43%
Paediatric admissions at Malindi District Hospital

Malaria cases declined by 28%. Malaria infections declined by 22.4%

Time-series models strongly suggest that the observed decline in malaria admissions was a result of malaria specific control efforts in the hospital catchment areas

Source: Okiro et al 2007

Impact of existing malaria interventions

• Scaling up interventions (ITNs, EM, Larval control) reduced malaria morbidity in under 5 children and adults (88 deaths prevented per year in the next 3 years).
• Bed net coverage increased from 15% in 2005 to over 60% in 2008.
• Enhanced community participation and built capacity at both community and at the household levels with the ability to generate and analyse entomological information for vector control interventions
• There was significant reduction in anopheline abundance as well as the control of nuisance-biting species. This fostered community support and satisfaction.

Challenges

• The challenge for the future is to develop additional effective tools for vector control and combine them logically, so that operational vector control can go beyond bed-nets and beyond DDT.
• Strengthening of basic vector surveillance capacities at the level of the District and national malaria control programs.
• The involvement of District networks for harmonization and coordination of malaria control with other stakeholders.
• Maintaining and sustaining the gains over time will be challenging, if the required technical skills and capacities are not quickly established at all levels.

Challenges

• Limited infrastructures, human resources, and lack of the technical skills to generate and analyse entomological information for selecting, planning, monitoring and evaluating vector control interventions

Integrated Vector Management

"Adaptive Management"

Mosquito Scouts

- Education
- Larval Control + Source reduction
- ITN/LLINs
- Vector Control Management
- Local Communities
- Drugs
- Vaccine
Thank you
International Influences to National Programmes: Policies and Funding

**Global Policy and Funding for DDT**

*Dr. Paul Saoke*

Executive Director

PSR-Kenya

Vice President

ISDE

---

How are international Policies and major malaria program funding affecting effective malaria control in Africa?

**Introduction**

- Malaria has been one of the ignored diseases in the world for a long time.
- Attention was re-focused at the Abuja meeting which bore the Roll Back Malaria program
- RBM has also been beset by limitations and had to change its goal to malaria control and prevention

**Main sources of Malaria funding**

- The Global Fund to Fight AIDS, Tuberculosis and Malaria
- Multilateral Funding agencies
- Bilateral aid
- Private Foundations and corporates
- The United States of America Presidential Malaria Initiative

**GFTAM**

- The Global Fund to Fight AIDS, Tuberculosis and Malaria Round 8 funding Board has approved 94 new grants worth US$2.75 billion over two years. The overall portfolio now totals US$ 14.4 billion and reaches 140 countries.
- The EU and UN are among those bodies which contribute to the global fund, along with national governments, the private sector and civil society

---

**Round 8 Malaria Funding**

<table>
<thead>
<tr>
<th>Country</th>
<th>Component</th>
<th>Component</th>
<th>Total Approved Funding</th>
<th>Total 5-Year Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burkina Faso</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$69,741,792</td>
<td>$81,746,556</td>
</tr>
<tr>
<td>Central African Republic</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$10,064,900</td>
<td>$40,089,470</td>
</tr>
<tr>
<td>Comoros</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$6,389,042</td>
<td>$16,251,570</td>
</tr>
<tr>
<td>Cote Divoire</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$153,987,523</td>
<td>$365,152,507</td>
</tr>
<tr>
<td>Cote Divoire</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$180,297,625</td>
<td>$233,251,932</td>
</tr>
<tr>
<td>Eritrea</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$148,412,305</td>
<td>$204,056,135</td>
</tr>
<tr>
<td>Ghana</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$35,653,118</td>
<td>$185,032,373</td>
</tr>
<tr>
<td>Kenya (Nairobi)</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$72,341,141</td>
<td>$133,737,652</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$6,570,884</td>
<td>$8,789,180</td>
</tr>
<tr>
<td>Malawi</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$10,190,822</td>
<td>$162,252,244</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$56,290,027</td>
<td>$139,485,243</td>
</tr>
<tr>
<td>Panafrican</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$5,627,313</td>
<td>$13,980,098</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$6,790,319</td>
<td>$12,439,244</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$77,580,006</td>
<td>$113,335,022</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$9,707,257</td>
<td>$15,964,634</td>
</tr>
<tr>
<td>South Africa</td>
<td>Malawi</td>
<td>Malawi</td>
<td>$70,886,472</td>
<td>$143,319,627</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>$999,333,388</td>
<td>$1,832,739,696</td>
</tr>
</tbody>
</table>
Comparisons in R&D funding for selected diseases in 2007

<table>
<thead>
<tr>
<th>Disease</th>
<th>Funding (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>1,083,018,193</td>
</tr>
<tr>
<td>Malaria</td>
<td>468,449,438</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>410,428,698</td>
</tr>
<tr>
<td>Diarrhoreal diseases</td>
<td>113,889,118</td>
</tr>
<tr>
<td>Leprosy</td>
<td>5,619,475</td>
</tr>
<tr>
<td>Rheumatic fever</td>
<td>1,670,089</td>
</tr>
</tbody>
</table>

Multilateral Funding agencies

Most notably the World Bank
In 2007, Nigeria received a credit worth $180 million for the WB even though the malaria program needed $780 million
The WHO also provides technical and financial assistance to the national malaria control programs.

Bilateral source

- Negotiated as agreements between countries
- DFID has committed over £6 billion over 7 years to the fight against malaria.

Foundations

- Clinton HIV/AIDS Initiative (CHAI), malaria price negotiations reduced the price of one ACT, an effective malaria drug, by 30% and reduced price volatility of artmesinin, the plant extract in ACTs, by 70%.
- a pilot subsidy on ACTs in Tanzania which reduced the price in targeted areas by 95% and increased uptake by approximately 45% for people of all ages - 62% for children under 5

Funding for malaria

- Diagnostics: 0.3%
- Vector Control: 9.3%
- Malaria Research: 24.1%
- Research: 7.2%
- Drug: 45.7%
<table>
<thead>
<tr>
<th>Funding of DDT for IRS</th>
<th>Challenges in funding alternatives to DDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The PMI is the main funder of DDT for IRS in Sub-Sahara Africa.</td>
<td></td>
</tr>
<tr>
<td>- Nearly $10 million allocated for &quot;indoor residual spraying,&quot; including DDT, in Mozambique, Ethiopia and Zambia</td>
<td></td>
</tr>
<tr>
<td>- Some $20 million will be used to finance indoor spraying with DDT and the other 11 insecticides authorized by the World Health Organization (WHO).</td>
<td></td>
</tr>
<tr>
<td>- Funding of DDT alternatives is a major challenge today.</td>
<td></td>
</tr>
<tr>
<td>- The DDT business plan did not have major funding agencies involved</td>
<td></td>
</tr>
<tr>
<td>- The GFTAM has not incorporated the principles of the SC in its funding policies</td>
<td></td>
</tr>
<tr>
<td>- The Global economic crunch has resulted in a short fall of $3 billion for the GFTAM.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges cont.</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The GFTAM funding process is equally too complicated and exhibits bureaucratic processes making it too long.</td>
<td></td>
</tr>
<tr>
<td>- The GFTAM peer review process may be prejudiced by conservatives views and approaches.</td>
<td></td>
</tr>
<tr>
<td>- Only one project involving Madagascar, Ethiopia and Eritrea has been funded by GEF to particularly address alternatives</td>
<td></td>
</tr>
<tr>
<td>- The current funding levels for malaria control indicates good progress in declining malaria morbidity and mortality in some countries like Kenya, Malawi, Rwanda and Zanzibar.</td>
<td></td>
</tr>
<tr>
<td>- In Tanzania, beginning in mid-December 2005, the PMI distributed 130,000 long-lasting bed-nets, more than doubling the coverage rates of pregnant women and children on Zanzibar and Pemba Island.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conclusions cont.</th>
<th>Paul Herman Muller</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The number of confirmed malaria cases on Pemba Island dropped 87 percent from January to September 2006 to 1,570--down from 12,531 in 2005.</td>
<td></td>
</tr>
<tr>
<td>- There is an urgent need to find ways of stimulating GEF funding for DDT alternatives projects.</td>
<td></td>
</tr>
<tr>
<td>- NGO involvement in the UNEP/GEF/WHO global DDT alternatives project.</td>
<td></td>
</tr>
<tr>
<td>- There is an urgent need to find ways of stimulating GEF funding for DDT alternatives projects.</td>
<td></td>
</tr>
</tbody>
</table>

Paul Herman Muller
DDT and the Stockholm Convention-PAN Germany

African CSO and Experts Meeting on DDT
Dar es Salaam, Tanzania, 6-8 April 2008

DDT and the Stockholm Convention
States on the edge of non-compliance

Findings of a PAN Germany study
published jointly with PAN Africa and PAN North America

Carina Weber, Executive Director

Goal of the Stockholm Convention (SC) with regard to DDT: Elimination

"With the goal of reducing and ultimately eliminating the use of DDT . . . ."

Almost half a decade since the SC became effective in 2004
a gradual elimination of DDT should be perceptible!

However,
2003 - 2007 DDT use increased by 6 % annually!

Therefore the study raised two questions

1. Do all countries and/or players and financiers of malaria control programs comply with the requirements of the SC?

2. How should the process towards the global elimination of DDT be evaluated?

Sources of information to answer the questions

1. Publicly accessible data from the SC secretariat and WHO
2. Oral and email communication (governmental experts, industry, science, civil society; August 2008 - January 2009
3. Presentations and talks at the stakeholder meeting on the "Global Partnership for Developing Alternatives to DDT for Disease Vector Control" (Geneva, 3-5 Nov. 2008
4. Speeches and talks at a symposium of the German Federal Ministry for Economic Cooperation (BMZ) on chemical management on 16 Dec. 2008 in Bonn

Results at a glance

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viet Nam</td>
<td>2007</td>
<td>Thanks to consistent and successful malaria control programmes, no longer uses DDT</td>
</tr>
<tr>
<td>Tanzania</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Mexico</td>
<td>2002</td>
<td>Thanks to consistent and successful malaria control programmes, no longer uses DDT</td>
</tr>
<tr>
<td>Sao Tome and Principe</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Rwanda</td>
<td>2003</td>
<td>According to its own information no longer uses DDT</td>
</tr>
<tr>
<td>Senegal</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>India</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>China</td>
<td>2004</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Yemen</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Korea</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>China</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Taiwan</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Philippines</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2001</td>
<td>Does not want to use the insecticide in future</td>
</tr>
</tbody>
</table>

10 countries implemented the elimination of DDT use in malaria programs or, as the case may be, contributed to it noticeably.
Country such as Ethiopia and South Africa produce own formulations with imported DDT.

**Evaluation of Parties producing DDT**

- **China** produces DDT for malaria control (export) and for use in the production of alcohol; China wants to stop production in 2028.
- **India** produces DDT for vector control (domestic use, export) and for use in the production of alcohol.
- **North Korea** produces DDT for domestic use against mosquitoes and against pests in agriculture.

**Summary of the results**

- Only 10 countries implemented the elimination of DDT or contributed to it noticeably.
- 14 countries are on the edge of non-compliance.
- 6 countries used DDT illegally as the registration happened too late.
- 5 countries used DDT illegally as they used it without informing the Secretariat.

**Process is not sufficiently purposeful!**

**There is need for**

- more emphasis on compliance
- improved transparency about programs/projects promoted bilaterally and multilaterally
- concrete, binding and effective plans to reduce the use and production of DDT.
The German governmental policy on DDT

Two ministries actively involved:
- BMU (Ministry of Environment / lead)
- BMZ (Ministry for Economic Cooperation and Development)

Germany 3rd largest GEF funder
Since 2008 the only European representative in DDT expert panel

Both ministries aim at eliminating DDT asap.

German Minister for Economic Cooperation and Development Wieczorek-Zeul in a letter to PAN Germany December 2008: Germany, jointly with other European partners, especially from Scandinavia, supports the full ban of the production and use of DDT at the earliest possible time.

German governmental contributions
- elimination of obsolete DDT stockpiles
- generation of information and knowledge on alternatives
- capacity building to increase knowledge on alternatives
- new insecticide
- development and implementation of IVM approaches without DDT
- programs with DDT are only to be taken into account - as a ultima ratio and - if there is a time schedule for phase out

However: Is this fully implemented – also through GFATM?

(PAN Germany has not rejected a project yet.)

PAN Germany calls for a strong focus on non-chemical approaches in the German policy.

US government malaria aid
President’s Malaria Initiative (PMI)
Launched by former President George Bush in 2005 (under USAID)

5 billion dollars funding over 5 years committed in 2008

Goal: reducing malaria-related deaths by 50 % in 15 focus countries (Angola, Benin, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Rwanda, Senegal, Tanzania, Uganda, Zambia)

PMI’s approach
- Integrated package of prevention and treatment interventions;
- Strengthening health systems and maternal and child health services;
- Strengthening national malaria control programs and build capacity for country ownership of malaria control efforts;
- Close coordination with international and in-country partners.

PMI’s malaria control interventions
- insecticide-treated mosquito nets (ITNs),
- indoor residual spraying (IRS) with WHO-approved insecticides, including DDT
- intermittent preventive treatment for pregnant women (IPTp), and artemisinin-based combination therapy (ACT).
IRS in PMI’s programs

IRS:
26% of malaria funding in FY 06;
21% in FY 07,
23% in FY 08

Supporting IRS with DDT in Mozambique, Ethiopia, Zambia, Uganda

About 1 million dollars spent on DDT procurement in FY 08

Pesticide Management - IVM

- Overall ‘guidance’ document on ITNs and IRS,
- NetMark Project, which focuses on ITNs,
- IRS contract with RTI International (private contractor), with component on entomological monitoring,
- IVM project through another contract with RTI International project for pesticide management, ‘Environmental Monitoring and Capacity Building’

US Congress and malaria aid

- US Congress: passed Lantos- Hyde Act in 2008 formalizing the PMI’s role and committing funding
- Newly formed Congressional Malaria Caucus
- Input in malaria funding from several prominent committees in the Congress
- President Obama’s campaign speech promise: to "make the U.S. a global leader in ending deaths from malaria by 2015."

Thank you!
### ANNEX 6: WORK GROUP SUMMARY: Common obstacles, needs and strategies for African NGOs

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>COMMON OBSTACLES FOR NGO ON DDT</th>
<th>NEEDS</th>
<th>STRATEGIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATIONAL</td>
<td>Lack of information:</td>
<td>• Improved access to adequate and relevant information and facts</td>
<td>• Create awareness on safe DDT use</td>
</tr>
<tr>
<td></td>
<td>• Awareness and Knowledge</td>
<td>(technical and latest) on DDT and Malaria including policies and laws</td>
<td>• Meetings, seminars, conferences, etc to review communication strategies</td>
</tr>
<tr>
<td></td>
<td>• Inadequate facts</td>
<td>which can help in empowering communities</td>
<td>on DDT issues</td>
</tr>
<tr>
<td></td>
<td>• Data on malaria and DDT</td>
<td>• More research and dissemination on DDT and alternatives to relevant</td>
<td>• Train the media for information dissemination</td>
</tr>
<tr>
<td></td>
<td>• Alternatives to DDT</td>
<td>stakeholders</td>
<td>• Promote publications</td>
</tr>
<tr>
<td></td>
<td>• Transparency between NGOs</td>
<td>• Regular and transparent exchange communication between various</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Opportunities</td>
<td>stakeholders (Government and NGOs)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Political interference and lack</td>
<td>• Increase involvement of grassroots community and convince government</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of government will to support</td>
<td>• Increased Government participation in NGO activities Advocacy and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NGO activities:</td>
<td>lobbying to the decision makers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Involvement of NGOs, CSOs in</td>
<td>• Enhanced influence on government decision making process</td>
<td></td>
</tr>
<tr>
<td></td>
<td>implementation of NIPs and</td>
<td>• Need for cooperation with government agencies in implementation of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lack of cooperation from</td>
<td>programs on chemicals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>government</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Constraints facing NGOs in</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>performing their duties</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Negative perception/Recognition/Credibility of NGOs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Funding:</td>
<td>• Need for enough funds to carry out trainings, institutional capacity</td>
<td>• Lobby the Government to recognize the role of NGOs in DDT campaigns</td>
</tr>
<tr>
<td></td>
<td>• For project execution</td>
<td>e.g. to be</td>
<td>• Lobbying governments and relevant authorities to embrace DDT alternatives</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Collaboration/coordination between/among NGOs & Research Institutions:  
| - Competition between NGOs  
| Human resource capacity:  
| - Inadequate expertise on DDT and malaria  
| - Advocacy skills  
| - Monitoring and evaluation  
| • For participation in relevant activities and programmes at both national level and regional level  
| fully established for advocacies and lobbying  
| the NGOs  
| • Proposal writing and identification of donor agencies  
| • Coordinated initiative in order to secure financial support  
| • Capacity building in proposal development and fundraising skills  
| • Need for harmony and coordination among NGOs in their work e.g. coming up with advocacy forums i.e DDT forum  
| • Need for collaboration with research institute/universities for laboratory analyses  
| • Need for developing communication strategies  
| • Train the media for information dissemination  
| • Meetings, seminars, conferences, etc to review communication strategies on DDT issues  
| • Develop data base of expertise  
| • Develop capacity of NGO at all levels; advocacy and negotiation, lobbying etc.  
| • Need for training on how to write proposals, advocacy skills  
| • Identification of training needs for NGOs on advocacy skills, lobbying techniques  
| • Capacity building among NGOs on technical expertise on DDT  
| • Put in place a department in NGO organizations for monitoring and evaluation with staff  
| • Need for training on how to write proposals, advocacy skills  
| • Identification of training needs for NGOs on advocacy skills, lobbying techniques  
| • Capacity building among NGOs on technical expertise on DDT  
| • Put in place a department in NGO organizations for monitoring and evaluation with staff |
Institutional capacity in NGOs
- Offices
- Transport
- Communication
- Equipment

REGIONAL
- Insufficient information on alternatives
- Lack of adequate success stories on alternatives
- Participate in the demonstration of the alternatives
- Information about successful stories
- Trans-boundary information exchange
- Empowerment of NGOs on how to use Community Pesticide Action Monitoring (CPAM)

Exchange of ideas and sharing experiences for example visiting countries which has effectively eliminated DDT use in malaria control
- Harmonise CPAM activities at national level

Absence of the full cost benefit analysis of DDT and alternatives
- Active involvement in full cost-benefit analysis of DDT and alternatives

Development of Regional strategy with international stakeholders

Sub-standard application of DDT in some country programmes
- Involvement of NGOs in monitoring and evaluation
- Training and awareness raising of health issues to spray operators and recipients

Development of monitoring and evaluation plan together with government
Development of information communication materials

Marginalized position with regard to Stockholm Convention
- Involvement of NGOs in Stockholm convention at different levels
- Integration of NGO in the national and

Lobby with the national government to comply with article 7 of the
The document is discussing the regional implementation programme, which includes allowing countries to have more say in regional interventions and indicating NGO involvement during the agreement stage. It also mentions the Stockholm Convention involving relevant national stakeholders.

### ANNEX 7: WORK GROUP SUMMARY: REGIONAL PROGRAMME

<table>
<thead>
<tr>
<th>When</th>
<th>What</th>
<th>How</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORT TERM- (TOWARDS COP4)</td>
<td>Allocation of the NIP funds to CSOs &amp; updating the NIP</td>
<td>By the resolution of the COP</td>
<td>AGENDA (LEAD) PAN AFRICA ITUC(PAN-ETHIOPIA) IPEN iLIMA</td>
</tr>
<tr>
<td></td>
<td>Training and involvement of local experts and CS groups in NIP preparation and update</td>
<td>By the resolution of COP</td>
<td>AGENDA (LEAD) PAN AFRICA ITUC(PAN-ETHIOPIA) IPEN iLIMA</td>
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<tr>
<td></td>
<td>Pursue COP4 not to issue extension of DDT exemption</td>
<td>Develop a position paper on DDT</td>
<td>PSR-KENYA IPEN/PAN WG/ITUC</td>
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<tr>
<td></td>
<td>Prove to relevant stakeholders current IRS (DDT) programs in Africa do not comply with Stockholm Convention/WHO Standards</td>
<td></td>
<td>PSR-KENYA UNEMATC</td>
</tr>
<tr>
<td></td>
<td>Capacity building for the NGOs in countries using and intending to use DDT</td>
<td>By the resolution of COP</td>
<td>AGENDA (LEAD) PAN AFRICA ITUC(PAN-ETHIOPIA) IPEN iLIMA</td>
</tr>
<tr>
<td>Attention be given to non compliant countries</td>
<td>By the resolution of COP</td>
<td>AGENDA (LEAD) PAN AFRICA ITUC (PAN-ETHIOPIA) IPEN iLIMA</td>
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<td>------------------------------------------------</td>
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<tr>
<td>The cost benefit analysis &amp; life cycle assessment of DDT and alternatives</td>
<td>By the resolution of COP</td>
<td>AGENDA (LEAD) PAN AFRICA ITUC (PAN-ETHIOPIA) IPEN iLIMA</td>
<td></td>
</tr>
<tr>
<td>Decision to develop a project for capacity building for Civil Societies of countries using or intending to use DDT to support the correct implementation of the Stockholm Convention and alternatives to DDT in Vector Control</td>
<td>• Appointing lead agency • Coordinate between partners • Push for formulation of the proposal • Liaise with UNEP for submission</td>
<td>This meeting</td>
<td></td>
</tr>
<tr>
<td>• Alignment into DDT risks and DDT alternatives • Information package for NGOs • Information for Press • Information for communities</td>
<td>Desktop studies</td>
<td>PAN IPEN</td>
<td></td>
</tr>
<tr>
<td>Collaboration of NGOs, research institutions &amp; industry</td>
<td>Form task force Annual conference</td>
<td>PAN IPEN</td>
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</tr>
<tr>
<td>Establishment of National NGOs Committee on implementation of Stockholm Convention (DDT) (to complement the existing designated Focal Points)</td>
<td>NGOs meet to appoint</td>
<td>IPEN PAN Africa NGOs present in this meeting to facilitate the process at their own countries (appoint one)</td>
<td></td>
</tr>
<tr>
<td>Establishment of interim Regional Hub</td>
<td>NGOs meet to appoint</td>
<td>NGOs present at this meeting with assistance from PAN</td>
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<tr>
<td>MEDIUM TERM &gt; 5YEARS (June 2009 – June 2014)</td>
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<tr>
<td>Develop a project for capacity building for Civil Societies of countries using or intending to use DDT to support the correct implementation of the Stockholm Convention and alternatives to DDT in Vector Control</td>
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<tr>
<td>• Lobbying governments and relevant authorities to embrace DDT alternatives</td>
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<td>• Lobbying the governments to recognize the role of NGOs in DDT campaigns</td>
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<td>Coordinate between partners</td>
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<td>Push for formulation of the proposal</td>
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<tr>
<td>Liaise with UNEP for submission</td>
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<tr>
<td>PSR-KENYA (LEAD) PAN AFRICA UNEP GEF AGENDA</td>
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<td>Identify all available alternatives and publicize</td>
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<td>National, Regional and International Focal Points</td>
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<tr>
<td>Create awareness on adverse impact of DDT use amongst all stakeholders</td>
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<tr>
<td>Reach Out through seminars, workshops, publications, electronic &amp; print media, internet and telephone (messages), etc.</td>
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<tr>
<td>Focal Points, Other NGOs &amp; friendly media houses</td>
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<td>Develop communication strategy among NGOs at all levels</td>
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<td>• Identify the media consultants</td>
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<td>• Develop set of criteria for selecting</td>
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<td>• Set time limit</td>
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<td>• Develop terms of Reference for strategy development</td>
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<tr>
<td>JA!-MOZAMBIQUE NATIONAL COMMITTEE PAN AFRICA PSR-KENYA</td>
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<tr>
<td>Harmonize CPAM activities at national and regional levels</td>
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<td>PSR-KENYA, PAN AFRICA AGENDA TAPOHE-TANZANIA</td>
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<td>Establish time frame for final phasing out of DDT</td>
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# ANNEX 8: FORMATION OF REGIONAL NETWORK

## LIST OF FOCAL POINTS

<table>
<thead>
<tr>
<th>Focal Points</th>
<th>Responsible Person</th>
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<tbody>
<tr>
<td>Regional Hub</td>
<td>PSR-KENYA Dr. Paul Saoke</td>
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<tr>
<td>Countries</td>
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<tr>
<td>Uganda</td>
<td>UNETMAC Ellady Muyambi</td>
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<tr>
<td>Kenya</td>
<td>iLIMA Griffins Ochieng</td>
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<td>Tanzania</td>
<td>AGENDA Silvani Mng’anya</td>
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<td>Ethiopia</td>
<td>PAN ETHIOPIA Tadesse Amera</td>
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<td>Zambia</td>
<td>Entomological Society of Zambia Crispin Kaposhi</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Justica Ambiental (JA!) Arsenio Banze</td>
</tr>
<tr>
<td>Ghana</td>
<td>EYAN Osei Akoto</td>
</tr>
<tr>
<td>Nigeria</td>
<td>SRADev Eugene Itua</td>
</tr>
<tr>
<td>South Africa</td>
<td>Indaloyethu Environment Cooperative Mark Wells</td>
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</table>
ANNEX 9: MEETING PHOTOS

Group photograph
Dr. Myres Lugemwa - Malaria Control Programme (MCP), Ministry of Health, Uganda

Mr. Tadesse Amera - PAN Ethiopia
Mr. Jan Betlem - UNEP Division of GEF Coordination (standing) (LHS - Ms. Carina Weber, PAN Germany, RHS - Mr. A. Mwakatole, ENVIROCARE, Tanzania)

Mr. Kefa Sum - Pyrethrum Board of Kenya