UNITED NATIONS

SC

UNEP/POPS/COP.8/INF/8

Distr.: General
21 April 2017

English only

Stockholm Convention on Persistent Organic Pollutants

Conference of the Parties to the Stockholm Convention on Persistent Organic Pollutants
Eighth meeting
Geneva, 24 April–5 May 2017
Item 5 (a) (ii) of the provisional agenda*

Matters related to the implementation of the Convention: measures to reduce or eliminate releases from intentional production and use: DDT

Report by the United Nations Environment Programme on the implementation of the road map for the development of alternatives to DDT

Note by the Secretariat

As referred to in the note by the Secretariat on the evaluation of the continued need for DDT for disease vector control and the promotion of alternatives to DDT (UNEP/POPS/COP.8/5), the annex to the present note sets out a report on the implementation of the road map for the development of alternatives to DDT. The report has been submitted by the United Nations Environment Programme. The present note, including its annex, has not been formally edited.

* UNEP/POPS/COP.8/1.

Annex

Report on progress in implementing the Road Map for the Development of Alternatives to DDT

UN ENVIRONMENT | CHEMICALS AND HEALTH BRANCH, ECONOMY DIVISION – MARCH 2017

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Acronyms and abbreviations

BCRC	Basel Convention Regional Centre
BRS	Basel, Rotterdam and Stockholm Conventions Secretariat
COP	Conference of the Parties
DDT	Dichlorodiphenyltrichloroethane
GA	Global Alliance for Alternatives to DDT (Global Alliance for the development and deployment of products, methods and strategies as alternatives to DDT for disease vector control)
GEF	Global Environment Facility
GMP	Global Monitoring Plan
IGO	Inter-governmental Organization
IRS	Indoor Residual Spraying
IVCC	International Vector Control Consortium
IVM	Integral Vector Management
LLIN	Long-Lasting Insecticidal Nets
MEA	Multilateral Environmental Agreement
NGO	Non-Governmental Organization
NIP	National Implementation Plan
PMI	President’s Malaria Initiative
POPs	Persistent Organic Pollutants
POPRC	Persistent Organic Pollutant Review Committee
RBM	Roll Back Malaria Partnership
SC	Stockholm Convention
SCRC	Stockholm Convention Regional Centre
SDGs	Sustainable Development Goals

UN Environment	United Nations Environment Programme
UN-HABITAT	United Nations Settlements Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	The United States Agency for International Development
VCWG	Vector Control Working Group
WHO	World Health Organization
WHOPES	WHO Pesticides Scheme

Executive summary

The Road Map for the Development of Alternatives to DDT was developed in 2015 by the United Nations Environment Programme (UNEP), in consultation with the World Health Organization (WHO) and the DDT Expert Group and the Secretariat of the Stockholm Convention, as assigned under a mandate of the Conference of the Parties (COP) to the Stockholm Convention on Persistent Organic Pollutants (POPs). The purpose of the Road Map is to provide a thematic guide and sketch the steps that are needed for the development and deployment of alternatives to DDT for the purpose of disease vector control to Parties to the Stockholm Convention and other global stakeholders.

This report reviews progress in implementing the Road Map by the Parties of the Stockholm Convention and other global stakeholders since its creation. Such a review is essential to take stock on work during the eight COP to the Stockholm Convention (COP-8) to be held from 24 April to 5 May 2017 and to propose a path forward for implementing the Road Map based on the highlights and conclusions of this report.

In order to review progress of the implementation of the Road Map, four key sources were consulted, (1) Survey “Developing Alternatives to DDT” (UN Environment, 2017), (2) the “Report of the Effectiveness Evaluation on DDT pursuant to the Article 16 of the Stockholm convention” (DDT Expert Group, 2016), (3) the “DDT expert group and its report on the assessment of scientific, technical, environmental and economic information on production and use of DDT for disease vector control” (DDT Expert Group, 2016), and (4) the National Implementation Plans (Parties to the Stockholm Convention, 2004-present). When relevant, other complementary sources were used. Following, relevant data from the key sources is compiled, where after a discussion is provided and conclusions are drawn.

The report highlights and concludes that, to date there is a continued need for the use of DDT for Indoor Residual Spraying (IRS) where locally safe, effective and affordable alternatives are still lacking. India is the only country known to be producing DDT and three countries, India, South Africa and Mozambique, have reported use of DDT. Overall, most significant work since the creation of the Road Map has been made in areas regarding monitoring the global situation of DDT in terms of production, trade, use, stockpiles of DDT and environmental and human exposures, on the implementation of GEF projects and eliminating DDT stockpiles and waste. Some areas where efforts could be increased regard the coordination Road Map, raising funds for Road Map activities, compiling lessons learned and good practices, collecting comprehensive data, e.g. NIPs and capacity building.

Regarding the alternatives, several chemical alternatives are currently being evaluated by the WHO pesticides scheme (WHOPES). Work with regard to developing non-chemical alternatives to DDT is being undertaking, however, efforts, such as sharing lessons learned and good practices, are too little.

The GEF has approved a number of projects that support elimination of DDT stockpiles and waste, especially in Africa and Latin America. The total amount global stockpiles is currently estimated at approximately 20.000 tones, however, the amount is expected to be much higher. The largest stockpiles appear to be located in former Soviet Union countries, Africa and China.

Finally, the report stresses some difficulties with regard to review progress of the implementation of the Road Map, such as a lack of indicators, weak deadlines, insufficient comprehensive data available, and limited funding. For the path forward, at the end of the report a table with concrete, realistic and measurable outputs and outcomes for COP-9 are proposed.

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Introduction

With 91 malaria endemic countries in the world (WHO, 2016) and a continued need for dichlorodiphenyltrichloroethane (DDT) (DDT Expert Group, 2016), the “Road Map for the Development of Alternatives to DDT” (hereafter referred to as “Road Map”) is of key importance for a future toward locally safe, effective, affordable and environmentally sound alternatives for a sustainable transition away from DDT. This report will review progress on implementation of the

Road Map for the eighth Conference of the Parties of the Stockholm Convention (COP-8) in to be held from 24 April to 5 May 2017.

1. The Road Map for the Development of Alternatives to DDT ("Road Map")

1.1. Development of the Road Map

Through decision SC-6/1 on DDT, during the sixth meeting the Conference of the Parties (COP-6), the COP invited UN Environment (UNEP), in consultation with the World Health Organization (WHO), the DDT Expert Group and the Secretariat of the Stockholm Convention, to develop a Road Map and to present it to the COP at its seventh meeting (COP-7) in 2015 (Road Map, 2015).

1.2. Purpose of the Road Map

The purpose of the Road Map is to provide a thematic guide and sketch the steps that are needed for the development and deployment of alternatives to DDT for the purpose of disease vector control. The Road Map specifies the areas in which action is warranted and the activities that need to be undertaken as well as the actors that are responsible for them, and a tentative timeframe. Furthermore, its implementation needs multi-stakeholder efforts (Road Map, 2015).

1.3. Stakeholders involved in the Road Map

Some of the main stakeholders involved in the implementation of the Road Map are the Parties to the Stockholm Convention, UN Environment's Chemicals and Waste Branch, the Basel, Rotterdam and Stockholm (BRS) Secretariat, the Global Alliance for Alternatives to DDT, the World Health Organization (WHO), the DDT Expert Group, the Persistent Organic Pollutants (POPs) Review Committee (POPRC), Stockholm Convention Regional Centres (SCRCs), the Global Environment Facility (GEF), the United Nations Human Settlements Programme (UN-Habitat), industry and the private sector, civil society and academia, the global coordination group of the Global Monitoring Plan (GMP), and others (Road Map, 2015).

1.4. Structure of the Road Map

The general structure of the Road Map is as follows:

Activities/Areas of Action
1 Establish overall Road Map management and reporting procedures
1.1 Coordinate and implement the Road Map and provide funding
1.2 Prepare assessment reports, monitor developments and evaluate progress (linkages to effectiveness evaluation)

2 Implement the Road Map
2.1 Strengthen the base of knowledge for policy formulation and decision making
2.2 Strengthen country and local capacities to manage insecticide resistance, develop and implement IVM strategies, asses and deploy alternatives
2.3 Develop and deploy chemical alternatives to DDT for indoor residual spraying (IRS)
2.4 Sharing experiences and upscaling the application of non-chemical alternatives
3 Eliminate DDT stockpiles and waste

The Road Map document can be found as UNEP/POPS/COP.7/INF/6.

2. Objectives

The main objective of this report is to review progress on implementation of the Road Map and report this to COP-8. Based on the results, the report suggests several concrete, realistic and measurable outputs and outcomes for COP-9.

3. Methodology

3.1. Resources

The following four key sources were consulted:

a) Survey on Developing Alternatives to DDT (UN Environment, 2017)
b) Report of the Effectiveness Evaluation on DDT pursuant to the Article 16 of the Stockholm Convention (DDT Expert Group, 2016)
c) DDT expert group and its report on the assessment of scientific, technical, environmental and economic information on production and use of DDT for disease vector control (DDT Expert Group, 2016)
d) National Implementation Plans (Parties to the Stockholm Convention, 2006-present)

Further explanation for each source is provided below.

3.1.a. Survey on Developing Alternatives to DDT (UN Environment, 2017)

A comprehensive survey was carried out by UN Environment from 23 December 2016 to 3 February 2017. The target audience for the survey were the different stakeholders involved in the implementation of the Road Map.

After an introduction into the objective of the survey, the Road Map, the Stockholm Convention and DDT, each participant was requested to provide contact information (e.g. country or organization, designation, sector, e-mail) in order to classify the results per target group and later follow-up with the

participant in the survey for possible further inquiries and/or sharing the outcomes. Consequently, the survey followed the structure of the Road Map for the Development of Alternatives to DDT. For each activity of the different elements of the road map, the participants to the survey were invited to answer, by choosing the boxes with one of the three possibilities: Yes, No, or Not applicable. The last questions of the survey were related to the work on the DDT national inventories and obsolete stocks. Further information's was searched by other different sources, GEF projects on DDT, cooperation's projects related with Malarias eradications and others.

3.1.b. Report of the Effectiveness Evaluation on DDT pursuant to the Article 16 of the Stockholm Convention (DDT Expert Group, 2016)

"The purpose of the effectiveness evaluation report is: to assess, in accordance with the framework for effectiveness evaluation, whether the Convention has succeeded in achieving its objective of protecting human health and the environment from POPs; to determine more specifically the effectiveness of the specific measures provided in the Convention to achieve this objective; and to identify ways to improve the effectiveness of the Convention" (UNEP/POPS/COP.8/INF/40)

With regard to DDT, the report concluded and recommended the following:

"In several African countries, recent capacity building on entomological surveillance and insecticide susceptibility monitoring has prompted a timely policy change away from the use of DDT. The effectiveness of the Stockholm Convention towards achieving its global objectives regarding DDT could be further improved by focusing efforts to reduce the current high levels of DDT use in some countries. Indications of increased use of DDT for leishmaniosis control and the spread of emerging vector borne health threats point to the need for adoption of more integrated vector control methods and more education about the benefits for local communities of reducing reliance on DDT, and in developing safer, technically feasible, accessible, more effective and affordable non-POPs alternatives (UNEP/POPS/COP.8/INF/40).

3.1.c. DDT expert group and its report on the assessment of scientific, technical, environmental and economic information on production and use of DDT for disease vector control (DDT Expert Group, 2016)

The DDT expert group assessed the information on production and use of DDT and prepared a report for the consideration of the Conference of the Parties at its eighth meeting (UNEP/POPS/COP.8/INF/6)

3.1.d. National Implementation Plans (Parties to the Stockholm Convention, 2006-present)

"A national implementation plan (NIP) is a plan for implementing at the national level the obligations under the Convention. Article 7 of the Convention requires Parties to develop and endeavour to

implement a plan for implementing its obligations under the Convention, and to transmit it to the Conference of the Parties within two years of the entry into force of the Convention for the Party" (Stockholm Convection, web).

3.1.e. Other sources

Some of the other key sources of relevance include:

- Evaluation of the continued need for DDT for disease vector control and the promotion of alternatives to DDT (INF/POPS/COP.8/5)
- Register of DDT pursuant to paragraph 1 of part II of annex B of the Stockholm Convention
- Global Monitoring Plan documents
- National Reports pursuant to Article 15 of the Convention
- Website information and website documents, e.g. USAID President's Malaria Initiative, WHO, RBM, the Stockholm Convention and the GEF.

3.2. Compilation of data

In order to review progress on the implementation of the Road Map, the four resources elaborated on in part 3.1 were advised for each element of the Road Map if applicable.

4. Results

The following part will present relevant data from the four key sources mentioned in part 3.1, following the structure of the Road Map.

Part 1 Establish overall roadmap management and reporting procedures

1.1 Coordinate and implement the road map and provide funding

Activities/Areas of Action	Responsible actors	Timeline
1 Establish overall roadmap management and reporting procedures		
1.1 Coordinate and implement the road map and provide funding		
1.1.1 Make the provisions for the coordination and implementation of the roadmap; adopt an initial budget for coordination of the road map	UNEP Chemicals Branch	Starting May 2015
1.1.2 Develop the terms of reference and nominate members of the coordinating and implementing body and prepare an initial budget for implementation	UNEP Chemicals Branch in consultation with SC Bureau, WHO, Global Alliance, DDT expert group, BRS Secretariat	June – September 2015
1.1.3 Prepare progress reports to the COP and annual interim reports	Coordinating and implementing body	September 2015 onwards
1.1.4 Generate funding for implementation and coordination of the road map	Coordinating and implementing body; parties; donors, GEF	May 2015 onwards

Table 1. Section 1.1 of part 1 of the Road Map

UN Environment, in its function as the secretariat of the Global Alliance, has been the main coordinator and implementing body for the Road Map (1.1.1, 1.1.2). One of the main activities toward COP-8 was the survey on Developing Alternatives to DDT (2017) and this report on implementation of the Road Map in order to report to the COP (1.1.3).

With regard to funding (1.1.1, 1.1.2, 1.1.4), UN Environment and the Basel, Rotterdam and Stockholm Conventions Secretariat has had contacts with partners that indicated interest in providing funding for supporting implementation of the Road Map, for example with regard to national road maps, information on global stockpiles and contaminated sites and capacity building. Another activity with funding opportunities for the Road Map has been the AFRO II GEF project (Project ID 4668). This project is of particular relevance for part 2.2 of the Road Map, in relation to alternatives to DDT. Furthermore, other stakeholders indicated in the survey to have made funds available in relation to activities as part of the Road Map (Survey on Development alternatives to DDT, 2017). However, overall funding appears to be limited.

Although no specific annual interim reports (1.1.3) for the Road Map have been developed since its establishment, other regular forms of reporting, such as the national reports under the Stockholm Convention[1] (every four years), the DDT Questionnaire about production and use of DDT by the Basel, Rotterdam and Stockholm Conventions Secretariat (every two years) and the National Implementation Plans (NIPs) (every COP if a new POP is added to the Convention), should be taken

[1] The Conference of the Parties (COP) decided at its first meeting that national reports, as stipulated in the Article 15 of the convention, shall be submitted every four years. The national reports contains information on the measures taken by a Party in implementing the SC and on its effectiveness.

into consideration as of added value for this. Please find further information about country updates with regard to these three sources below:

- **National Reports:** As of February 2017, 45 Parties transmitted their first National Reports, 95 Parties transmitted their second National Report and 88 Parties transmitted their third National Report. Submission of the fourth National Report is expected in 2018 (National Implementation Plans, Effectiveness evaluation, 2016)
- **DDT Questionnaire:** A total of 30 Parties responded to the DDT Questionnaire for the period 2012-2014. Among them, there were 10 Parties, out of 17, that are registered for acceptable production/use of DDT. There were 3 Parties reported use for vector control, 7 parties no reported use and the other 7 not submit their questionnaires (DDT Expert group, 2016, Effectiveness evaluation, 2016). However, information provided by exporters indicated that at least five other countries in addition to these have imported DDT during the reporting period (DDT Expert group, 2016).
- **NIPs:** As of February 2017, 163 Parties have transmitted their NIPs, addressing at least the 12 initial POPs. Furthermore, 45 Parties have submitted NIPs addressing COP-4, 39 Parties have submitted NIPs addressing COP-5 and 12 Parties NIPs addressing COP-6 (National Implementation Plans).

One main deficiency observed with regard to part 1.1 is the development of Terms of Reference (1.1.2) for the coordinating and implementing body of the Road Map.

Part 1.2 Prepare assessment reports, monitor developments and evaluate progress (linkages to effectiveness evaluation)

Activities/Areas of action	Responsible actors	Timeline
1.2 Prepare assessment reports, monitor developments and evaluate progress (linkages to effectiveness evaluation)		
1.2.1 Assess and monitor the global situation in terms of production, trade, use (including areas of application and illegal use), stockpiles of DDT (including updating of DDT register), and environmental and human exposures	DDT expert group; global coordination group of the global monitoring plan; BRS Secretariat; UNEP Chemicals Branch	May 2015 onwards
1.2.2 Prepare reports on insecticide resistance, cost-effectiveness of DDT, alternatives and barriers to deployment of alternatives on regular basis	UNEP Chemicals Branch in consultation with WHO, Global Alliance, IVCC, and industry	May 2015 onwards
1.2.3 Regularly assess the continued need for DDT for disease vector control and report to the COP	DDT Expert Group, WHO	Ongoing
1.2.4 Evaluate ongoing national and international projects and status of funding and encourage research where necessary	UNEP Chemicals Branch; Global Alliance; GEF; Regional Centres	May 2015 onwards
1.2.5 Prepare recommendation when locally safe, effective, affordable and environmentally sound alternatives are available	DDT expert group	Upon existence of sufficient evidence

Table 2. Section 1.1 of part 1 of the Road Map

With regard to 1.2.1 of the Road Map, the DDT Register lists the countries that are allowed to produce/use DDT. India, Ethiopia and Namibia are registered to produce DDT and 17 countries are registered to use DDT (Stockholm Convention website, DDT Register, web. 2017). Information from the DDT Questionnaire covering the 2012-2014 reporting period showed that only India produced DDT (DDT Expect group, 2016).

The report of the Effectiveness Evaluation on DDT (2016) elaborated on the global situation in terms of production, trade, use, stockpiles of DDT, and environmental and human exposures (1.2.1). The report states “the current status as reported by countries shows 64% of parties with a production prohibition on DDT, 74% with an import prohibition, and 82% with a prohibition on agriculture use […]. Prohibition on public health use is less common, because a number of parties continue to accept the use of DDT for disease vector control. A reporting bias, with lower reporting rates among resource-poor countries, cannot be ruled out. However, it should be noted that the latest data of this comes from 2014 (Effectiveness Evaluation, 2016).

The DDT expert group report on the assessment of the production and use of DDT and its alternatives for disease vector control (2016) also elaborated on the global situation in terms of production, trade, use, stockpiles of DDT, and environmental and human exposures (1.2.1) (DDT Expert group, 2016).

The report states as follows:

1.1 Sources and amounts of DDT production and use 2012-2014

1. *The Secretariat to the Stockholm Convention distributed the adopted DDT questionnaire to the 178 Parties to provide information on production and use of DDT for disease vector control covering the 2012-2014 reporting cycle. A total of 30 Parties responded to the DDT questionnaire (…). Among these respondents were 10 Parties out of the 17 registered for acceptable use/production of DDT. The 7 countries in the DDT Register that did not submit their questionnaires for 2012-2014 include Swaziland, Ethiopia, Uganda, Botswana, Marshall Islands, Namibia and Venezuela. Of the 10 responding Parties, 3 (India, South Africa and Mozambique) reported use of DDT for disease vector control. Zambia and Swaziland had reported use of DDT in the reporting cycle 2009-2011. Gambia reported DDT use in 2006-2008 and in 2009-2011, but did not notify the Register of acceptable purposes at the time and has not since submitted information on DDT use. Myanmar withdrew from the DDT Registry in February 2012 and as of June 2014, China has withdrawn from the DDT Registry and has stopped all production and use of DDT in malaria elimination efforts. The Global Monitoring Plan from 2015 reported use of DDT in the Democratic People's Republic of Korea for vector control and illegal use of DDT for agricultural purposes by farmers in Lao People's Democratic Republic– neither country is registered to the convention*[2].

1.1.1 Global production

11. *The information provided by the Parties to the DDT questionnaire covering the 2012-2014 reporting cycle showed that India was the only producer of DDT. All DDT products were produced at the Hindustan Insecticide Ltd factories, which is the only registered production site for DDT in the world. India's production of DDT technical grade material (98-99% a.i.) was 3,664.00 Metric Tons (MT) in 2011-12; 3,368.00 MT in 2012-13; and 3,168.00 MT in 2013-14 – adding up to 10,200.00 MT in total production from 2011-2014 (Table 2).*

12. *The total production of technical grade DDT in reporting cycles 2009-2011 (10,246.00 MT) and 2012-2014 (10,200.00 MT) has remained mostly unchanged. However, as reported in the effectiveness evaluation report the average production over the past 12 years shows a modest decline.*

13. *Of the technical grade material produced in the period 2012-2014, 91% was reported used in India to prepare DDT formulations of 50% Wettable Powder (WP) for domestic use. The remaining 9% of DDT was exported during the 2012-2014 reporting cycle.*

1.1.2 Export and import of DDT

14. *According to the available information,* ***Ethiopia, India and South Africa*** *are the only three countries with an export/re-export of DDT 75% WP (Table 3). In India, DDT is exported directly from the Hindustan Insecticide Ltd factory (Rasayani Unit). India exported DDT formulations of 75% WP in all three reporting years: 393.75 MT in 2011-12; 369.80 MT in 2012-13; 101.37MT in 2013-14; and 353.90MT in 2014-15. India exported DDT to South Africa, Mozambique, Zimbabwe, Botswana, Namibia and Gambia during reporting cycle 2012-2014.*

15. ***Ethiopia*** *re-exported a small amount of DDT to South Africa in 2012, and South Africa re-exported a small amount of DDT to Swaziland in all three years.*

16. ***Zimbabwe*** *imported a significant quantity of DDT (698.12 MT) from India during the reporting cycle of 2012-2014.*

17. ***Mozambique*** *imported 201.67 MT of DDT from India during the reporting cycle of 2009-2011. However, during this reporting cycle they only imported a small amount in 2014 (73.03 MT). Whether this reflects stockpiling of previously imported DDT or an actual reduction in use for the given years, is unknown at this point.*

18. ***Swaziland*** *has not submitted any information on their DDT import, use or stock in this reporting cycle, but in the last reporting cycle of 2009-2011, they reported import and use of DDT. In reporting cycle 2009-2011, Ethiopia reported no use of DDT and did not include information on stocks of DDT.*

National reporting is another source for country specific information on the global situation in terms of production, trade, use, stockpiles of DDT and environmental and human exposures (1.2.1) (National Reports).

The results of the first phase of the Global Monitoring Plan on POPs provides data on environmental and human exposure as samples were taken in human milk and air (1.2.1). The report on the phase does provide specific data for countries, but only preliminary conclusions. The second phase (2016-2020) will be of interest to make conclusions on trends and will also include water samples and so called “national samples” (e.g. food, sediments) (Global Monitoring Plan).

Results from the survey on Developing Alternatives to DDT show a notable activity by organizations related to the preparation of reports on insecticide resistance, cost-effectiveness of DDT, alternatives and barriers to deployment of alternatives on regular basis (1.2.2). In particular, universities,

industries, IGOs, NGOs and regional centres appear to be most actively work on this (Survey on Development alternatives to DDT, 2017).

The DDT Expert Group and its report on the assessment of scientific, technical, environmental and economic information on production and use of DDT for disease vector control assessed the continued need for DDT disease vector control in order report to the COP (1.2.3). The report concluded that "there is a continued need for DDT for indoor residual spraying (IRS) in specific settings for disease vector control where locally safe, effective and affordable alternatives are still lacking" (DDT Expert Group, 2016).

Major projects covering activities that support the implementation of the Road Map, such as GEF project so called AFRO II, are being implemented by UN Environment and other agencies. Other initiatives include projects are coordinated by, for example, United States Agency for International Development – President's Malaria Initiative (USAID-PMI), the Roll Back Malaria Partnership, the United Nations Development Programme (UNDP), the United Nations Human Settlements Programme (UN-HABITAT) and NGOs, such as Biovision.

With regard to evaluating the status of funding, UN Environment has observed shortcomings (1.2.4). The DDT Expert Group (1.2.4) in its recommendations stresses that "there is an urgent need for funding at the global level for research and development into new vector control tools, aiming to generate evidence that would meet the requirements for policy recommendations on alternatives to DDT by WHO" (DDT Expert Group, 2016).

The DDT Expert group recommends the following in relation to locally safe, effective, affordable and environmentally sound alternatives to DDT (1.2.5):

- "Use of DDT for leishmaniosis vector control should only be considered if safe, effective and affordable alternatives to DDT are not available" (DDT Expert Group, 2016).
- "Countries should seek WHO guidance before considering DDT for the control of vectors of arboviruses" (DDT Expert Group, 2016).

Furthermore, the Report of the Effectiveness Evaluation on DDT (2016), with regard to the Road Map and locally safe, effective, affordable and environmentally sound alternatives to DDT (1.2.5) recommends that "further support is needed for the development of safer, effective and affordable alternatives to DDT and for strengthening the capacity of Parties still relying on DDT to commence a sustainable transition away from DDT" (Effectiveness Evaluation, 2016).

Part 2. Implement the Road Map

2.1 Strengthen the base of knowledge for policy formulation and decision-making

Activities/Areas of Action	Responsible actors	Timeline
2 Implement the road map		
2.1 Strengthen the base of knowledge for policy formulation and decision-making		
2.1.1 Gather, consolidate and – where necessary – expand or update and translate relevant existing guidance material and training manuals, including economic analyses	Global Alliance; WHO; RBM working group; Regional Centres	May 2015 – May 2017
2.1.2 Develop standardized monitoring and information management tools and strategies to support planning, targeting, management and evaluation of vector control operations; update, enhance and synthesize decision support tools for national vector control programs	UNEP Chemicals Branch; WHO; IVCC; industry; RBM working group; academia	May 2015 – May 2017
2.1.3 Establish and coordinate national, regional and global information sharing mechanisms (e.g. on vector resistance mechanisms, best practices in IVM; status of alternatives)	Global Alliance; parties; academia; Regional Centres, WHO	January 2016 onwards
2.1.4 Identify countries still using DDT for vector control; undertake country-specific assessments (epidemiological and entomological field data; capacity to introduce alternatives, and implement IVM; motivation and rational for using DDT; opportunities and challenges etc.)	BRS Secretariat; UNEP Chemicals Branch; parties	September 2015 – September 2016

Table 3. Section 2.1 of part 2 of the Road Map

Guidance materials and training manuals (2.1.1) have been developed by, among others, the WHO, the Roll Back Malaria Partnership, NGO's and regional centres (Survey on Developing Alternatives to DDT, 2017). It is unknown if any translation of materials to other UN languages was done.

With regard to 2.1.2, the Basel, Rotterdam and Stockholm Conventions (BRS) Secretariat developed a "toolkit for the sound management of DDT for disease vector control with the aim of providing user-friendly access to information and resources pertaining to the life-cycle management of DDT in the context of the chemicals and wastes conventions" (UNEP/POPS/COP.8/5).

Conclusion 7: "Training tools and guidelines are available for use of alternative insecticides and non-chemical methods. A draft strategic Global Vector Control Response 2017–2030 being developed by WHO, which will be considered for endorsement by World Health Assembly in May 2017, will highlight the importance of vector control in line with goal 3.3 of SDG." (UNEP/POPS/COP.8/5).

Conclusion 10: "In addition, there is an extensive research and development pipeline of novel vector control tools relying on a variety of approaches, including new molecule and repurposed chemicals; bacterial, physical and genetic manipulation of vectors; vector baiting and trapping techniques; new generation LLINs including the use of synergists to restore susceptibility to pyrethroids; insect growth regulators; and fungal IRS. However, none of these new vector control approaches are currently backed by sufficient evidence of epidemiological efficacy, safe use and efficient operational delivery to be considered for public health interventions. In some cases, insufficient funding has led to slow development of new tools." (UNEP/POPS/COP.8/5).

A shortcoming highlighted in the with regard to new vector tools appears limited funding (UNEP/POPS/COP.8/5).

In addition, with regard to 2.1.2, on the website[2] of the USAID President's Malaria Initiative (PMI) Malaria Operational Plans[3], stories from the field and contracts and agreements for 19 malaria endemic countries in Africa and the Greater Mekong Sub region can be found.

Work on global information sharing mechanisms (2.1.3) is mainly being carried out by universities, industries and NGO's. Further details on this are however unavailable. (Survey on Development alternative to DDT, 2017).

The DDT Expert Group has provided a motivation and rational for using DDT (2.1.4) (DDT Expert Group, 2016). Countries currently using DDT should be listed in the DDT Register of the Stockholm Convention. Currently 17 countries are registered to use DDT. Other sources for knowledge about countries using DDT are the National Reporting data, National Implementation Plans (NIPs) and answers to the DDT Questionnaire. Furthermore, as mentioned for part 2.1.2, the USAID President's Malaria Initiative provides information on epidemiological and entomological field data.

[2] https://www.pmi.gov/

[3] Each plan reviews the current status of malaria control and prevention policies and interventions, identifies challenges and unmet needs to achieve PMI goals, and provides a description of planned PMI-funded activities.

2.2 Strengthen country and local capacities to manage insecticide resistance, develop and implement IVM strategies, assess and deploy alternatives

Activities/Areas of Action	Responsible actors	Timeline
2.2 Strengthen country and local capacities to manage insecticide resistance, develop and implement IVM strategies, assess and deploy alternatives		
2.2.1 Implement relevant existing national, regional and global GEF projects and report progress and outputs	GEF implementing agencies; parties; donors	Ongoing
2.2.2 Draft and implement national or regional GEF and other projects, featuring among others demonstration projects of chemical and non-chemical alternatives as well as IVM, based on 1.2.1, 1.2.2 and 2.1.4; integrate objectives into national action plans within the reviewed/updated NIPs	GEF implementing agencies; parties; donors	October 2016 onwards
2.2.3 Conduct targeted webinars, provided that the technical preconditions are given, and country-level workshops in the language of the respective country based on 2.1.4; disseminate and train relevant staff in the use of the manuals and materials from 2.1.1 as well as the tools and strategies from 2.1.2	UNEP Chemicals Branch; Global Alliance; BRS Secretariat	June 2017 – June 2020

Table 4. Section 2.2 of part 2 of the Road Map

The GEF has funded the following projects (2.2.1, 2.2.2) in relation to strengthen country and local capacities to manage insecticide resistance, develop and implement IVM strategies, assess and deploy alternatives:

- **Demonstration of effectiveness of diversified, environmentally sound and sustainable interventions, and strengthening national capacity for innovative implementation of integrated vector management (IVM) for disease prevention and control in the WHO AFRO Region, 15 countries in Africa, launched in 2016.** The objective of the project is to strengthen national capabilities for implementation and scaling up of evidence-based, innovative, diversified and environmentally sound disease vector control interventions (with special emphasis on malaria) with multi-stakeholder participation within context of IVM (The GEF Project ID 4668).

- **Development and promotion of Non-POPs Alternatives to DDT, India, approved for implementation in 2015.** The project aims to introduce bio- and botanical pesticides and other locally appropriate cost-effective and sustainable alternatives to DDT as first step for reduction and eventual elimination of dependency on DDT, ensuring food safety, enhancing livelihood and protecting human health and the environment (The GEF Project ID 4612).

- **Disposal of Obsolete Pesticides including POPs, Promotion of Alternatives and Strengthening Pesticides Management in the Caribbean, approved for implementation in 2015.** The objective is to promote the sound management of pesticides in the Caribbean throughout their life-cycle in ways that lead to the minimization of significant adverse effects on human health and the global environment (The GEF Project ID 5407).

- **DSSA Demonstrating and Scaling up Sustainable Alternatives to DDT for the Control of Vector-borne Diseases in Southern Caucasus and Central Asia, project closed in 2016.** The objective was to protect human health and the environment by assisting countries to reduce and eliminate production, use, and releases of POPs, and consequently contribute generally to capacity development for the sound management of chemicals (The GEF Project ID 3614).

A webinar (2.2.3) within the theme of non-chemical alternatives to DDT, titled “Reducing chemicals for vector control: moving from DDT to the Sustainable Development Goals” is scheduled for the first week of April 2017 by UN Environment, in its function as secretariat of the Global Alliance, in collaboration with the BRS Secretariat.

Some NGO’s, such as Green Cross, Biovision, Vector Control Working Group (VCWG) and the USAID President’s Malaria Initiative, and universities are involved in providing country-level workshops (2.2.3) (Survey on Development alternative to DDT, 2017).

2.3 Develop and deploy chemical alternatives to DDT for indoor residual spraying (IRS)

Activities/Areas of action	Responsible actors	Timeline
2.3 Develop and deploy chemical alternatives to DDT for indoor residual spraying (IRS)		
2.3.1 Adapt the workplan of the Global Alliance to support the implementation of the roadmap where necessary	UNEP Chemicals Branch with Steering Committee of the Global Alliance	September 2015 – January 2016
2.3.2 Implement a tiered process for the selection of new active ingredients and formulations of existing pesticide classes/agrochemicals suitable for vector control and prepare report on first and secondary screening, laboratory studies (WHOPES Phase I), data mining and proof of concept	IVCC; industry; Global Alliance; WHOPES	Ongoing
2.3.3 Product optimisation and development	Industry, IVCC	Ongoing until 2022
2.3.4 Assess new active ingredients and new formulations in terms of i) POPs characteristics, potential hazards to human health and the environment , ii) impact on disease morbidity, iii) cost and cost-effectiveness, and iv) operational acceptability	WHOPES; POPRC; industry; civil society, academia; regulatory authorities	After first results from 2.3.2. and 2.3.3
2.3.5 Undertake pilot testing on regional basis; evaluations in small-scale field trials/experimental huts (WHOPES Phase II) and large-scale field trials (WHOPES Phase III)	UNEP Chemicals Branch; Global Alliance; DDT using parties; WHOPES; IVCC; industry	after first results from 2.3.4
2.3.6 Develop specifications for quality control and international trade; obtain regulatory approval, make available and deploy active ingredients and formulations that are considered safe, affordable and at least as cost-effective as DDT in vector control, as assessed in 2.3.4 and 2.3.5	WHOPES; national regulatory authorities; industry; donors; parties	2017 onwards

Table 5. Section 2.3 of part 2 of the Road Map

The status of the workplan of the Global Alliance was discussed during its online meeting on 2 March 2017, during which the support for the implementation of the Road Map was considered (2.3.1). It was suggested to develop a new workplan of the Global Alliance for 2017-2019, in accordance with the Road Map, addressing defining strategies and raising funds. More details can be found in section 7m of this report on proposed next steps.

Some significant work in relation to the selection and the evaluation of new active ingredients and formulations of existing pesticide classes/agrochemicals suitable for vector control has been monitored by WHO Pesticides Evaluation Scheme (WHOPES) and industries (2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.3.6). WHOPES published a list of pesticide products under WHOPES laboratory and or field testing and evaluation on 26 January 2016 (Table 6).

Application	Current Phase	Product	Manufacturer
Indoor Residual Spraying	I	SumiShield WG	Sumitomo Chemical, Japan
	I	Fludora Fusion WP-SB	Bayer CropScience, France
Long-lasting insecticidal nets	I	DuraNet Plus LN	Shobikaa Impex Pvt Ltd, India
	I	Interceptor G2 LN	BASF, Germany
	I	Royal Guard LN	Disease Control Technologies, USA
	II	Veeralin LN	Vector Control Innovations, India
	III	DawaPlus 2.0 LN	Tana Netting, UAE
	III	LifeNet LN	Bayer CropScience, France
	III	Olyset Plus LN	Sumitomo Chemical, Japan
	III	PermaNet 3.0 LN	Vestergaard Fransden, Switzerland
Mosquito larviciding	I	SumiLarv 2MR	Sumitomo Chemical, Japan
	II-III	VectoMax GR (Bti+Bs)	Valent BioSciences Corp., USA
	II-III	Bactivec SC (Bti)	Labiofam, Cuba

Table 6. Pesticide products under WHOPES laboratory and or field testing and evaluation. WG= water dispersible granules; WP-SB= wattable powder packaged in water soluble bags; LN= long-lasting insecticidal net; MR= matrix release formulation; GR= granules; SC= suspension concentrate. Source: http://www.who.int/whopes/Products_Under_WHOPES_Evaluation_January_2016.pdf

Bayer confirmed in the Survey on Alternatives to DDT that they are working on the development of two new products. Moreover, they indicated that the new products will be available well before the 5-10 year timeframe indicated in part 2.2.2.2 on page 14 of the Road Map (Survey on Development alternative to DDT, 2017).

The Intelligent Insect Control SARL (IIC) stated in the Survey on Alternatives to DDT that they are working on the development of alternative products to DDT by developing long lasting IRS (2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.3.6) (Survey on Development alternative to DDT, 2017).

Furthermore, the Vector Control Working Group (VCWG) of the Roll Back Malaria Partnership supports implementation and promote best practices of chemical alternatives to DDT, e.g. IRS and LLIN (VCWG, web, February 2017).

2.4 Sharing experiences and upscaling the application of non-chemical alternatives

Activities/Areas of action	Responsible actors	Timeline
2.4 Sharing experiences and upscaling the application of non-chemical alternatives		
2.4.1 Compile lessons learned and good practices from projects and programmes using non-chemicals alternatives for control of malaria and leishmaniasis (and report back to COP-8)	Parties; Global Alliance; Regional Centres; civil society; academia; UNDP Multisectoral Framework; UN-Habitat	September 2015 – December 2016
2.4.2 Undertake pilot studies where deemed necessary	Parties; Global Alliance; Regional Centres; civil society; academia; donors; UNDP Multisectoral Framework; UN-Habitat	June 2017 onwards
2.4.3 Undertake activities to scale up the development and deployment of non-chemical alternatives, among others by strengthening institutional structures and supporting multi-sectoral approaches, including as part of 2.2.1 and 2.2.2		May 2015 onwards

Table 7. Section 2.4 of part 2 of the Road Map

Several universities, NGOs and the Regional Centres, indicated in the Survey on Alternatives to DDT that they are involved in activities with regard to 2.4.2, and 2.4.3. A general focus can be observed on housing and Integrated Vector Management (IVM). However, efforts, such as sharing lessons learned and good practices, are too little (Survey on Development alternative to DDT, 2017).

The Vector Control Working Group (VCWG) of the Roll Back Malaria Partnership supports implementation and promote best practices of non-chemical alternatives to DDT, e.g. improving housing (2.4.1) (VCWG, web, February 2017).

With regard to activity to 2.4.3, it is noteworthy to point out the linkage with Sustainable Development Goal 17 on Strategic Partnerships. In the Survey on Alternatives to DDT many countries focal points, Regional Centres, NGOs, universities and industries indicated that they are particularly involved in strengthening institutional structures and supporting multi-sectoral approaches (Survey Developing Alternatives to DDT, 2017)

UN Environment, the GEF, BRS secretariat, Global alliance and the Regional centres have been working closely together since the creation of the Road Map. In turn, they have been in regular contact with the Parties to the Stockholm Convention and the many other stakeholder such as academia, NGOs, and industries.

Part 3. Eliminate DDT stockpiles and waste

Activities/Areas of action	Responsible actors	Timeline
3 Eliminate DDT stockpiles and waste		
3.1 Update national inventories as part of 2.2.1 and 2.2.2	Parties; GEF implementing agencies; Global Alliance; private sector; bilateral; donors	May 2015 onwards
3.2 Collect obsolete stocks as part of 2.2.1 and 2.2.2		May 2015 onwards
3.3 Repackage and dispose as part of 2.2.1 and 2.2.2		May 2015 onwards

Table 8. Section 3 of the Road Map

The Survey on Alternatives to DDT is an important source of information in order to take stock on work with regard to updating national inventories. New information collected can be found in the part below. Other key sources are the DDT questionnaire, national reporting and the website of the Stockholm Convention, which shows the National Implementation Plan updates (see section 1.1 of the present document).

The survey showed that NGOs, cooperation agencies, universities, and Parties to the Stockholm Convention have been involved in the activities 3.1, 3.2 and 3.3 (Survey on Development alternatives to DDT, 2017). The list below provides further details on this new information.

- **The USAID President's Malaria initiative** has collected and disposed **115 tons of DDT** in Ethiopia in October 2015 (President's Malaria Initiative, 2017, Survey on Developing Alternatives to DDT, 2017).
- The directorate of **Malaria Control, Ministry of National Health Service from Pakistan** stated that they have collected and stocked **400 tons of DDT** that are waiting for disposal, in November 2015 (Survey on Developing Alternatives to DDT, 2017)
- **The University of Gezira, Dept. of Pesticides & Toxicology from Sudan**, indicated that they collected a total of 1248 tons of Persistent Organic Pollutants (POPs), including **1.6 tons of DDT,** in March 2013 (Survey on Development alternative to DDT, 2017).
- **The program of vector-borne diseases of the Secretariat of Health from Mexico** ("Programa de Enfermedades Transmitidas por Vectores de La Secretaría de Salud") stated that between 2011 and 2012 the last **86.3 tons of DDT** of Mexico's stockpiles were incinerated (Survey on Development alternative to DDT, 2017).
- **Green Cross Switzerland** has been actively working on the repackaging and disposal of **361.8 tons of DDT in Central Asia**. In Georgia, the stocks have already been disposed, in Kyrgyzstan and Tajikistan are currently temporarily stored (Survey on Development alternative to DDT, 2017).

- **Division of International Organization and Convention, Department of International Cooperation, MEP from China**, indicated that from 2009 to 2012, **13 tons of DDT emulsion oil** and **636.27 tons of DDT** contained waste were collected and disposed (Survey on Development alternative to DDT, 2017).

The GEF has funded the following projects (3.2 and 3.3) in relation to collecting repackaging and disposal of DDT stocks:

- **Sustainable management of POPs in Mauritius**. As part of this project, Mauritius disposed **142 tons of DDT** stockpiles in 2013-2014. (The GEF Project ID 3205, Survey on Developing Alternative to DDT, 2017).
- **Prevention and Disposal of POPs and Obsolete Pesticides in Eritrea.** As part of this project the Stockholm Convention Focal Point in Eritrea, from the Ministry of Land, Water and Environment, stated that all **38.8 tons of DDT** stocks are being disposed as part of the project and currently two shipments have been made and the third will be done shortly (The GEF Project ID 3987, Survey on Developing Alternative to DDT, 2017).
- **Disposal of POPs Wastes and Obsolete Pesticides.** This project was implemented by the Food and Agriculture Organization of the United Nations (FAO) and executed by the Ministry of Agriculture and Food Security of Mozambique. In the survey the Ministry indicated that in 2012**, 50 tons** of obsolete and associated DDT wastes were collected and disposed. In 2015, **8 tons** were collected and repacked and are waiting for disposal (The GEF Project ID 3983, Survey on Developing Alternative to DDT, 2017).
- **Environmentally Sound Management and Disposal of Polychlorinated Biphenyl (PCB) - Containing Equipment and Disposal of DDT Wastes, and Upgrade of Technical Expertise**. One of the main objectives of this project is to dispose all the **15 tons of DDT** stockpiles that still remain in Guatemala. This project was approved for implementation in 2015 (The GEF Project ID 5861, Survey on Development alternative to DDT, 2017).
- **Belize Chemicals and Waste Management Programme.** As part of this project Belize shipped **24 tons of DDT** to France for final destruction in 2017 (The GEF Project ID 5094, Adele Ramos, 2017).

UN Environment and BRS secretariat compiled information of the bassline situation regarding global DDT stockpiles. As a result, a total amount of approximately 20,000 tons DDT stockpiles were identified worldwide. However, the actual amount is expected to be much higher due to the limited sources of information and outdated data. BRS secretariat jointly with UN Environment are actively working, with a contribution from Germany, on the report “DDT Global inventory report on DDT legacy stocks and landfills”.

5. Discussion

Firstly, it should be taken into account that this report offers a compilation of data. Secondly, it should be noted that lack of indicators to review progress and weak deadlines complicated reviewing progress in implementing the Road Map. Furthermore, outdated and incomplete data from Parties, e.g. the National Implementation Plans, complicates thorough review. Some other critical points for discussion regard the Survey Developing Alternatives to DDT. For example:

- There is no strong relation between the answers of the survey and the Road Map activities
- Some survey questions regard multiple activities
- Different interpretation by participants in the survey should be considered
- Although participation was considerable in the survey, the answers do not represent all Parties and stakeholders involved in the Road Map

6. Highlights and conclusions

To date there is a continued need for the use of DDT for Indoor residual Spraying (IRS) where locally safe, effective and affordable alternatives are still lacking (Road Map 1.2). The DDT register under the Stockholm Convention lists India, Namibia and Ethiopia registered to produce DDT and a total of 17 countries registered to use DDT. Three countries, India, South Africa and Mozambique reported use of DDT, seven not reported use, and the other seven did not submitted report. It should be noted that only India is known to currently be producing DDT and together with Ethiopia and South Africa are the only countries with export/re-export of DDT.

Overall, most significant work is currently being carried out regarding the following areas:

- Assessing and monitoring the global situation
- Implementing GEF projects
- Elimination of DDT stockpiles and waste

Some areas where efforts could be increased are:

- Coordination Road Map
- Raising funds for Road Map activities
- Compiling lessons learned and good practices from projects and programmes using non-chemicals alternatives for control of malaria and leishmaniosis
- Collecting comprehensive data, e.g. NIPs
- Capacity building

According to the WHO Pesticides Scheme (WHOPES) some progress regarding developing chemical alternatives to DDT is being made (Road Map 2.3). The latest data shows a number of industries developing applications for Indoor Residual Spraying (IRS), long-lasting insecticidal nets and mosquito larviciding.

Work with regard to developing non-chemical alternatives to DDT (2.4) is being undertaking, especially by NGOs and regional centres, e.g. in relation to housing and Integrated Vector Management (IVM). However, efforts, such as sharing lessons learned and good practices, are too little.

The Road Map is a good example of strengthening partnerships, which is also an important aspect for the Sustainable Development Goals (Goal 17). Many different stakeholders are involved in the Road Map, e.g. Governments, Inter-governmental Organizations, industry, academia and non-profit organizations.

The GEF has funded a number of projects in relation to collecting repackaging and disposal of DDT stocks (3.2 and 3.3), for example in Guatemala, Belize, Mozambique, Eritrea and Mauritius.

Some further specific conclusions with regard to stockpiles can be made (Road Map 3). The amount of global stockpiles is estimated at 20.000 tonnes, however, the amount is expected to be much higher. The largest stockpiles are located in former Soviet Union countries, Africa and China.

Some difficulties with regard to implementation of the Road Map have appeared the following. A lack of indicators to review progress and weak deadlines complicate taking stock on work (Road Map 1). Another issue for reviewing progress is a lack of comprehensive data available. For example, many NIPs are outdated. Finally, limited funding (Road Map 1.1.4) has restricted the amount of concrete activities in relation to the Road Map.

For the path forward, better coordination of the Road Map would be recommended, taking into account a need for indicators and deadlines as well as increased funds for concrete activities and increased partnerships. Another recommendation would be to increase efforts to obtain more comprehensive data in order to review progress. Proposed next steps toward COP-9 are outlined in the next section.

7. Proposed next steps toward COP-9

The table on the next page, “Road Map activities for 2017-2019 (COP-9) by UN Environment and the Basel, Rotterdam and Stockholm (BRS) Conventions Secretariat in collaboration with partners and subject to availability of resources”, is based on the highlights and conclusions of this report and proposes concrete activities to undertake by COP-9.

Road Map activities for 2017-2019 (COP-9) by UN Environment and the Basel, Rotterdam and Stockholm (BRS) Conventions Secretariat in collaboration with partners and subject to availability of resources

Ref. Road Map – Activities/Areas of Action		Ref. SDG	Activity	Outcome	Responsible actors	Timeline	Budget USD	Source
1	**Establish overall Road Map management and reporting procedures**							
1.1	**Coordinate and implement the Road Map and provide funding**							
1.1.1	Make the provisions for the coordination and implementation of the Road Map, adopt an initial budget for coordination of the Road Map	17	Develop a new workplan of the Global Alliance for 2017-2019 in accordance with the Road Map, define strategies, raise funds and organize meetings	Effective coordinating body for implementation of the Road Map	UN Environment (The Global Alliance), BRS Secretariat	2017 – Onwards	In kind	Workplan
1.1.2	Develop the terms of reference and nominate members of the coordination and implementing body and prepare an initial budget for implementation							
1.1.3	Prepare progress reports to the COP and annual interim reports		Prepare report to COP-8 (completed) and COP-9	Review progress with regard to implementation of the Road Map	UN Environment (The Global Alliance)	2017 - Onwards	In kind	Progress report
1.2	**Prepare assessment reports, monitor developments and evaluate progress (linkages to effectiveness evaluation)**							
1.2.1	Assess and monitor the global situation in terms of production, trade, use (including areas of application and illegal use), stockpiles of DDT (including updating of DDT register) and environmental and human exposures	3, 12, 14, 15	Undertake the DDT Questionnaire (1), collect national report updates (2), collect data from the Global Monitoring Plan (GMP) (3). Assess data from (1), (2) and (3)	Comprehensive overview of the global situation in terms of production, trade, use (including areas of application and illegal use), and environmental and human exposures	BRS Secretariat (DDT Expert Group), UN Environment (GMP)	Ongoing	In kind	DDT Expert Group Report, Effectiveness Evaluation Report
		3, 14, 15	Global Inventory Report on DDT legacy stocks and landfills	Comprehensive global overview of legacy stocks and landfills	BRS secretariat, in collaboration with Green Cross (NGO)	2017	25.000 (budget approved)	Global Inventory Report on DDT legacy stocks and

								landfills
		12	Update the DDT register after COP-8 and COP-9	Overview of countries registered to produce and use DDT	BRS secretariat	Ongoing	In kind	DDT Register
1.2.3	Regularly assess the continued need for DDT for disease vector control and report to the COP	3	Assess the continued need for DDT for disease vector control and report to COP-8 (completed) and COP-9	Evaluation of the continued need for DDT for disease vector control	BRS Secretariat (DDT Expert Group)	Ongoing	In kind	DDT Expert Group Effectiveness evaluation
2.1.3	Establish and coordinate national, regional and global information sharing mechanisms (e.g. on vector resistance mechanisms, best practices in IVM, status of alternatives)	3	Document 3 best practices/case studies are assessed and lessons learned (1) Case of Sri Lanka (IVM), (2) and (3) to be decided	Sharing best practices with regard to alternatives for a transition away from DDT use	BRS Secretariat	2017 (1) 2017 – 2019 (2,3)	45.000 (15.000 per best practice) Budget for (1) approved	Documented best practices
2	**Implement the Road Map**							
2.1	**Strengthen the base of knowledge for policy formulation and decision-making**							
2.1.4	Identify countries still using DDT for vector control, undertake country-specific assessments (epidemiological field data, capacity to introduce alternatives, and implement IVM, motivation and rational for using DDT, opportunities and challenges etc.)	3, 4, 5, 11, 17	Develop and implement 2 national Road Maps (Zambia and Uganda) for the development of alternatives to DDT for vector control and strengthen IVM, including a preliminary review of alternatives DDT and legal, institutional and operational capacity for vector control and a multi-stakeholder consultative meeting	Implementation of alternatives to DDT for disease vector control towards elimination of malaria, enhanced capacity and availability of information for evidence-based decision-making on DDT and other disease vector control products and tools and strengthened capacity to implement IVM projects and activities and for the promotion of non-chemical vector control methods	BRS Secretariat, in collaboration with Biovision (NGO)	2017 - 2018	40.000 (budget approved)	National Road Maps

2.2	**Strengthen country and local capacities to manage insecticide resistance, develop and implement IVM strategies, assess and deploy alternatives**							
2.2.3	Conduct targeted webinars, provided that the technical preconditions are given, and country-level workshops in the language of the respective country based on 2.1.4, disseminate and train relevant staff in the use of the manuals and materials from 2.1.1 as well as the tools and strategies from 2.1.1	3, 4, 11	Conduct at least 1 webinar per year. 2017: (1) "Reducing chemicals for vector control: moving from DDT to the Sustainable Development Goals" by UN Environment (Global Alliance), (2) Non-chemical alternatives (BRS Secretariat) 2018: to be determined 2019: to be determined	Strengthen capacities at a national and local level and among the different Road Map stakeholders on managing insecticide resistance, developing and implementing IVM strategies, and assessing and deploying alternatives	UN Environment (Global Alliance), BRS Secretariat	2017 -2019	In kind	Webinar recordings and notes

8. References

DDT Expert Group, Report of the Meeting of the DDT Expert Group. Rep. 2016. Print. UNEP/POPS/DDT-EG.6/2

DDT Register. Stockholm Convention, Web. Feb. 2017. <http://chm.pops.int/Implementation/Exemptions/AcceptablePurposes/AcceptablePurposesDDT/tabid/456/Default.aspx>.

DDT Expert Group. *Report of the Effectiveness Evaluation on DDT Pursuant to the Article 16 of the Stockholm Convention*. Rep., 2016. Print. UNEP/POPS/DDT-EG.6/INF/2

Evaluation of the Continued Need for DDT for Disease Vector Control and the Promotion of Alternatives to DDT. COP Document. 2016. Print. UNEP/POPS/COP.8/5 http://chm.pops.int/TheConvention/ConferenceoftheParties/Meetings/COP8/tabid/5309/Default.aspx.

Global Monitoring Plan. UN Environment, Web. <http://web.unep.org/chemicalsandwaste/what-we-do/science-and-risk/persistent-organic-pollutants-pops/pops-monitoring/global-monitoring-4>.

Global Status of DDT and Its Alternatives for Use in Vector Control to Prevent Disease. COP Document. 2008. Print. UNEP/POPS/DDTBP.1/2 http://www.pops.int/documents/ddt/Global%20status%20of%20DDT%20SSC%2020Oct08.pdf

Indoor Residual Spraying. Use of Indoor Residual Spraying for Scaling up Global Malaria Control and Elimination (archived). Rep. WHO, 2006. Print.

http://www.who.int/malaria/publications/atoz/htm_mal_2006_1112/en/

Leishmaniasis. WHO, Web. <http://www.who.int/leishmaniasis/en/>.

Listing of POPs in the Stockholm Convention. Stockholm Convention, 2001. Web. <http://chm.pops.int/TheConvention/ThePOPs/ListingofPOPs>.

National Implementation Plans. Web. <http://chm.pops.int/Implementation/NationalImplementationPlans/NIPTransmission/tabid/253/Default.aspx>.

National Reports. Web. http://chm.pops.int/Countries/Reporting/NationalReports/tabid/3668/Default.aspx

Malaria Country Profiles 2016. WHO, Web. <http://www.who.int/malaria/publications/country-profiles/en/>.

Malaria Fact Sheet. WHO, Dec. 2016. Web. <http://www.who.int/mediacentre/factsheets/fs094/en/>.

Pesticide Products under WHOPES Laboratory and or Field Testing and Evaluation. WHOPES, Jan. 2016. Web. <http://www.who.int/whopes/Products_Under_WHOPES_Evaluation_January_2016.pdf>.

President's Malaria Initiative. *Ethiopia – Malaria Operational Plan FY 2014.* Publication. 2014. Print. http://www.pmi.gov/docs/default-source/default-document-library/malaria-operational-plans/fy14/ethiopia_mop_fy14.pdf?sfvrsn=14

Ramos, Adele. "24 Tons of Deleterious DDT Stockpiled by Belize Headed to France for Destruction." *Amandala*. Feb. 2017.

http://amandala.com.bz/news/24-tons-deleterious-ddt-stockpiled-belize-headed-france-destruction-2/

Secretariat of the Stockholm Convention. Sixth Meeting of the Conference of the Parties to the Stockholm Convention. 2013 Web. <http://chm.pops.int/TheConvention/ConferenceoftheParties/Meetings/COP6/tabid/3074/mctl/ViewDetails/EventModID/870/EventID/396/xmid/10240/Default.aspx>.

S*urvey on Developing Alternatives to DDT*. UN Environment, 2017.

The GEF. *GEF Project ID 3614. DSSA Demonstrating and Scaling Up Sustainable Alternatives to DDT for the Control of Vector-borne Diseases in Southern Caucasus and Central Asia.* Web. https://www.thegef.org/project/dssa-demonstrating-and-scaling-sustainable-alternatives-ddt-control-vector-borne-diseases

The GEF. *GEF Project ID 5407. Disposal of Obsolete Pesticides including POPs, Promotion of Alternatives and Strengthening Pesticides Management in the Caribbean.* Web.

https://www.thegef.org/project/disposal-obsolete-pesticides-including-pops-promotion-alternatives-and-strengthening

The GEF. *GEF Project ID 4668. Demonstration of effectiveness of diversified, environmentally sound and sustainable interventions, and strengthening national capacity for innovative implementation of integrated vector management (IVM) for disease prevention and control in the WHO AFRO Region.* Web. https://www.thegef.org/project/demonstration-effectiveness-diversified-environmentally-sound-and-sustainable-interventions

The GEF. *GEF Project ID 4612. Development and promotion of Non-POPs Alternatives to DDT.* Web. https://www.thegef.org/project/development-and-promotion-non-pops-alternatives-ddt

The GEF. *GEF Project ID 3205. Sustainable management of POPs in Mauritius.* Web. https://www.thegef.org/project/sustainable-management-pops-mauritius

The GEF. *GEF Project ID 3987. Eritrea: Prevention and Disposal of POPs and Obsolete Pesticides.* Web. https://www.thegef.org/project/eritrea-prevention-and-disposal-pops-and-obsolete-pesticides

The GEF. *GEF Project ID 3986. Disposal of POPs Wastes and Obsolete Pesticides.* Web. https://www.thegef.org/project/disposal-pops-wastes-and-obsolete-pesticides

The GEF. *GEF Project ID 5816. Environmentally Sound Management and Disposal of Polychlorinated Biphenyl (PCB) - Containing Equipment and Disposal of DDT Wastes, and Upgrade of Technical Expertise.* Web. https://www.thegef.org/project/environmentally-sound-management-and-disposal-polychlorinated-biphenyl-pcb-containing

The GEF. *GEF Project ID 5094. Belize Chemicals and Waste Management Programme.* Web. https://www.thegef.org/project/belize-chemicals-and-waste-management-programme

The Use of DDT in Malaria Vector Control. Rep.: WHO, 2011. Print.http://apps.who.int/iris/bitstream/10665/69945/1/WHO_HTM_GMP_2011_eng.pdf

UN Environment. *Road Map for the Development of Alternatives to DDT.* Rep. 2015. Print. http://web.unep.org/chemicalsandwaste/what-we-do/science-and-risk/persistent-organic-pollutants-pops/phasing-out-ddt/roadmap-alternatives

Vector Control Working Group. Vector Control Working Group, Web. 2017. <http://www.rollbackmalaria.org/architecture/working-groups/vcwg>.

WHO. IARC. *IARC Monographs Evaluate DDT, Lindane, and 2,4-D. IARC*. Web. <https://www.iarc.fr/en/media-centre/pr/2015/pdfs/pr236_E.pdf> National Implementation Plans. Retrieved in February 2017.

World Malaria Report 2016. Rep..: WHO, 2016. Print. http://www.who.int/malaria/publications/world-malaria-report-2016/report/en/

Annex A. Participants in the Survey "Developing Alternatives to DDT"

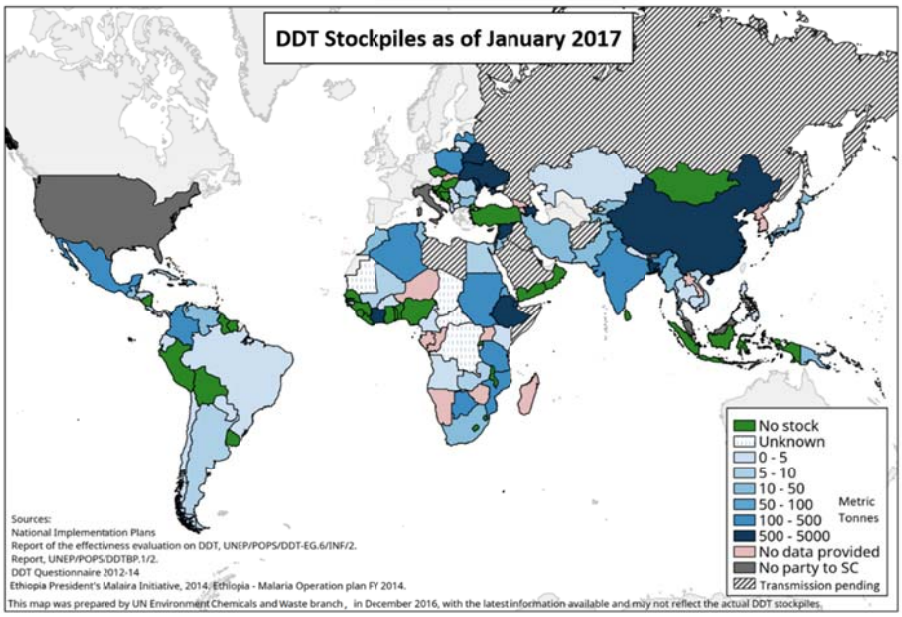
Total responses: 63			
Country representatives: 28	Government agencies: 6	Other Stakeholders: 27	Other: 2
Coverage Percentages			
Coverage out of total parties		16% (28 parties out of total 180 parties)	
Coverage countries out of countries affected by malaria		19% (17 out of 91)	
Coverage out of total parties registered for DDT production		67% (2 parties out of total 3 parties)	
Coverage out of total parties registered for DDT use		35% (6 parties out of 17 parties)	

Participants by UN Region	Country representatives[4]
Africa (12)	Algeria, Benin, Cameroon, Central African Republic, Chad, Eritrea, Ethiopia, Gabon, Lesotho, Mozambique, Nigeria, Senegal
Asia Pacific (6)	Bahrein, India, China, Pakistan, Sri Lanka, Yemen
Eastern European Group (2)	Armenia, Serbia
Group of Latin-American and Caribbean (7)	Costa Rica, Ecuador, Guatemala, Guyana, Mexico, Panama, Surinam
Western European and Others Group (WEOG) (6)	Australia, Iceland, Monaco, Netherlands, Portugal, United States of America
Total: 32	

Implementing stakeholders		Other
Inter-Governmental Organizations (IGO)	United Nations Environment Programme (UN Environment)	Global Monitoring Plan (GMP)
	World Health Organization (WHO)	WHO Pesticide Evaluation Scheme (WHOPES)
	United Nations Human Settlements Programme (UN-HABITAT)	
	Stockholm and Basel Conventions Regional Centres (SCRC/BCRC)	
	Global Environment Facility (GEF)	
Experts	DDT Expert Group	
	Persistent Organic Pollutants Review Committee (POPRC)	
Industry or private sector		
Civil society		
Academia		
Donors		
Multilateral Environmental Agreement (MEA)	Basel, Rotterdam and Stockholm (BRS) Conventions Secretariat	
Multi-stakeholder platforms	Global Alliance (GA) for Alternatives to DDT	
	Roll Back Malaria (RBM) Partnership	
Non-Governmental Organisations (NGO)		
National Government Agency		

[4] By Focal Points to the SC or by a representative of the ministries of national Health, Environment or Agriculture related affairs

Annex C. Global Stockpiles



Countries	Region	Latest Inventory	DDT (tons)	Comments
Mozambique	Africa	12/12/2015	~8	**Collected** in track of Elimination (GEF Project)
Eritrea	Africa	30/06/2012	38.8	**Disposed** (GEF Project)
Mexico	GRULAC	05/11/2011	86.3	**Incinerated** the last stockpiles of DDT.
Guatemala	GRULAC	14/06/2016	15.2	**Collected** in track of Elimination (GEF Project)
China	Asia-Pacific	2010-2012	636	13 tons of DDT emulsion oil and 636 tons of DDT **disposed**
				Organizations
Ethiopia.	Africa	01/10/2016	115	**Disposed**, USAID/President's Malaria Initiative (2017)
Pakistan	Asia-Pacific	25/11/2015	400	**Collected** by Directorate of Malaria Control. Ministry of National Health Services.
Sudan	Africa	01/03/2013	1.6	**Collected**. University of Gezira, Dept. of Pesticides & Toxicol. , Sudan.
Mauritius	Africa	2013-2014	142	**Disposed**, GEF project.
Swaziland	Africa	02/01/2015	Unknown amount	University of Swaziland
Georgia, Kyrgyzstan, Tajikistan	Asia-Pacific	30/06/2016	361.8	**Disposed** Georgia**; Collected** Kyrgyzstan and Tajikistan. Green Cross Switzerland.