MID-TERM REVIEW OF THE ACTIVITIES IN THE

SPECIAL INTERVENTION ZONES (SIZ)

AND

EFFECTIVENESS OF ONCHOCERCIASIS SURVEILLANCE SYSTEMS OF THE

EX-OCP COUNTRIES

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## Acronyms

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<tr>
<td>AFRO</td>
<td>African Regional Office of WHO</td>
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<tr>
<td>ABR</td>
<td>Annual Biting Rate</td>
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<td>APOC</td>
<td>African Programme for Onchocerciasis Control</td>
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<tr>
<td>ATP</td>
<td>Annual Transmission Potential</td>
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<tr>
<td>B.t.H-14</td>
<td>Bacillus thuringiensis serotype H-14</td>
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<tr>
<td>CDD</td>
<td>Community Directed Treatment with Ivermectin</td>
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<td>CMIL</td>
<td>Community Microfilarial Load</td>
</tr>
<tr>
<td>CSA</td>
<td>Committee of Sponsoring Agencies</td>
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<tr>
<td>DEC</td>
<td>Diethyl Carbamazine</td>
</tr>
<tr>
<td>DHMT</td>
<td>District Health Management Team</td>
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<tr>
<td>DNA</td>
<td>Deoxyribonucleic acid</td>
</tr>
<tr>
<td>EPI</td>
<td>Expanded Programme of Immunization</td>
</tr>
<tr>
<td>HKI</td>
<td>Helen Keller International</td>
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<tr>
<td>HSAM</td>
<td>Health Education, Sensitization, Advocacy and Mobilisation</td>
</tr>
<tr>
<td>IEC</td>
<td>Information, Education, Communication</td>
</tr>
<tr>
<td>JAF</td>
<td>APOC Joint Action Forum</td>
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<tr>
<td>LF</td>
<td>Lymphatic Filariasis</td>
</tr>
<tr>
<td>MACROFIL</td>
<td>Macrofilarial Drugs for Onchocerciasis and Lymphatic Filariasis</td>
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<tr>
<td>MBR</td>
<td>Monthly Biting Rate</td>
</tr>
<tr>
<td>MDP</td>
<td>Mectizan Donation Program</td>
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<tr>
<td>MDSC</td>
<td>Multi Disease Surveillance Centre</td>
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<tr>
<td>MTP</td>
<td>Monthly Transmission Potential</td>
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<td>MoH</td>
<td>Ministry of Health</td>
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<td>NGDO</td>
<td>Non-Governmental Development Organization</td>
</tr>
<tr>
<td>NOC</td>
<td>National Onchocerciasis Committee</td>
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<td>NOCP</td>
<td>National Onchocerciasis Control Programme</td>
</tr>
<tr>
<td>OCP</td>
<td>Onchocerciasis Control Programme</td>
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<tr>
<td>OPC</td>
<td>« Organisation pour la Prévention de la Cécité »</td>
</tr>
<tr>
<td>OTD/DDC</td>
<td>Other Tropical Diseases/Prevention and Control of Communicable Diseases</td>
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<tr>
<td>PHC</td>
<td>Primary Health Care</td>
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<tr>
<td>PHU</td>
<td>Primary Health Unit</td>
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<tr>
<td>SAC</td>
<td>Special Advisory Committee</td>
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<td>SIT</td>
<td>Special Intervention Team</td>
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<td>SIZ</td>
<td>Special Intervention Zones</td>
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<td>SSI</td>
<td>Sight Savers International</td>
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<tr>
<td>STG</td>
<td>Short Term General Service Staff</td>
</tr>
<tr>
<td>STP</td>
<td>Short Term Professional</td>
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<tr>
<td>TDR</td>
<td>UNDP/World Bank/WHO Special Programme on Research and Training</td>
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<tr>
<td>TLMO</td>
<td>Transport, Logistic and Maintenance Officer</td>
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<td>TORs</td>
<td>Terms of Reference</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Executive summary

(a) The Onchocerciasis Control Programme (OCP) in West Africa came to a successful conclusion in 2002. In a few programme areas and river basins, however, the entomological and epidemiological situation remained unsatisfactory towards the end of OCP. Such areas were identified as “Special Intervention Zones” (SIZ) for enhanced Community Directed Treatment with Ivermectin (CDT), complemented with vector control in two of the zones. Activities were foreseen for 2003-2007, and the cost covered by unutilized funds from OCP last financial Phase (1998-2002), amounting to US$ 12,098,732. Before closure of OCP, provision had been made for a mid-term review of the SIZ operations, the subject of this report. The review team’s TORs were broadened to cover effectiveness of the onchocerciasis surveillance systems of all ex-OCP countries.

(b) The review team has taken account of the major recommendations of the OCP External Evaluation of 2002, and has perused an extensive set of documents, interviewed key staff at APOC/SIZ in Ouagadougou, and, as an essential part of the process, undertaken country visits to Benin, Burkina Faso, Ghana, Guinea (Conakry), Mali, Sierra Leone and Togo. Other countries - Côte d’Ivoire, Guinea Bissau, Niger, Senegal were covered through interviews of National Coordinators called to Ouagadougou, or via correspondence, and/or document study. The review team’s main findings and recommendations are summarized below, by topic.

General management

(c) To manage SIZ activities, a Special Intervention Team (SIT) was put in place with effect from 1 January 2003. Through a special arrangement with WHO, the Director of APOC, on behalf of AFRO, ensures an overall technical, administrative and financial supervision of SIZ. The structure of SIT is field oriented and the staff stationed in Ouagadougou are the minimum required at SIZ headquarters.

(d) In all countries a National Coordinator, often working on other diseases as well, is the country focal point for onchocerciasis control. This Coordinator heads a National Onchocerciasis Control Programme (NOCP) team, whose members are also involved in other health activities. National Onchocerciasis Committees are meant to assist or support NOCP teams, but such Committees are not functional, though they would be an asset for overall coordination and impetus of onchocerciasis activities at national level (recommendation 1).

(e) No structure for facilitating inter-country collaboration among all ex-OCP countries had been established before OCP’s closure. To fill this gap, the SIT and APOC Management took advantage of the SIZ Annual Review and Planning Meetings in Ouagadougou -- which include National Onchocerciasis Coordinators of SIZ countries, Non-Governmental Development Organisations (NGDOs), and the Mectizan Donation Programme (MDP)-- to invite National Onchocerciasis Coordinators of ex-OCP non-SIZ countries. SIT provides technical expertise and undertakes programme coordination. In addition, some countries organise cross-border meetings on points of mutual interest on onchocerciasis control. Overall, the review team has found that SIZ management contribution to data analysis, operational input as well as scientific and technical guidance to national programmes should be strengthened without delay. (recommendation 2).

(f) The structure of SIT provides for synergy between WHO staff and nationals working on SIZ activities under different arrangements. Many of WHO’s 16 staff working in SIZ are on short-term contracts; and this has introduced an element of precariousness in SIT staffing
situation for late 2006 and 2007 --when a full complement of staff will be needed. A suitable solution needs to be devised by SIZ, jointly with WHO Headquarters (recommendation 3).

(g) In the areas covered by SIZ, the review team has some concerns regarding implementation at the national level of Letters of Agreement between SIZ and Participating countries. Full compliance with WHO’s rules, including financial regulations, is essential (recommendation 4). Also, with regard to equipment and material for the whole ex-OCP area, a plan for gradual replacement of vehicles reaching obsolescence must be drawn up, and possible funding sources identified (recommendation 5).

CDTI implementation

(b) CDTI is the principal strategy of onchocerciasis control, whereby the community itself is in charge of ivermectin delivery, with minimal support from the health system. The SIZ target is 100% geographical coverage and 85% therapeutic coverage with ivermectin (65% in Sierra Leone). With the exception of a few countries, relatively high coverage levels have been achieved since the end of OCP. There is some uncertainty regarding actual coverage rates at some locations, mainly due to population movements across borders and within countries. SIZ management and National Teams should assess the implications of population movements on the validity and reliability of data on coverage rates, and should take steps for improving future coverage (recommendation 6).

(i) The process of ivermectin delivery is performed by community drug distributors (CDDs) according to various modalities. Ivermectin is distributed in one or two annual rounds according to the countries, which entails, in case of two rounds per year, additional workload, logistics and costs. The scientific rationale for undertaking six-monthly rounds needs to be re-examined. Another essential point is that very few women are appointed as CDDs (recommendation 7 addresses both issues).

(j) Compensation in cash or kind to CDDs for their work on onchocerciasis control is given, with very few exceptions, by the communities. Cash incentives are gaining ground. Some other preventive health programmes give monetary compensation as well. Participating countries should introduce consistency of approach, and decide whether and how CDDs should be compensated, without compromising the philosophy of community ownership of CDTI (recommendation 8).

(k) Great importance is attached in SIZ to capacity building, the essential components of which are training (and re-training), and supportive supervision and monitoring, arranged in several countries in a cascading down process--starting with National Onchocerciasis Coordinators, down through district-- and peripheral levels to communities. The review team is concerned about the availability of sufficient long-term funding for training in all ex-OCP countries, and specifically in SIZ countries after SIZ ends. Supervision and monitoring, though assessed as satisfactory overall by the review team, still needs additional resources and consolidation in a number of countries, both SIZ and non-SIZ, especially at the district- and PHU levels (recommendation 9).

(l) As part of capacity building, the importance of advocacy and sensitisation at all levels of the health care delivery system and in the communities, is recognised by countries. IEC materials developed, with the support of NGDOs, are used by NOCP teams for intensive sensitisation activities which need to be continued and reinforced.
Vector control

(m) Vector control activities through aerial larviciding by helicopter in accordance with OCP larviciding strategy, are conducted concurrently with CDTI in limited focal areas, namely the Oti and Upper Oueme river basins (Northern Togo and Bénin). Larviciding, performed under an aerial spraying contract - signed during OCP with an experienced contractor and extended thereafter on a smaller scale- remains by far the highest category of expenditure (some 60% of the SIZ budget). The highly professional SIZ Chief, Vector Control Team in Kara (Togo), and his staff, exercise a tight control on operations, while insisting on quality of maintenance of helicopters and spraying systems.

(n) The review team believes that entomological evaluation of larviciding is properly conducted, according to standards established by OCP. However, conclusions on vector control in the SIZ cannot be definitive after only 2 years, i.e. 2003-2004 (figures for 2005 cannot be fully validated as yet). Generally, in both basins despite the high quality of operations, two years of larviciding does not appear to be associated with expected improvement in the biting densities and intensity of transmission, though figures for 2004-2005 may yet show a promising downward trend. Entomological evaluation has shown peaks of biting densities and infection rates in 2003 and 2004. As was done after OCP, there will be a need for at least two subsequent years of entomological evaluation in the areas concerned, to assess the delayed effect of vector control, which, in any event, will have to be considered with the epidemiological results achieved.

(o) In the non-SIZ ex-OCP countries where CDTI was well in hand and where entomological indicators had been satisfactory prior to OCP closure (in four of six countries), the epidemiological situation has been kept under control and recrudescence has not occurred. Epidemiological surveillance for the detection of any recrudescence is continuing efficiently. The epidemiological surveillance and corrective intervention measures are also being adequately maintained in all but two non-SIZ areas of SIZ countries. Sierra Leone is still at the stage of collection of new epidemiological pre-control data.

(p) Recommendation 10, dealing with vector control, makes a number of points. It advises that: larviciding operations should be maintained during the SIZ programme time-frame, but not beyond 2007; all efforts should be made before the cessation of SIZ activities to identify/confirm the sources of current transmission; a study of contamination of the Upper Oueme by migrant flies from the South (non-SIZ area) as well as an assessment of risk of the Oti basin contamination by Upper Oueme should be attempted and, if conclusive, larviciding patterns modified accordingly; entomological analysis should be done in greater depth; that close collaboration between entomological and epidemiological teams is mandatory; and scientific and operational guidance of SIZ management in Ouagadougou must be significantly enhanced.

(q) The review team also recommends that aquatic monitoring should continue in parallel with vector control, and SIT, as well as national staff, drawing on their experience with onchocerciasis control, must give due attention to the use and effect of agrochemicals on the environment (recommendation 11). On blackfly nuisance control, which is not in OCP/SIZ mandates, SIZ should use its capacity to brief all concerned extensively, while national teams should assess the means used by riverine populations for their collective protection — including chemicals, which, if indiscriminately used, could damage the aquatic environment and fauna (recommendation 12). The means used for protection of individuals, such as repellents of local origin, should be recorded and their efficiency validated as and when feasible.
Surveillance

Depending on the country, epidemiological surveillance is conducted entirely by national teams, with or without SIZ management's technical support. For understandable reasons, the standard protocol established by OCP is not always respected in selecting villages for the visiting rounds. In some countries, additional actions are needed to improve surveillance, while maintaining the ability of national staff to intervening in non sentinel areas as required (recommendation 13). In the SIZ area, epidemiological surveillance indicators (prevalence and CMFL) show good or average results, depending on the country. Non-SIZ countries, for which data are available, show good results.

In the whole ex-OCP area, entomological surveillance relies on the techniques of fly pool-collecting (performed by national teams with SIZ management support in SIZ areas) and fly infectivity analysis through pool-screening. These techniques were designed to replace the costly classical catches-dissections technique and are implemented in the MDSC molecular biology laboratory in Ouagadougou only --hence it is important that MDSC's response capacity be strengthened. For a number of reasons, this sophisticated promising technique, which has not yet proven its effectiveness for decision making, calls for an in-depth reflection on a priority basis, particularly with regard to its relevance and adequacy for SIZ and non-SIZ areas (recommendation 14, which also deals with the need to reinforce the entomological capacity of NOCP teams, taking advantage of the training potential offered by MDSC and SIZ management).

Sustainability

In the post-SIZ era, onchocerciasis control activities will encompass CDTI, intensified where the situation demands, as well as epidemiological and entomological surveillance to ensure that the disease is not resurfacing. In general, Participating Countries have demonstrated remarkable political will for the implementation of these activities and national teams have to varying degrees demonstrated competence and commitment in carrying out their responsibilities. The review team found that onchocerciasis control activities are by and large integrated structurally and functionally at all levels of the health care system. All countries now have in place integrated disease surveillance systems, and have included onchocerciasis in the list of priority diseases targeted for surveillance. Several countries have integrated onchocerciasis with lymphatic filariasis or blindness control.

The process of decentralisation in the countries has been supportive of integration, and has led to the involvement of staff at district and sub-district level in all activities. These staff have received training, have trained those below them, and have accepted responsibility for planning, implementation, supervision, and monitoring of CDTI activities as part of their routine daily activities. Communities have accepted CDTI and provide varying levels of support to the CDDs. These CDDs have multiple roles in community based health activities beyond onchocerciasis, such as the expanded programme of immunisation (EPI), lymphatic filariasis (LF), blindness, Guinea worm and other health education and control programmes.

Integration of CDTI with blindness and LF national programmes, where it has not occurred, should be encouraged, considering the potential efficiency of such associations (recommendation 15).

Partnership among various stakeholders, governments, Merck & Co., Mectizan® Donation Programme (MDP), NGDOs, WHO, and the World Bank, is strong. The main threat to the sustainability is the low and often declining level of government financial contribution to overall project implementation. While it is appreciated that there are competing demands, governments in ex-OCP countries need to clearly identify an appropriate onchocerciasis control budget covering
core expenditures necessary for CDTI sustainability and for prevention of onchocerciasis recrudescence. They should especially ensure that the corresponding funds are effectively made available to NOCP's (recommendation 16, which also highlights the need for Ministries of Health (MoH) to initiate or intensify advocacy towards all partners).

(x) The socio-political environment for onchocerciasis control is changing. On the social side, the risk of loss of alertness to the disease exists, especially with the younger generation which, based on achievements of OCP and subsequent SIZ activities, might not recognise the need to pre-empt recrudescence. On the political side, countries in a conflict or post-conflict situation must be given reference material developed by the African Programme for Onchocerciasis Control (APOC) for similar situations, and SIZ should maintain contact with National Coordinators and other actors in onchocerciasis control down the line wherever possible (recommendation 17 on developing IEC activities adapted to the social environment, and on SIZ's relationship with countries in a conflict or post-conflict situation).

(y) High quality research, results of which were used to modulate the technical implementation of the programme, was a major factor for the success of OCP. Ex-OCP countries should continue the tradition. In particular, countries and SIZ management should give a high priority to operational research, and should systematically identify research opportunities. They should take advantage of their considerable national expertise, and funding available at national and international levels, to develop proposals and implement research activities (recommendation 18).

(z) Highly positive activities and achievements are noted throughout this report. Yet, in taking stock for onchocerciasis control in the ex-OCP area, some notes of caution must be kept in mind and attended to, lest some results could be endangered. First, while the epidemiological results at SIZ level exhibit a good overall picture, some localized sites do not meet the standards and must be carefully followed-up. Second, for entomological results, conclusions on vector control in the SIZ cannot be definitive after 2 years only, i.e. 2003-2004, but it can generally be considered that control of transmission will be difficult now that SIZ areas are no longer isolated, and as long as sources of infection in humans prevail to some significant degree. Third, CDTI is maintaining high standards, though there is some uncertainty about the completeness of geographical coverage and, as an important consideration, there is some fear of a possible decrease of dedication to CDTI sustainability. A weakening of commitment could result from such factors as the decreasing impact of the disease and its memory in the affected communities, a declining interest for onchocerciasis in the face of other priority diseases and control programmes, and a reduction in national budget contributions and external support.

(aa) By the end of SIZ, the five countries concerned are likely to be faced with the need for: continuation of reinforced CDTI wherever required; at least two subsequent years of entomological evaluation using the classical catches-dissections technique, combined with the pool-screening tool in the Togo and Benin SIZ, to assess the delayed effect of the vector control strategy; ongoing assessment of the epidemiological situation in the countries, and addressing a special situation in Sierra Leone where full activities have resumed only in 2005. Epidemiological surveillance for the detection of any recrudescence would also need to continue in the non-SIZ area. In the whole ex-OCP area, entomological surveillance involving the pool screening of a mass of flies for infective parasites, using the molecular biology technique, has to be improved upon. Criteria should be worked out to decide about cessation of CDTI when and where risk of recrudescence has been brought down to acceptable levels. Although most of the countries have integrated onchocerciasis surveillance in their national disease surveillance systems, the indication is that they will continue to need some support to sustain it.
The ex-OCP countries have stated or have shown that continuing inter-country collaboration would be advantageous. Such collaboration could cover a wide range of areas of common concern, including analysis of surveillance and treatment results, action-oriented identification of trends, advocacy for onchocerciasis control and mobilisation of additional resources, and exchange of information including on possible forms of collaboration. Such support and inter-country collaboration will best be facilitated by an organisation already existing within the region with expertise in the common strategy of CDTI, and in sharing experiences across borders. APOC has the operational capability to meet these challenges, and appears to offer the most adequate platform for technical advice, and for organizing an active forum for cross-examination of issues of mutual concern (recommendation 19). Also, APOC will be best suited to harmonise activities of all the ex-OCP countries with its own.

Both SIZ and non-SIZ ex-OCP countries are in need of external support to complement MoH’s budget, which is generally insufficient to ensure the best practice of CDTI, as well as standardized epidemiological evaluation, epidemiological surveillance and appropriate intervention. SIZ Management must invite all NOCP’s to prepare, as early as 2006, national plans of action, with costing and identification of funding possibilities, for post-SIZ onchocerciasis control activities at the country level taking into account the integration of CDTI within the national health services (recommendation 20).
A. Introduction

(i) The Onchocerciasis Control Programme in West Africa (OCP) was closed in December 2002, having achieved its objectives of eliminating onchocerciasis as a disease of public health importance and as an obstacle to socio-economic development throughout practically all of the programme area. However, in limited and defined river basins, the entomo-epidemiological situation remained unsatisfactory after several years of combined vector control and ivermectin (Mectizan®) treatment. These areas therefore qualified for “Special Intervention” and were referred to as the “Special Intervention Zones (SIZ)”. The basins are the Pru in Ghana, the tributaries of the Upper Oti in Benin and Togo (Keran-Karan-Mo), the adjacent Upper Oueme river basin in Benin (as a protection against reinvasion of upper Oti basin), and the basins of Mafou and Tinkisso (including upper Niger) in Guinea. Besides these limited areas, the whole of Sierra Leone, where onchocerciasis control activities were suspended after up to five consecutive years of combined larviciding and ivermectin distribution, was included as a fifth SIZ (Annex 1). The SIZ project duration was expected to be five years from 1 January 2003 to 31 December 2007, and, with the agreement of the Contributing Parties, the estimated cost of US$ 12,098,732 was to be covered by funds of the Phase V of OCP (1998-2002) which remained undisbursed by 31 December 2002. The 5-year time-frame was for achieving a reduction in onchocerciasis indicators to a level which would mean reducing the risk of recrudescence in the zone to a very low level and interrupt transmission as predicted by the ONCHOSIM model.

(ii) The last Joint Programme Committee of OCP in December 2002 endorsed the recommendation that for all five special intervention zones, the principal method of control should be Community Directed Treatment with Ivermectin (CDTI) applied until 2012, reinforced to achieve 100% geographical and at least 85% therapeutic coverage (65% in Sierra Leone). Ivermectin treatment was to be given annually in the Pru in Ghana and Sierra Leone and semi-annually in the remaining three basins. In two of these SIZ, the tributaries of the Upper Oti and the adjacent Upper Oueme, it had been considered to complement CDTI with vector control over a five year period. The rationale for the combined strategy stemmed from modelling studies using local OCP entomo-epidemiological evaluation results. These were said to demonstrate that only this combination could achieve the objective of very low risk of recrudescence within the specified time-frame.

(iii) Of the 11 ex-OCP countries, four have both SIZ and non-SIZ zones, six countries are non-SIZ, while Sierra Leone is completely a SIZ. The general objective of operations in the five SIZs is to bring the entomo-epidemiological parameters to levels which correspond to the OCP standards and which can easily be maintained by the Participating countries, while the objective in the non-SIZ of all ex-OCP countries is to maintain the achievement of OCP. The activities for the SIZ are performed by a Special Intervention Team (SIT), with headquarters in Ouagadougou, and national teams.

The OCP External Evaluation 2002

(iv) The OCP External Evaluation of 2002 assessed OCP achievements and arrangements made for their preservation. The evaluation concluded that Participating Countries were capable of undertaking onchocerciasis control activities after 2002 and maintaining OCP achievements for the foreseeable future. This was, however, predicated on a wide range of factors: maintenance of CDTI activities, ongoing epidemiological and entomological surveillance, data collection and management as well as software maintenance, training and retraining of public health staff working on onchocerciasis, adequate Information Education Communication (IEC), operational research, information sharing at country and inter-country level, and the proposed specific SIZ
activities which the OCP evaluation team endorsed.

(v) Continued collaboration among Participating Countries was expected, supported by the WHO Regional Office for Africa (AFRO), WHO country Representatives, the WHO Multi Disease Surveillance Centre (MDSC), the African Programme for Onchocerciasis Control (APOC), Non-Governmental Development Organizations (NGDOs) and Donors. The evaluation team also found that OCP had facilitated human resources development through training of polyvalent staff who could work on onchocerciasis as well as on other diseases and that, more broadly, OCP had stimulated community-driven health service delivery. Training and fellowships had enabled devolution of epidemiological and entomological surveillance to national onchocerciasis teams. Another finding was that integration within the health service delivery system was stronger at district and sub-district levels than at regional and national levels.

(vi) The major recommendations included training and retraining - with adequate funding - of health staff and others involved in onchocerciasis control, encouragement of operational research at national and local level, creation of National Onchocerciasis Task Forces (NOTFs) on the pattern developed in APOC countries, inter-country cooperation among OCP as well as with APOC countries, and the establishment of a forum within the ambit of APOC (in conjunction with MDSC) to “facilitate periodic stocktaking, data-based discussions of onchocerciasis trends, and the tackling of common technical issues”. The ex-OCP countries themselves would have primary responsibility for all onchocerciasis control activities within their national borders; and the devolved activities would be undertaken as an integral part of national multidisease surveillance and control programmes.

Rationale for the Mid-term review

(vii) The Expert Advisory Committee of the OCP had recommended that the activities of SIZ be monitored annually by an oversight committee 1, with provision for a mid-term review, conducted by a team including relevant external members; as well as a final evaluation in 2007. These evaluations should cover onchocerciasis control activities in all risk zones of the former OCP area.

(viii) In this report, in accordance with its terms of reference (TORs – Annex 2), the mid-term review team presents its assessment of the progress towards meeting the specific objectives of the operations in the five Special Intervention Zones; and its assessment of the effectiveness of the onchocerciasis surveillance systems of the ex-OCP countries. In doing so, the team reached conclusions and made recommendations aimed at improving strategy, structure and operations of SIZ, as well as for follow-up action needed after 2007.

B. The evaluation process

(ix) The review team, consisting of six members, first met in Ouagadougou on 13 and 14 June 2005, with the purpose of discussing and clarifying the Terms of Reference, and drawing up a work plan of activities, including their organization and timing. A list of relevant documents was examined and, based on a broad initial outline of the report, tasks were allocated to team members including the preparation of tools especially to standardize the process and content for gathering data about CDTI. In addition to extensive documentation reviewed and interviews of key staff at APOC/SIZ in Ouagadougou, country visits by team members were an essential part of the process. Not all countries could be covered. Considering the various organisational parameters, the following countries were visited, generally by two members of the team, from

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1 Which is now the Special Advisory Committee (SAC)
August to October 2005: Benin, Burkina Faso, Ghana, Guinea (Conakry), Mali, Sierra Leone, and Togo. Other countries (Côte d’Ivoire, Guinea Bissau, Niger, Senegal), were dealt with through interviews of National Coordinators in Ouagadougou, correspondence, or document study.

(x) Within countries, information was obtained from field observations, and through interviews with stakeholders: National Coordinators and members of National Onchocerciasis Committees; health managers and workers at different levels of the health system; communities (Chiefs, CDDs, community association leaders, villagers, vectors collectors); WHO country Representatives; in-country NGDO Representatives; the MDSC in Ouagadougou; and APOC/SIZ management. The review laid special emphasis on trends and achievements relating to geographical and therapeutic coverage. Other aspects of the programme assessed include capacity building, and country potential for sustaining onchocerciasis control activities beyond 2007.

(xi) Review team members prepared country reports which were analysed centrally by all members, and findings and recommendations consolidated into an overall report at a meeting held in Ouagadougou during the first half of October. The main findings and recommendations were presented to CSA at its 111th session in October 2005.

C. Findings and recommendations

1. Programme management

1.1 Institutional arrangements

1.1.1 A Special Intervention Team (SIT) was put in place with effect from 1 January 2003 to manage the SIZ activities. The SIT discharges its functions under an institutional, operational and administrative framework, embodied in an “Agreement on implementation of residual onchocerciasis control activities (2003-2007)”, which is an adaptation, on a smaller scale, of institutional arrangements prevailing under OCP. The governments concerned in the former OCP area are designated as the “Participating Governments”. Funds are those remaining from the last phase of OCP, as stipulated in Article II of the Agreement:

“Each Contributing Party to the Phase V of OCP [1998-2002], has agreed that the monies contributed by them to the Phase V Fund that are undisbursed by 31 December 2002... shall, unless otherwise provided, be used to finance the carrying out of residual onchocerciasis control activities in the Special Intervention Zones as provided in this Agreement up until 31 December 2007”

1.1.2 Each Participating Government is bound by a set of undertakings, including for providing mutual support on issues requiring intercountry efforts, maintaining the achievements in controlling onchocerciasis, and providing operational facilities so that programme activities could proceed under suitable legal and technical conditions. Such arrangements between the various parties are proving practical and satisfactory, and avoid a heavy institutional machinery (such as that used for OCP and APOC), which would not be warranted by the limited scale of the Programme.

1.1.3 Though formally not in the Agreement, a Special Advisory Committee (SAC) has been set up as part of the management structure and as recommended by the OCP Expert Advisory Committee in 2002. The SAC is composed of a small group of experts who advise the SIT on issues concerning CDTI and vector control, surveillance and evaluation, as well as environmental matters.
1.2 General management

1.2.1 The SIT has been established by WHO AFRO. The arrangement is that:

"Given the secretariat already in existence for the African Programme for Onchocerciasis Control (APOC) in Ouagadougou, it makes most sense from an administrative point that the WHO staff implementing post-2002 control activities in the OCP area be centrally supported and managed by some designated senior staff of WHO implementing APOC but they will be implemented as WHO activities and not under the authority of APOC as such."²

1.2.2 This arrangement has worked as intended. While the Director of APOC, on behalf of AFRO, ensures overall technical, administrative and financial supervision of SIZ, SIZ is relying on APOC for day to day administration, as well as personnel, budgetary and financial support activities. In the Office of the APOC Programme Director, the Coordinator of APOC also fulfils the function of SIZ team leader (TL). A deputy team leader (DTL) works full-time on SIZ.

1.2.3 The structure of the SIT³ is field-oriented, and the staff stationed in Ouagadougou is the minimum needed. For vector control activities, requiring a strong mobilization of funds, a cross border organization, and high technology, WHO/SIZ has entered into an agreement (the Aerial Spraying Contract), with a contractor who had long experience with OCP, and operations are supervised by SIT.

1.2.4 In all countries there is a National Onchocerciasis Control Programme (NOCP) team. These are nuclear teams headed by a National Coordinator who is the country focal point for onchocerciasis control. In most countries, neither the National Coordinators nor the team members work exclusively on onchocerciasis. National Onchocerciasis Committees (NOCs) are meant to assist or support the NOCP teams, but, even where they exist, they are not functional.

**Recommendation 1**

*In view of the importance of national-level coordination and support for onchocerciasis activities, each country should have a functional National Onchocerciasis Committee or an equivalent apex body to ensure that the programme is adequately supported.*

1.2.5 Since some National Coordinators are working on other diseases as well (e.g. lymphatic filariasis and blindness), their dedication to and availability for onchocerciasis is not always guaranteed, even though it is essential for programme success. Their responsibilities on onchocerciasis include overall management and organization of programme activities, advocacy and sensitisation, communication with stakeholders, encouragement of ownership at lower levels, delegation of responsibilities, and financial accountability. The NOCP team itself, of small to medium size, includes medical and administrative/finance personnel, sometimes also members responsible for IEC, data analysis, as well as for epidemiological and entomological surveillance. National Coordinators have followed the CDTI system of utilizing staff at various administrative levels, from MoH to the communities, for training, monitoring, sensitisation, and mobilization, with feed-back upwards for taking corrective action.

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² Document IPC23.4 (a), Executive Summary, point « p. »
³ Document IPC23.4(a). Figure 3
1.2.6 SIT’s highly specialized staff facilitate coordination and funding of SIZ activities. The formal link between SIT and the five countries, for CDTI as well as for entomological and epidemiological evaluation, is established under Letters of Agreement (LoA), signed between WHO and the concerned governments, an arrangement which has proven its value since OCP times.

1.2.7 Every year, a Review and Planning Meeting is held at SIZ headquarters, to discuss all points of common concern and to formulate recommendations with the participation of SIZ management, National Coordinators, partner NGDOs, a number of national entomologists, and National Coordinators of the ex-OCP countries. The report of the Review and Planning Meeting is considered by the Special Advisory Committee (SAC).

1.2.8 Most countries organize their own annual reviews of onchocerciasis control activities, convened by NOCP teams, and usually supported by NGDOs.

1.2.9 The SIZ plan of action places high importance on the organization of annual meetings between endemic countries sharing a common border. Such meetings have several advantages: (i) to appraise and make decisions about potential threats to epidemiological and entomological gains, that may occur because of cross-border factors; (ii) to harmonize control activities for persons who may miss treatments repeatedly because of frequent movements across borders; (iii) to exchange views and experiences for mutual benefit.

1.2.10 Benin and Nigeria held a meeting in 2003 to start a joint study on impact of ivermectin, so as to synchronize CDTI activities at the border and for data exchange. Togo and Benin have met twice since the closure of OCP with the purpose of reviewing activities for 2002/3 and developing a plan of action for treatment of the eligible population in border villages. A meeting is planned between Sierra Leone, Liberia and Guinea for January 2006 with funding support from Sight Savers International.

Issues of concern

1.2.11 In some of the countries visited, it appeared that overall technical assistance received from SIZ headquarters in Ouagadougou fell short of expectations. This applies particularly to the SIZ operational bases in Kara and Parakou, where stronger input from Ouagadougou was expected in the conduct of aerial operations and, especially, for analysis of trends and interpretation of entomological and epidemiological data collected.

1.2.12 Though the staff stationed in Ouagadougou is the minimum needed, the review team considers that more visits from SIZ management to the field could be undertaken. Contact with national programmes is largely limited to annual Review and Planning meetings in Ouagadougou, and participation in SAC annual meeting. Reinforcing these contacts through field visits by SIZ management would be mutually beneficial. The review team acknowledges that visits currently taking place to the field by the Chief Drug Distribution and Training, stationed in Kara, are part of the answer.

Recommendation 2

SIZ management’s contribution to data analysis, and provision of operational advice as well as scientific and technical guidance to national programmes should be strengthened without delay, if necessary with the support of temporary consultants, in an attempt to increase the likelihood of achieving SIZ objectives during the remaining two years of SIZ activities, while seeking all possible solutions to improve the entomo-epidemiological results.
1.3 Human resources

1.3.1 There is a synergy between WHO staff and national staff working under different arrangements (Annex 3 - SIT Organogram: all posts shown filled). The WHO staff comprises the Team Leader of SIT and 16 staff members: 4 in Ouagadougou, 9 in Kara and 3 in Parakou. This core WHO staff is reinforced by national staff working with the governments of Benin and Togo, associated to SIT under the respective LoAs. Furthermore, in each of the five SIZ countries, National Coordinators have a link with the SIT structure. In the former OCP area, national staff who used to work on OCP programmes in the framework of the then National Teams, in particular entomologists and entomologist technicians, are generally deployed in onchocerciasis work today.

Issue of concern

1.3.2 For budgetary reasons, all WHO/SIZ staff, professional and general service, are working under a WHO short-term contract status (respectively “STP” and “STG”), which is less costly than a more favourable status, i.e. “fixed-term” giving better job security and benefits. In addition to the problem of insecurity of tenure, the short-term status of staff is likely to soon come into conflict with WHO policies that state that after 4 years, short-term contracts must be converted into fixed-term, or the incumbent’s contract must not be renewed. Two key professional officers and a large proportion of the general service staff are in this situation and should, according to WHO policy, leave the organization by the end of 2006 if no satisfactory solution is found. Therefore, there is an element of precariousness in SIZ staffing situation just when full staff strength will be required for the last year of SIZ operations.

Recommendation 3

SIZ management should find a means for retaining all staff under WHO contracts until the end of SIZ, either by changing their status from short-term to fixed-term, or by seeking another suitable solution jointly with WHO Headquarters. If additional funds are required, the matter should be referred to CSA.

1.4 Budget and finance

1.4.1 The operations of the SIZ are financed, with the agreement of the Donors of OCP, from the reserve of the OCP Trust Fund. The total budget foreseen for SIZ amounts to US $ 12 098 732. Aerial larviciding -though there is only one operational and one back-up helicopter - remains by far the highest category of expenditure. It absorbs some 53% of the total SIZ budget for the 5 years, based on actual expenditures thus far and on forecasts for the remaining SIZ period. To this should be added costs of related activities, e.g. a proportion of the cost of entomological evaluation of vector control activities, maintenance of the hydrological network, and related staff travel, bringing the total for aerial larviciding to some 60% of total programme costs. CDTI-which rests on broader national efforts and partnerships in all five SIZ countries - accounts for 10%, and all other activities (mainly staff, travel, research, general operating expenses, training, equipment) for the remaining 30 % of the total SIZ expenditures.

For the sake of completeness, it is noted that a similar problem affects 9 professional staff in APOC

In 1973, the World bank established a Special Account for the Onchocerciasis Control Programme which receives all contributions, other than local cost payments by Participating Countries. Pursuant to a Fund Agreement between the World Bank and WHO, the Bank transfers funds to WHO when needed.
1.4.2 SIZ funds are administered by APOC staff (supported by the SIZ team in Kara) according to WHO/APOC Administrative and Financial procedures, within the wider WHO Rules and Regulations. Under approved SIZ budgets and established procedures, National Teams submit proposals to SIT annually with detailed budgets, for SIT’s appraisal and approval. Once the proposals are approved, Letters of Agreement (LoAs) are signed by WHO/SIZ and the respective Ministry of Health, outlining the purpose of the agreement and detailing its budget. Under established disbursement procedures, payments by SIT are staggered, subject to the submission of monthly financial returns, and technical reports which enable SIT to assess good performance. For Kara and Parakou operational bases the process is different in that the transfers are internal to SIZ, made directly from Ouagadougou to SIZ bank accounts.

**Issue of concern**

1.4.3 Though administration of the Programme is based on a long-standing practice inherited from OCP, some difficulties are still being encountered. Depending on the country, there are cases of late submissions or no-submission of financial returns; non compliance with WHO administrative and financial procedures; and unsatisfactory funds management. Through SIT feed back after analysis of monthly returns, countries are advised of any discrepancies, and held accountable as appropriate.

**Recommendation 4**

NOCPs, in implementing Letters of Agreement, must ensure full compliance with WHO rules, including punctual and accurate submission of monthly returns, while SIZ management must continue to exercise control and provide targeted training to overcome the difficulties encountered.

1.5 Equipment and material

1.5.1 OCP had a strong transport and telecommunication infrastructure, some of which remained with SIZ. For the OCP vehicle fleet, a central garage with staff and facilities needed for full maintenance and repair was run in Ouagadougou; these staff also supervised similar but smaller units in the field. The garage in Ouagadougou has continued on a reduced scale, serving jointly the WHO Representative’s Office, APOC, MDSC and SIZ on a cost-sharing basis. A total of 37 vehicles (including mainly land cruisers but also a small number of trucks used in the framework of aerial operations for larviciding and for transporting fuel) are serving SIZ today. They are stationed in Kara, Parakou, Sierra Leone (mostly in Makeni), and Ouagadougou (a small number). Also, there is one vehicle in each of the five SIZ country capitals for the National Coordinator. An efficient system is in place for follow up and analysis of the state of repair of vehicles, spare parts and fuel, under overall supervision and monitoring of a Transport, Logistics and Maintenance Officer (TLMO). A number of vehicles, donated by OCP, are still used by National Coordinators or for field work, but most are gradually reaching obsolescence. In several places, motorcycles are provided by NGDOs.

1.5.2 The SIZ bases of Kara and Parakou are convenient, respectively built and upgraded during OCP, on government land. They include offices equipped with computers, telecommunication facilities, and laboratory material. In Parakou there is a laboratory and in both there are impressive sets of OCP meaningful archives. The base in Makeni (Sierra Leone) which was severely damaged during the conflict has been repaired, including the garage. A new and a back-up generator were provided by SIZ, in response to unreliable power supply in the country.
1.5.3 Points of concern are on the resources needed for maintenance and replacement of vehicles, which are essential for undertaking activities in CDTI and surveillance. Also, some parts of the equipment and other physical assets could be up-graded.

**Recommendation 5**

(a) Each country should systematically plan for the gradual replacement of vehicles provided by OCP; and for this, sources of funding should soon be identified and secured.

(b) Plans should be made for the disposal of furniture and equipment in Kara and Parakou at the end of SIZ; in particular, attention should be given to preservation of archival material with historic and practical value for the continuation of CDTI.

2. CDTI Implementation

2.1 Introductory remarks

*Historical background*

2.1.1 Community Directed Treatment with Ivermectin (CDTI) is the principal strategy for onchocerciasis control in Africa. This strategy calls for communities to take primary responsibility to manage the ivermectin distribution process at community level, with basic support from the health system.

2.1.2 In 1987, the approval of ivermectin, and its subsequent donation by Merck & Co, Inc. for as long as needed, represented a breakthrough for onchocerciasis control. Accordingly, in that same year, treatment with ivermectin was introduced into OCP as an additional strategy, supplementing vector control.

2.1.3 National mobile teams delivered the drug with technical and financial support from OCP. Non Governmental Development Organizations (NGDOs) were the first to introduce community-based approaches for delivering the drug. These community-based delivery processes have evolved into the widely accepted method of CDTI.

2.1.4 In a community-directed system, the community itself is in charge of delivery, with minimal support from the health system. Communities select the most appropriate community distributors to administer the drug; determine the schedule and modalities for collecting the drug from the designated peripheral health unit; decide on the schedule for treatment, return of unused tablets and of registers showing distribution results; and on ways to support distributors.

2.1.5 The CDTI strategy was proven to be cheaper than using mobile teams, more effective for achieving desired therapeutic coverage rates and more sustainable. By the close of OCP, CDTI had become institutionalised in most of the program basins, and over 7 million people in approximately 20,000 villages were under annual treatment. CDTI is now the main strategy for onchocerciasis control in ex-OCP (including SIZ) and APOC countries. The expectation for SIZ countries in particular, is that the existing CDTI structures established during OCP would be reinforced through SIZ-related activities and would become self-sustaining by 2007. This section of the report reviews essential aspects of CDTI’s outputs and processes: coverage results, drug availability, community involvement, advocacy and sensitisation, and capacity building activities.
2.2 Coverage results

2.2.1 The SIZ target is 100% geographical coverage6 and 85% (Sierra Leone 65%) therapeutic coverage7 with ivermectin. Averages of coverage achieved for countries with SIZ and non-SIZ areas are indicated in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Countries with SIZ Areas</th>
<th>Geographic Coverage %</th>
<th>Therapeutic Coverage %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002</td>
<td>2003</td>
</tr>
<tr>
<td><strong>Togo</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZ 1st Round</td>
<td>98.7</td>
<td>98.8</td>
</tr>
<tr>
<td>SIZ 2nd Round</td>
<td>100</td>
<td>94.6</td>
</tr>
<tr>
<td>Non SIZ</td>
<td>98</td>
<td>99.8</td>
</tr>
<tr>
<td><strong>Benin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZ</td>
<td>88.0</td>
<td>99.7</td>
</tr>
<tr>
<td>Non SIZ</td>
<td>80.0</td>
<td></td>
</tr>
<tr>
<td><strong>Guinea</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZ</td>
<td>98.5</td>
<td>99.0</td>
</tr>
<tr>
<td>Non-SIZ</td>
<td>99.0</td>
<td></td>
</tr>
<tr>
<td><strong>Ghana</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZ</td>
<td>73.6</td>
<td>100</td>
</tr>
<tr>
<td>Non SIZ</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sierra Leone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZ</td>
<td>65.9</td>
<td>28.3</td>
</tr>
</tbody>
</table>

For the SIZ areas in particular, the overall coverage results may mask discrepancies among various regions, districts and peripheral health units (PHUs). However, with the exception of a few countries, relatively high coverage levels have been achieved since 2002. Although further review of the data is required, the trend in therapeutic coverage seems either stable or slightly improving over the years. Though the therapeutic coverage target for non-SIZ areas averaged 65% all countries have exceeded this target. In Ghana, there has been marked improvement in reported therapeutic coverage rates from 2002 to 2004. The low coverage rates in Sierra Leone can be explained in part by the fragile health and community structures following a decade of internal conflict and in part by incomplete data. In SIZ as in non-SIZ areas, coverage figures are usually similar for a given round of CDTI.

**Issue of concern**

2.2.2 The review team recognizes the effort made by National Teams to produce annually updated listings and complete census of all communities eligible for treatment. However, anecdotal information gathered suggests that it is likely the eligible population is underestimated in some countries because of movements across and within countries, as well as emergence of new settlements. If this is the case, the reported geographical and therapeutic rates are overestimated.

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6 Geographical coverage: number of communities treated in a given treatment cycle over the total number of communities targeted for treatment (this should be expressed as a percentage)
7 Therapeutic coverage: number of people treated in a given treatment cycle over the total population (this should be expressed as a percentage).
Recommendation 6

**SIZ management and National Teams should explore the implications of population movements on reliability and validity of coverage rates, and should reach decisions about mechanisms for improving future coverage. Some possibilities include increasing cross-border collaboration for treatment and allocating sufficient funds for regularly updating data on settlements at risk within countries. SIZ management may also consider allocating a few unused helicopter flight hours to record previously unidentified villages.**

### 2.3 Ivermectin procurement and availability

**2.3.1** The health systems in SIZ countries, though at varying stages of decentralization, facilitate the distribution of ivermectin from the central to the village level. All SIZ countries except Benin receive ivermectin duty free, with the support of WHO country offices for customs clearance.

**2.3.2** In some SIZ countries, the movement of the ivermectin follows the drug distribution channel from the central level to districts, and finally to PHUs. In the case of Sierra Leone and Ghana, ivermectin is delivered directly from WHO to the National Programme, and from there to districts. Communities collect ivermectin from PHUs. No major problems were reported regarding ivermectin availability, except for some shortages in Sierra Leone and Guinea in 2004, resulting in non-treatment of some community members. In Guinea, corrective action was taken.

### 2.4 Ivermectin delivery

**2.4.1** In Togo, Benin and Guinea, ivermectin is distributed through two annual rounds. The delivery mechanisms used by communities vary, depending on community preference and characteristics. Some CDDs deliver the drug from house to house, while others distribute from a central point, sometimes under the village Chief supervision. In some cases they use printed community registers for census taking and reporting. The time taken for distribution varies from 3 to 15 days. The distribution period may be even longer for hard-to-reach communities. In some instances, distributors make up to three visits to households and/or settlements to improve on geographical and therapeutic coverage. The great majority of CDDs are men because women are often not consulted for making known their interest in serving as CDDs. Another reason might be that many women are not literate, thus not meeting a prerequisite. Where local customs and traditions permit, communities are gradually paying attention to the need and benefits for appointing women as CDDs. In Guinea, women CDDs proved to be an advantage for improving adherence to the exclusion criteria, since pregnant women are more likely to disclose their status to a woman CDD. Presently there are very few refusals among community members eligible for ivermectin.

**Issue of concern**

**2.4.2** The rationale for two annual rounds of ivermectin based on the ONCHOSIM model simulation is not well understood at the NOCP level. It is sometimes questioned whether absenteees during the first round are indeed present at the second. Furthermore, NOCP leaders stress the cost of the second round, in terms of workload, logistics and compensatory allowances to CDD's. The advantage of a single round is obvious in places where a lymphatic filariasis control programme is also carried out, and where ivermectin could be distributed only once per year, together with albendazole, at a lower cost.
Recommendation 7

(a) National teams, with SIZ support should check the parasitological relevance of a second CDTI round in various epidemiological contexts (using accurate measurements of Mf loads 6 and 12 months after treatment). In selected communities, national teams should check the proportion of individuals who attend only the first round, the second round and those who attend both. National teams should estimate the extra cost of a second round of CDTI.

(b) Communities should be encouraged to appoint women CDDs.

(c) Where there is no combined CDTI/LF National Programme, both teams should work out together the feasibility of jointly carrying out one annual round for distributing both ivermectin and albendazole, thus necessitating only one additional CDTI round.

2.5 Community involvement

2.5.1 The sustainability of CDTI is very dependent on the extent to which communities take ownership of the process, make necessary decisions, and accept overall responsibility for the organisation of CDTI activities.

2.5.2 Most community members express satisfaction with the programme and are willing to continue distributing and taking the drug for many years. Communities demonstrated high awareness about onchocerciasis and the need and benefits for regular treatment with ivermectin. They have shown extraordinary adherence to ivermectin and its perceived effects beyond onchocerciasis, awaiting distribution eagerly and expressing it to primary health units. Most communities selected two CDDs, in some cases more, and in very few instances only one. Exceptionally, CDDs are not selected by the communities themselves. Some communities compensate CDDs out of community funds managed jointly with the health units, others provide in-kind (e.g. transport, food) incentives to CDDs, while others do not provide CDDs with any type of incentives. Communities which do not offer incentives argue that CDDs should be willing to render services voluntarily to their kin. The CDDs are generally held in high esteem, and some have been nominated for other health activities (e.g. Vitamin A distribution, EPI, Guinea worm control programme) for which incentives are given.

Issue of concern

2.5.3 In most countries the subject of incentives is of increasing concern for onchocerciasis control. A few preventive health programmes have cash incentive schemes for community workers while others, such as the onchocerciasis program do not. Distributors are expressing dissatisfaction about this inconsistency in remuneration policies. The practice may lead to demotivation of some CDDs and some others’ outright refusal to participate.

Recommendation 8

(a) Participating Countries should make their own decisions regarding whether and how CDDs will be compensated. When the decision is in favour of some kind of incentive, communities should work out their own mechanisms for providing suitable incentive packages so as to maintain community ownership philosophy of CDTI.

(b) Each Participating country should discuss the long-term implications of having some programmes giving out monetary compensation for community workers, while others do not.
Countries will need to enforce a consistent policy if programmes are to be sustainable at the community level.

2.6 Advocacy and sensitisation

2.6.1 CDTI programmes and their supporting partners recognise the need for communities to have a clear understanding of the disease, the treatment strategy, and the need for continuing treatment over several years. Consequently, IEC materials have been developed and NOCPs have carried out intensive sensitisation activities at all levels of the health care delivery system, as well as locally in communities.

2.6.2 NGDOs have supported the development of IEC materials and have helped train health workers and CDDs in their use. The materials and activities developed include posters, flip charts, radio jingles and health talks. In some countries, the Health Education Unit of the Ministry of Health is involved in the development of IEC materials.

2.6.3 Some countries, in their annual review and planning meetings, update and sensitise stakeholders about program progress, results and challenges. In some countries as well, much work has gone into sensitising political leaders at all levels. Teaching about onchocerciasis and CDTI is integrated into the curriculum of health professionals in some countries.

2.7 Capacity building

2.7.1 From the beginning of the SIZ Programme, high priority was given to capacity building, established as a third strategy element, after CDTI, and CDTI combined with aerial larviciding:

"The third strategy element will be in capacity building. There will be training of specialist staff mostly in respect to CDTI and making national entomologists responsible for post-treatment evaluation. Such staff will also provide intercountry assistance whenever required".

Training (including re-training), supportive supervision and monitoring, HSAM activities (Health education, Sensitization, Advocacy, Community mobilization), are essential pillars of capacity building.

Training and re-training

2.7.2 SIZ has maintained the momentum of OCP, which had already emphasised the importance of training as a key element in transfer of activities to Participating countries. Training under SIZ's aegis, including re-training covers a wide range of target groups, with special emphasis on CDDs and health workers, medical staff in charge of the districts and health centers, as well as entomologists and entomology technicians, including those involved in post-treatment evaluation activities. Depending on the target audience, training has covered all aspects of CDTI (planning, implementation, monitoring and supervision), as well as such aspects as computer use, including for data collection, management and analysis.

2.7.3 Train the trainers schemes have supported a cascading process from national to community level. For this, as a starting point, National Onchocerciasis Coordinators from the five countries covered by SIZ, as well as some District Medical Officers, were trained or re-trained in Ouagadougou. The process has continued from district to peripheral levels where trained nurses

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8 Onchocerciasis Control in Special Intervention Zones including Sierra Leone in the OCP Area - Plan of Action and Budget (Document IPC23.4(a), September 2002 – Executive Summary, paragraph "j")
have in turn trained CDDs. More than 20,000 CDDs have thus been trained since 2003. In some places, training on onchocerciasis and lymphatic filariasis is also given to nurses and doctors, to facilitate integration of the two programmes.

2.7.4 In support of these activities, SIT uses training material developed by APOC, in the form of modules which are packaged according to target audiences and purpose, and have been found useful both for training and enhancing sustainability. The training modules used cover the disease, CDTI, partners, adult education, monitoring and supervision. A manual titled "Community-Directed Treatment with Ivermectin (CDTI)" issued in 1998 has proven to be a valuable tool in the field, as well as a practical guide for trainers. Specific workshops, including for planning and mobilization, as well as lectures, supported by IEC visual and written material and Power Point presentations, are also organised in the framework of CDTI strengthening and sustainability.

2.7.5 For financing of the above measures, the SIZ contribution is made under a specific budget line captioned "Training/Re-training (CDTI, entomology)" and as separate provisions clearly spelled out in the Letters of Agreement as an essential part of each project. Two other sources of funding are the governments and NGDOs, though accurate data on their contributions are not available. However, the review team found examples of NGDOs actively supporting and financing capacity building activities. In Sierra Leone, Helen Keller International (HKI) has supported, and co-sponsored with SIT, two 5-day train-the-trainers sessions, respectively in 2003 and 2004. In several countries, HKI has also introduced picture boxes, i.e. sequential sets of posters to illustrate the disease and its control. In non-SIZ areas in Togo, Sight Savers International (SSI) is financing activities connected with training of CDDs, as well as training and refresher sessions for health workers. SSI in Togo is also providing support in related fields such as monitoring and supervision of CDTI, project evaluation and annual review, as well as provision of equipment. The "Organisation pour la Prévention de la Cécité" (OPC) supported the training of nurses in Guinea, who in turn have trained a significant number of CDDs for CDTI as well as early detection of blindness.

2.7.6 Re-training, following training by OCP and at present by SIZ, should remain a comparatively important feature, to help ensure full effectiveness of onchocerciasis activities in the short and longer-term. Provision of new/additional training may also remain an ongoing requirement as CDTI expands, and also in view of the rotation of health personnel whereby outgoing staff is replaced by staff who may not have received training in onchocerciasis.

2.7.7 Ongoing training is a major requirement for ensuring sustainability. Besides adequate human resources, sufficient financial resources are and will continue to be required to maintain the momentum achieved. Expenditures on capacity building are mainly for travel, per diem, IEC and other support material, and miscellaneous expenditures (including stationery). However, it is by no means certain that sufficient funding for training will be available once SIZ programme is closed.

Monitoring and supervision

2.7.8 Monitoring and supervision is another important aspect of capacity building for health care delivery, including for CDTI. The Ministries of Health for SIZ countries support and promote a cascading and integrated supervision policy, according to which health workers combine the supervision of onchocerciasis with the supervision of other health activities. Under this arrangement, peripheral health unit staff provide supportive supervision to CDDs. On the whole, the evaluation team found that supervision in all countries is done reasonably well.
2.7.9 In Guinea, Togo and Benin, a "stratégie avancée" (a strategy for carrying out health services to the remotest places, with health service packages brought by the PHU staff) is currently being used and has the advantage of providing an opportunity for more frequent contacts between the PHU and CDDs. Such a strategy will be an asset to CDTI, which has de facto been following a similar approach. In Guinea, in addition to supervision of CDDs by PHU staff, communities undertake self-monitoring to assess distribution process and results after each distribution round, and make decisions for improvement.

Issues of Concern

2.7.10 Reporting remains an issue for some SIZ countries. PHU staff express frustration about the accuracy and timeliness of CDD reports (oftentimes, the overall reporting process is delayed due to late submissions of reports by CDDs).

2.7.11 Overall, monitoring and supervision is assessed by the review team as satisfactory for the majority of SIZ countries. In some cases, however, supervision can be an issue for distant communities, especially when funds for covering logistical requirements are limited.

2.7.12 In one country, monitoring and supervision was found to be the weakest link in the CDTI process; national and regional supervision were not strategic, as they do not deal with emerging field issues. Supervision of community distribution is inadequate.

Recommendation 9

(a) NOCPs should determine the reasons for the delay in meeting reporting requirements on the part of CDDs and take appropriate action. These reasons could include lack of logistical support or deficiencies in training and/or supervision which need to be corrected.

(b) NOCP and SIZ management should re-assess and increase the budget allocation for monitoring and supervision so as to improve oversight in hard-to-reach areas.

(c) The NOCPs assessed as weak in the supervision for onchocerciasis control should establish the causes, understand the effect on programme effectiveness, and take remedial action that supports supervision of onchocerciasis as part of an integrated system of health care management.

3. Vector control

3.1 Introductory remarks

3.1.1 Aerial larviciding started in March 1977 in the Keran-Kara-Mo river basins as parts of Phase III-East, together with neighbouring Pendjari (upper Oti) and Alibori, Mékrou and Sota rivers (right bank tributaries of river Niger). Entomological results had never been satisfactory on these three basins until 1988, when the OCP "Western extension" 9 covered the adjacent Oueme (including upper Oueme and Mono entire river basins). Improvement in the entomological situation was hampered up to 1993 by a treatment policy that included unrealistic suspension periods. Energetic measures (reinforced treatments, supervision and monitoring) were launched by 1997, and resulted by the early 2000's in an overall improvement in entomological parameters, except in some areas of residual transmission (on Keran-Karan-Mo and the upper Oueme).

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9 i.e. geographical extension of the programme to Western Mali, Guinea, Guinea Bissau, Senegal and Sierra Leone
3.1.2 The basic OCP larviciding strategy is applied in the SIZ, without change. It requires weekly applications, on all productive *S. damnosum* breeding sites, of appropriately formulated insecticides accurately dosed for selective action without irreversible damage to aquatic environment. This latter requirement necessitates the use of sophisticated airborne gauging devises and weekly measurement of river discharges through a network of 19 water-gauges maintained by the Benin and Togo national hydrological services, and monitored by the SIZ team.

3.1.3 During the dry season, ground larviciding replaces aerial larviciding on small tributaries, or in exceptional events when helicopter flying is not feasible. Furthermore, during the flood period, ground larviciding has been maintained on dam spillways in some ten villages in Northern Benin, and performed by the Parakou operational base.

3.2 Management of aerial operations

*Overview*

3.2.1 The two essential budget components are aerial operations (36%) and purchase of larvicides (17%). These figures abundantly show the need to exercise utmost care in the managerial aspects of aerial larviciding, so that, once policies are established and operations planned accordingly, optimum cost-effectiveness is maintained at all times. Three essential aspects that need close monitoring are the aerial contract; management of aerial activities within the set targets; and the purchase of larvicides as well as jet fuel and lubricants. For each aspect, the evaluation team believes that concerned staff have solid understanding and control, in the line of OCP's achievements and legacy of effective management of vector control activities.

*The contract for aerial operations*

3.2.2 Under the guidance of WHO Headquarters, with active input from SIZ, and as a follow up of arrangements made under OCP, negotiations were carried out for the extension of an Aerial Spraying Contract (signed in August 1995), to make the necessary adjustments for undertaking a much more limited operation, covering the SIZ areas designed for vector control. The extension of the contract is for three years, 2003-2005. Under the arrangements, payments are made on a pro-rata basis for flying time, with a minimum number of hours per year guaranteed to the contractor (in the present case, 636 for Oti and Upper Oueme). This minimum number of guaranteed hours has thus far not been exceeded.

3.2.3 OCP and the contractor had a long experience of working together and, in a rational move, it has been agreed that aerial operations for the two remaining years, i.e. 2006-2007, would be entrusted to the same company, forgoing a bidding procedure which had prevailed under previous contracts. This also recognizes that the company has developed a *de facto* monopoly in this highly technical field. The evaluation team has noted that, in this situation, concerted efforts are made by WHO (both at HQ and APOC/SIZ), to keep the costs as low as possible for the next two years. A cost audit is being initiated by WHO, since the cost per hour requested by the company for the new contract exceeds a pre-determined amount.

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10 As well as the Bioko focus in Equatorial Guinea, in the framework of vector elimination projects in APOC

11 This is in line with the Agreement presently in force, according to which « ... the price per helicopter flight hour (US$ 1225) shall be adjusted upwards, if and to the extent the contractor can demonstrate that the overall cost to be incurred by the Contractor in conducting the aforesaid residual Aerial Spraying
Management of aerial activities

3.2.4 On the institutional side, cross-border overflights and landing rights are provided for in the “Agreement on implementation of residual onchocerciasis control activities 2003-2007” signed by WHO with the five “Participating Governments”. Provision is also made for customs and tax exemption on “the equipment and supplies including spare parts, fuel, lubricants, insecticides ...” 12. For undertaking vector control activities, the SIZ operational staff has been selected amongst OCP staff (after that programme’s closure), and the OCP operational base has been kept in Kara along with its equipment. Consequently, aerial operations are managed on the spot with high professionalism and concern about cost efficiency. Also, the aerial contractor has retained its aerial base close to Kara, as well as the services of their most experienced pilots and mechanics. With one helicopter (and one as a back-up) for the SIZ operation, a maximum of 2835 km of rivers are treated each week. SIZ insists on quality of maintenance of helicopters, as well as maintenance and correct gauging of the spraying system. Detailed weekly and daily itineraries, as well as insecticides to be used according to the rotation strategy, remain fully in the hands of the Chief, Vector Control Team (CVCT) in Kara and his staff, who regularly take part in actual flying and spraying operations, carried out in accordance with the reinforced strategy implemented in OCP since 1997. More generally, in the whole operation, problems are solved pragmatically thanks to the positive relationship established with the contracting company and its on-site staff. Regular review meetings take place in Ouagadougou.

Management of larvicide and jet fuel

3.2.5 The larvicide rotation strategy inherited from OCP has been continued. The insecticide consumption for each of the five insecticides used in 2003-2004 (Temephos, B.t. H-14, Permethrin, Pyraclofos and Etofenprox) varies each year according to the local and seasonal hydrological conditions. Following the long practice developed by OCP, suppliers are well known to SIZ and WHO HQ, and the best prices are negotiated. The existing stocks will allow for treatments up to the first half of 2006; orders have already been placed to complement the stock for each insecticide for the whole year.

3.2.6 The companies deliver larvicide in Kara, wherefrom it is taken by SIZ truck to various storage points throughout the treatment area, placed under the responsibility of the respective communities. In Kara, where calculations originate, a set of computer simulations help avoid either excessive or insufficient orders. Computerized scenarios are also used based on stocks and foreseen consumption, so that no larvicides are left over at the end of 2007. SIZ has been using supplies left over by OCP including in other countries, with a significant loss incurred in a conflict zone, entailing peak purchases in 2004. Otherwise, losses and thefts are minimal, below a 5% threshold tolerated by WHO auditors.

3.2.7 The jet fuel (Jet A1) for helicopters is purchased locally by SIZ Kara, with final approval, support and payment from Ouagadougou. Orders are based on the consumption, the residual stocks of the preceding period, and the expected number of flight hours. Tax exemption is availed of by the WHO Representative. The fuel is delivered at a central point (Parakou), and then moved by SIZ truck to the aerial base in Kara. Stocks are sufficient and take account of contingencies. Here too, attention will be paid by SIT to ensure that no fuel and insecticide are left over after 2007. The real issue is the steady increase in cost of fuel. The review team has been assured that the budget for fuel was likely to be sufficient, and special care would be taken by staff to monitor fuel stocks.

Operations has increased, as confirmed by an independent verification mechanism to be negotiated and agreed by the parties in good faith.” (Section II B)

12 As well as ivermectin
3.3 Entomological evaluation

The process

3.3.1 Entomological evaluation of the impact of larviciding is using the standard technique of catches-identifications-dissections developed and routinely used in OCP for decades. Accordingly, biting flies densities are expressed in MBRs and ABRs (monthly and annual biting rates, respectively) and amounts of transmission estimated in MTPs and ATPs (monthly and annual transmission potential, respectively). Sixteen fly-catching sites are monitored weekly, bi-monthly, or occasionally.

Entomological results

3.3.2 For assessing entomological results, only 2 full years can be considered, namely 2003 and 2004. Figures are available at mid-2005, but they are not representative of the entire year. Preliminary figures for the period July-September 2005 became available in October and had not yet been fully analysed.

3.3.3 Biting densities (see Annex 4, first chart)

- In the Oti river basin, on the Keran-Koumongou, Annual Biting Rates (ABRs) have been decreasing between 1999 and 2002, and, in 2003, showed a peak attributable to high rainfalls; in 2004, they were brought down to figures comparable to those prevailing at the end of OCP.
- On the Kara, after a similar peak in 2003, ABR's also decreased to figures comparable to those at the end of OCP.
- On the Mo, ABRs were low until 2001; but interruption of OCP larviciding on Volta Lake tributaries and Southern Togo river basins resulted in an ABR peak in 2002, which could not be fully restored in 2003-2004, though the situation had improved. On the 3 river basins, the declining trends observed in ABR's in 2004 seem to be confirmed and even amplified in 2005.
- In the upper Oueme river basin, low ABR's had started to increase by 2000; interruption of larviciding on mid- and low Oueme river basin at the OCP closure was associated with a high peak in 2003, also recorded in 2004 and in July-August 2005. Heavy rainfalls in 2003-2004 and the resulting floods, higher than previous years--and reactivation of small breeding sites on tributaries which had remained dry for years--are also likely to have contributed to the ABR 2003 peak.

3.3.4 Intensity of transmission (see Annex 4, second chart)

- In the Oti river basin, on Keran-Koumongou, the rough ATPs decreased but did not fall below the threshold of 100 during 2002 to 2004, except on upper Koumongou in Benin. The situation is far better on the Kara river where ATPs have been kept well below the tolerable limit during the same period. ATPs were kept low on the upper Mo while, on the mid-course, they fell to tolerable values in 2004 after a very high peak in 2003. The figures available for 2005 indicated a promising picture for ATPs on all three river basins.
- On the upper Oueme river basin, ATP values rose by 2003, and peaked in 2004 far above the 100 threshold. The 2004 values had already been reached or exceeded at the end of August 2005.
- The picture looks better if corrected ATPs or savanna ATPs are considered, except at peak periods of biting densities (rainy season 2003) and in the Oueme basin where
corrected figures also exceeded 100. It needs to be mentioned here that this threshold was established for savanna type of transmission, and there is no corresponding threshold for the forest type. Indeed, there is always a proportion of forest flies in the catches, higher in rainy season on the upper Oueme river. Also, drawbacks have occurred in the past in molecular biology identification of L3.

Overall appraisal of entomological results

3.3.5 The review team considers that the entomological evaluation of larviciding is properly conducted, according to the standards established by OCP, and under the close supervision of highly qualified ex-OCP staff. The results are adequately compiled, updated and analysed in Kara, to satisfy the needs of operations on weekly, seasonal and annual basis.

3.3.6 Considering the natural annual variations in blackfly densities and *O. volvulus* transmission, enhanced by combined vector and therapeutic control, conclusions on vector control efficiency in the SIZ cannot be definitive after 2-3 years only, and have to take account of the two river basins, Oti and Upper Oueme.

3.3.7 In the Oti tributaries river basin the succession of OCP by SIZ did not lead to a worsening of the entomological situation in spite of the fact that it marked the termination of the focus isolation; the 2002 ABR figures were kept at similar level, either satisfactory (upper Koumongou, Mo and Kara) or not (Keran, lower Mo); promising ABR decrease in 2004 have to be confirmed on lower Mo and some Keran sites.

3.3.8 The case is different on the upper Oueme basin where the ABR and ATP situation gradually deteriorated as early as 2000 and did not improve with the inception of SIZ treatments. Here, it still remains at an intolerable level, even allowing for some likely forest transmission. Considering the synchronism of the ABR and ATP peaks with the heavy rains, and the presence of extremely large and productive breeding sites downstream on the Oueme, the review team had recommended an experimental treatment of the mid-Oueme breeding sites during the rainy season of 2005, to check the impact of this potential source of reinvasion (this impact has already been suspected in 2003). Unfortunately, in 2005, the decline in flooding was exceptionally early and abrupt, and, because of this factor, the result would have been inconclusive.

3.3.9 Generally, in both basins, two years larviciding has not brought the expected improvement in biting densities and intensity of transmission, despite high quality operations. This is probably because of recontaminations, mainly during the rainy season, by outside flies, partly of forest origin (seasonally, part of the transmission (fly infection) is also of forest-type, especially on the Oueme).

3.3.10 These entomological results need to be considered along with the epidemiological results, keeping in mind that the impact of vector control takes time to become noticeable through epidemiological evaluation.

3.3.11 Though some results date back to a few years, it can be observed that on the Keran-Kara-Mo basins, CMFLs are decreasing everywhere and stand below the acceptable threshold. The prevalence figures are also decreasing, except in a few sites where recrudescence was observed (Mo, Sansargou); though in too many cases they still stand over 10 or 20%. On the Oueme basin, the prevalences and CMFL trends show a decrease, to very low figures.

3.3.12 These epidemiological results may indicate a positive impact of combined CDTI and vector control a few years ago, so that consideration may be given to corrected ATPs, especially on the Oueme. Concurrently, fly infections indicate still infected human populations, either at the
source of fly movements or at the arrival sites. In the Oueme basin, this reservoir is likely to be found southwards, in mid-Oueme non-SIZ areas; in the Keran-Kara-Mo basins external reservoirs could also exist, but the prevalence figures are locally such that there remains a possibility of high ATPs and the risk of recrudescence.

**Issues of concern**

3.3.13 The annual biting densities and transmission intensities could not be adequately controlled everywhere in the SIZ and may have a delayed and adverse temporary impact on the epidemiological situation after SIZ closes.

3.3.14 The origin of flies responsible for residual transmission peaks of local or imported origin is not circumscribed and may rest in all adjacent major river basins which were previously treated by OCP.

3.3.15 Despite excellent work carried out at the Kara Operational base, better multi-annual and scientifically-based integrated data analysis is needed.

3.3.16 No attempt has been made to estimate amounts of L3 per 1000 parous flies. However, such estimates could help to understand the risk for the biting flies to get infected over time, depending on the magnitude of the human reservoir of microfilariae.

**Recommendation 10**

(a) Considering the known Keran-Kara-Mo basin conditions, vector control can well be considered as the umbrella which will ensure protection against transmission of onchocerciasis, to be accompanied by reinforced CDTI and, hopefully, a reduction in human infection. Consequently, larviciding operations (necessarily aerial ones) should be maintained in Keran-Kara-Mo with the optimal cost-effciency during the SIZ programme.

(b) In the Oueme basin, where the risk of continued transmission is low (though not nil), it should be ascertained what part of transmission is imported by southern flies, and what would be the increase in the risk of contamination of upper Keran-Kara-Mo basins if local production of flies were reactivated on the upper Oueme river basin. A study of the risk of contamination of the upper Oueme from the South should be attempted as soon as possible, along with a similar study of the contamination of the upper Keran-Kara-Mo basins by the upper Oueme.

(c) Should the Oueme basin experiments prove conclusive, thought should be given to modifying the larviciding pattern, keeping the cost in mind. Should this modification result in guaranteed flight hours not being used for aerial larviciding, such hours could be used to assist the national teams in the prospection of new human settlements in areas where the geographical coverage is suspected to be deficient.

(d) Continuing vector control operations in the post-SIZ era should not be envisaged, considering that in non isolated areas vector control can never be fully effective.

(e) In general, all efforts should be made before the cessation of SIZ activities to identify and characterize the local or external sources of persisting transmission, considering that the necessary field investigations will no longer be feasible using only national resources after the closure of SIZ activities.
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(f) Entomological analysis should be expedited, more in-depth, including an examination of the relationship between blackfly densities and control operations, physical factors, as well as fly populations. Infection rates should also be better linked to fly population characteristics, therapeutic coverages, and epidemiological trends.

(g) For mid- and long-term analysis, close collaboration between entomological and epidemiological teams is absolutely necessary, and the scientific and operational input of the SIZ management in Ouagadougou must be significantly enhanced.

(h) When sufficient data is available, new analysis using the initial mathematical model should be considered to make forecast on the suppression of the risk of recrudescence more reliable.

3.4 Environmental aspects, including nuisance

Aquatic monitoring

3.4.1 Aquatic monitoring in the SIZ is presently restricted to areas of Northern Togo and Benin where vector control was maintained after the end of OCP. Such monitoring will be continued until the end of 2007, after which no more chemical insecticides will be used for vector control unless countries implement chemical blackfly nuisance control. Three sampling stations were selected for invertebrate monitoring: on the Keran, on the Kara, and on the Oueme. Aquatic surveillance started in 2004, and is performed by the SIT. The methodology and protocols are those used for aquatic monitoring in OCP areas, as approved by the former Ecological Group of OCP.

3.4.2 According to the results obtained on aquatic invertebrates, the impact of insecticides used in the SIZs operational zones is ecologically acceptable. The insecticides used do not adversely affect the general functioning of aquatic systems.

Issues of concern

3.4.3 Agrochemicals are increasingly accessible and used by farmers. Their use for illegal fishing has been reported many times by hydrobiologists and by other reliable sources. Their effects may be catastrophic on the aquatic fauna.

3.4.4 From the strictly environmental point of view, the success of onchocerciasis control may be in some way jeopardized by an unsustainable use of the freed land, as demonstrated in a pilot study conducted on the Leraba by OCP in 1994. The destruction of riverine forests and the soil erosion resulting from changes in land use, as well as water pollution by agriculture chemicals or by human wastes, are matters of concern for the sustainable development of the land.

3.4.5 In many SIZ and non SIZ countries, OCP had developed national expertise in aquatic monitoring. In most cases, because of the drastic reduction of chemical control these trained people are no longer associated with onchocerciasis activities.

Recommendation 11

(a) Aquatic monitoring has to be maintained as long as vector control continues

(b) National teams and SIT should be invited to collect information on the use of various pesticides, either for protection against blackfly nuisance, or for illegal fishing. The expertise of national staff trained in aquatic monitoring may be applied to environmental monitoring in
relation to a large-scale use of agrochemicals, now that the skills are no longer needed for onchocerciasis control.

Nuisance control and assistance to countries

3.4.6 *S. damnosum* massive biting is a strong nuisance and sometimes an obstacle to open air activities in several African regions, as other blackflies are in other parts of the world. In various African regions, riverine populations have developed individual protection means including the use of repellents originating in the local pharmacopoeia, especially in Guinea, where a traditionally used oilment (the *Gobi* oil) has been subjected to preliminary pharmacological studies.

3.4.7 For many years the villagers were told that onchocerciasis was associated to blackflies. Actually, during OCP, the blackflies density decreased considerably where chemical larviciding occurred, and the disease disappeared. Now people are faced with the recrudescence of blackflies bites, and even though blackflies no longer transmit onchocerciasis, their reappearance was perceived by populations as a comeback of the disease. People in charge of CDTI now have to sensitize villagers to the new situation.

Nuisance management

3.4.8 After OCP had begun to reduce its aerial larviciding network, nuisance caused by recrudescence densities of biting *S. damnosum s.l.* female flies had been reported by populations and administrative authorities during the rainy season in several large river valleys. Similarly, complaints also came from populations residing in valleys outside the SIZ. This is a matter of concern for all health services leaders, who are pressed by local political authorities for some palliative action through river larviciding.

3.4.9 However, larvicide applications performed by non specialists both in a careless fashion and for a prolonged period could carry enormous risk of environmental pollution. In response to public concerns, OCP, many years ago, had suggested low cost ground application techniques to communities wishing to take action against blackflies, and had recommended two insecticides only, which present low environmental hazards (*B.t.* H-14 and Temephos). SIZ and APOC may provide technical support to countries in this respect.

Recommendation 12

Although nuisance control was not in the OCP and consequently the SIZ mandate (nor in the APOC mandate), it is recommended that exhaustive briefings on the subject be given in the countries by the SIZ technical managers at appropriate levels; such briefing should draw attention to the necessarily high costs of nuisance control.

4. Surveillance

4.1 Epidemiological surveillance

Introductory remarks

4.1.1 Epidemiological surveillance and evaluation, allows the appraisal and timely follow up of the status of the disease in populations, both on clinical and parasitological aspects. In the areas under CDTI, it also allows appraisal of the impact of ivermectin on transmission.
4.1.2 Prior to the closure of OCP, a network of sentinel villages suitable for epidemiological monitoring, covering most of the onchocerciasis foci (particularly first-line villages), was established in each country. The network was divided into 3 batches, each covering all the country river basins, and to be evaluated every 3 years. The method used is the one standardised in OCP, based on calibrated skin snips applied to selected sample population groups. Acceptable thresholds are a maximum adjusted prevalence rate of 5%, and a CMfL below or equal to 0.5. The DEC Patch test is yet to become operational, despite the hope it had previously aroused.

4.1.3 Depending on the country, surveillance is carried out entirely by national teams themselves or by mixed teams (SIT, including nationals). The costs are borne by SIZ for the SIZ areas, and by countries themselves (usually supported by partners: WHO/AFRO, NGDOs) in non-SIZ areas. Former OCP staff who have joined national health systems (e.g. in Mali, Guinea, Ghana), are often among the national staff involved. National teams also carried out additional epidemiological evaluations in villages surrounding sentinels villages, or in areas of suspected unsatisfactory CDTI results.

Results

(a) In SIZ AREAS

4.1.4 Results of the last epidemiological evaluations are presented in Table 2 below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th># of Villages evaluated</th>
<th>Prevalence</th>
<th>CMfL</th>
</tr>
</thead>
<tbody>
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These overall results are good for Benin and Guinea. For Ghana, the results are average. For Sierra-Leone, the epidemiological indicators are a cause for grave concern, as they reflect the situation of a country which was not treated over a decade or so.

(b) In non-SIZ areas

4.1.5 The epidemiological surveillance operations are on the whole well conducted and decentralized in the non-SIZ countries (Mali and Burkina-Faso are cases in point). Examination of data collected under the various indicators used for assessing the situation (prevalence and CMfL) reveals generally good results. In non-SIZ areas of SIZ countries, the process still requires additional means and financial support.

Issues of concern

4.1.6 Epidemiological surveillance is the most important tool for monitoring the evolution of onchocerciasis, both in the SIZ and non-SIZ areas and the national teams are technically competent to carry out this work of primary importance. However, this activity is hampered by a number of factors: insufficient compliance with the three-year periodical rounds for the same
villages, increasing refusal of skin snip by some persons, and scarcity of needed financial resources and materials.

4.1.7 In the SIZ areas, evaluation results are often insufficiently analysed, and are not collated with entomological indicators and CDTI results. In the whole ex-OCP area, SIZ and non-SIZ, there is no indication of criteria to be used to decide about cessation of CDTI.

Recommendation 13

(a) All efforts should be deployed to ensure continuation of epidemiological surveillance to the same extent, level of responsiveness, and quality that prevailed during the OCP period. It is essential that the national teams, in consultation with SIZ, strictly adhere to the initial protocol for epidemiological evaluation, while maintaining the ability to intervene in non-sentinel areas as needed. Any change in this protocol should first be discussed with SIZ management. The national teams must maintain their technical, logistical and financial ability to continue with the epidemiological evaluation during and after SIZ.

(b) In particular, it is imperative that all villages originally scheduled for epidemiological evaluation in 2006 be visited.

(c) In SIZ countries, results of the epidemiological evaluation should be carefully analysed against CDTI coverage and entomological results.

(d) Criteria should be worked out (by countries, SIZ Management and other onchocerciasis specialists) for decision on the cessation of CDTI in SIZ areas, in the non-SIZ areas of SIZ countries and in the non-SIZ countries.

4.2 Entomological surveillance

Introductory remarks

4.2.1 Entomological surveillance allows identification and quantification of the parasite in the vector populations, and early detection of any potential transmission of the disease in a given focus.

4.2.2 The presence of national entomologists, often of good repute, must be underscored in most of the countries. The technique used in SIZ-areas and ex-OCP countries is that of pool-screening (mass-catches of S. damnosum female flies, and pooled appraisal of O. volvulus infection in flies through molecular biology techniques). Pool-screening was developed and is implemented exclusively in the Molecular Biology Laboratory of the Multi Disease Surveillance Centre (MDSC) in Ouagadougou, hence the importance of MDSC response capacity which is still to be fully developed. Pool-screening aims to replace the catches-dissection-identification technique consistently used by OCP and to develop an early warning system, faster than the one provided by epidemiological evaluations. In all SIZ and non-SIZ countries, a network of catching points has been set up by the OCP, MDSC and SIZ. Collection of blackflies is undertaken by village capturers. The infectivity threshold was set at 0.5% (at present out of 6000 flies).

4.2.3 The classical catches-dissection (without pooling) technique - which was used for a long time by OCP - is time-consuming and costly, and used occasionally only in ex-OCP countries (Togo and Guinea) for specific evaluations in critical situations.

4.2.4 The latest data from pool-screening show results below the infectivity threshold (0.5% in all zones, SIZ and non-SIZ). However, these data are too patchy: in 2003, the
results of only 8 capture points (of which 4 in SIZ) are available, out of a network of over 50. In 2004, results relate to two countries only: Guinea (no interpretable results) and Benin (where some results only are interpretable). No data is available for Ghana since 2002. These irregular results reflect numerous practical problems linked to the overall setting up of the entomological surveillance. The lack of synthesis does not allow for drawing definitive conclusions.

Results

4.2.5 The most substantive results were obtained for Sierra Leone, where ATPs (crude and corrected) of 2003 and 2004 are far above the threshold of 100.

Issue of concern

4.2.6 The pool-screening network is not operating well in any of the countries visited. It showed a number of deficiencies: village capturers not given either incentives or sufficiently clear instructions, difficulties in reaching the requested 6,000 flies per batch, problems in collecting and shipping batches in due time, and, of particular importance, delays up to several months in returning results of testing and analysis. Up to now, nowhere has this initially promising tool been of use for evaluation of operations and decision making, and some countries have interrupted the fly collections in 2005. It cannot be used as an early warning system in its present form.

Recommendation 14

(a) SIZ management, MDSC, national coordinators and other experts in onchocerciasis control should urgently and intensively discuss the relevance and adequacy of the pool-screening technique for SIZ and NOCP operations. Given that an early warning system is of interest for several countries, if pool-screening is retained, its application should be considered at an intercountry level by a suitable coordinating and operational structure.

(b) The entomological capacity of the NOCP teams in the field should be maintained and reinforced in terms of staff and resources for field-based evaluation. The training potential offered by MDSC and SIZ management should be fully taken advantage of before the SIZ programme ends.

5. Sustainability

5.1 Introductory remarks

The employment of CDTI as the main strategy for post-OCP onchocerciasis control, and the necessity to continue treatment for several years beyond the life of OCP and SIZ, has brought to fore the importance of sustainability. Various factors affect CDTI sustainability: integration, capacity building, community participation, partnerships and funding, political and social environment, among others. Onchocerciasis control, including epidemiological and entomological surveillance, needs to be integrated within the countries' health care systems. The current economic situation in most of the countries highlights the need for partnership with donors for effective implementation of activities. Countries themselves need to take leadership in planning and defining a suitable role for partners, while at the same time giving concrete expression to their own commitment by allocating sufficient resources, and effectively monitoring and supervising planned activities.
5.2 Integration

5.2.1 In the present review, integration was considered in the context of the degree to which onchocerciasis control and surveillance had become an essential part of the routine functioning of the health services in the countries, and the degree to which collaboration existed among various disease control activities.

5.2.2 Essentially, integration of onchocerciasis into the health services has been achieved in all SIZ as well as some non-SIZ countries (Burkina Faso, Mali, Senegal). At the central level (MoH), onchocerciasis control is included in the national health plan and national budget under the Directorate of Disease Control or Public Health, which is also responsible for other priority diseases. Thus, some of the National Onchocerciasis Coordinators are also responsible for diseases like lymphatic filariasis or blindness control, or have other responsibilities such as Regional Medical Officers. Structurally, onchocerciasis control has been successfully integrated in some countries with either the national programme for prevention of blindness (Guinea) or the national lymphatic filariasis control programme (Benin, Ghana, Mali). The process is starting in Burkina Faso and Sierra Leone. In a few countries, at the central and district levels, onchocerciasis is included in the list of diseases for integrated disease surveillance. Epidemiological and entomological surveillance for onchocerciasis, however, is still carried out by NOCPs.

5.2.3 The process of decentralisation and integration within the context of the health sector reform in many of the countries has facilitated CDTI, and in some cases onchocerciasis surveillance at the regional and district levels. Staff carry out onchocerciasis control as part of their normal routine activities. Onchocerciasis control activities are planned for, implemented and reported on by the District Health Management Team (DHMT), using pooled human, financial and material resources. Some countries designate one DHMT member as an onchocerciasis focal person, who also has other responsibilities, either at the district or the PHU level.

5.2.4 Functional integration of CDTI is the greatest at the PHU level, where the staff are the link between the health services and the communities. The staff plan CDTI activities, carry out sensitisation and mobilisation of communities, train, monitor and supervise CDDs, as part of their routine disease control activities.

5.2.5 Another kind of integration in CDTI occurs at the community level, where a number of CDDs are also involved in other community-based health activities, such as immunisation, as well as control of malaria, eye care, Guinea worm, vitamin A distribution, lymphatic filariasis control, and Reproductive health education.

Issues of concern

5.2.6 Some countries have not carried out structural integration of onchocerciasis control with other control programmes at the national level, and still maintain separate onchocerciasis, lymphatic filariasis, and blindness control programmes. Thus, they did not attempt to integrate NOCP with other community-based disease control programmes.

5.2.7 Integration of CDTI activities with other community-based health programmes is not systematic, and is more in the way of “added on” activities for CDDs. This carries the risk of overload and of disrupting well organized community-based programmes.
**Recommendation 15**

(a) Integration of CDTI with blindness and lymphatic filariasis national programmes, where it has not occurred, should be encouraged, considering the potential efficiency of such associations. The expected synergy between CDTI, blindness and lymphatic filariasis control with other health programmes especially at the peripheral and community levels, should be emphasized to potential donors.

(b) The SIZ management should take stock of the results of studies conducted in several APOC countries in the field of integration of CDTI with other health activities at the community level, bring the information to the NOCP's of ex-OCP countries, and support them to document own experiences with integration.

### 5.3 Partnership support including funding

5.3.1 The partnership structure which served OCP well has been maintained. Current partners include Donor Countries, Participating Countries (including affected communities themselves), the World Bank, the World Health Organisation, Merck & Co, Inc., and NGDOs.

5.3.2 Governments are central to partnership at the national level, and provide continued support to onchocerciasis control as part of their national responsibility for public health management. In the SIZ, in terms of funding, their contributions are either in the framework of LoAs, or in the wider context of country onchocerciasis control activities. In the former OCP area, government contributions vary from country to country, and includes salaries of staff, functioning costs, information systems and other equipment, premises and utilities and such advantages as customs and tax exemptions on ivermectin and purchases for the programme. Throughout, all staff of the Health Services involved in the Programme, who undertake other activities as well, are paid by the government. One government spent significant amounts in 2003 and 2004, respectively for epidemiological and entomological surveillance since OCP closure, and presented results to JAF; the amount, however, was on the decrease in 2005. For a number of governments, actual disbursements are lower than provisions in budget lines, and delays are experienced in disbursements of funds pledged.

5.3.3 All the NGDO partners are the same for onchocerciasis control and blindness prevention. They have played an important role in CDTI in ex-OCP countries. The organisations involved include Helen Keller International (HKI), “Organisation pour la Prevention de la Cécité” (OPC) and Sight Savers International (SSI). Although effective partnership with NGDOs is well established in some countries, it is just starting in others, on the basis of agreements to be reviewed at annual intervals. Partners provide support to countries on a wide range of specific activities such as training, sensitisation and mobilisation, equipment, IEC material, supervision and monitoring, annual review exercises and cross border meetings between countries. The NGDOs are committed to fulfilling their obligations as agreed, provided they can mobilise the resources needed. The relationship between the NGDOs and other partners has been good. Their presence has enabled expansion of CDTI beyond the ex-OCP boundary and, given their long commitment, may be expected to provide continuing support when SIZ would have come to an end.

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13 It must be remembered that the funding of SIZ is from the residue of what was contributed by Donor Countries under OCP.
5.3.4 In a number of countries, the WHO country office has provided technical and financial support to the onchocerciasis control programme and its integration with other disease control activities.

**Issues of concern**

5.3.5 Sustainability depends on adequate funding, including for the longer-term. A full picture of cost of activities and sources of funds in each country would be of great practical use in the sustainability perspective. To the extent that contributions are known or can be estimated, trends for government contributions specified for onchocerciasis are towards decline in a number of countries, precisely at a time when it must be sustained so as to extend and enhance support for onchocerciasis control beyond 2007. In general, there is always the danger that current and emerging health priorities might reduce the funding base for onchocerciasis control.

5.3.6 Capacity building, with emphasis on training and re-training CDDs and supervisory staff in programmes, should feature prominently among priority expenditures that must be assured in the framework of CDTI sustainability. Funding for capacity building will be an asset for the cascading process of service delivery and disease control required to be maintained or reinforced as appropriate. Also, entomological and epidemiological surveillance must be considered as essential activities which should not suffer for lack of funds. Decline of government contributions, and any shift in health priorities, are a concern in respect of these activities.

**Recommendation 16**

(a) Governments in ex-OCP countries should clearly identify an appropriate onchocerciasis control budget covering core expenditures necessary for CDTI sustainability and prevention of onchocerciasis recrudescence, and especially to ensure that the corresponding funds are effectively made available to NOCP’s. More generally, SIZ management and NOCPs should analyse all partners’ contributions, including future funding prospects, and take early action as required to ensure that adequate funding is available for the implementation of CDTI as long as necessary.

(b) MoH’s should initiate or intensify advocacy toward NGDO’s or other partners having interest and experience in onchocerciasis, and/or blindness and filariasis control, as well as in community-based approaches to health and development programmes, thus taking advantage of the synergy between onchocerciasis and other control programmes to enable mobilisation of new resources and expansion of the donor base.

5.4 Social and political environment

5.4.1 In the OCP era, there was high awareness across all age groups about the consequences of onchocerciasis and of good compliance with the treatment offered. At present, in spite of the strong dedication of the communities to CDTI and ivermectin distribution, the social

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14 Recommendation 5 of Review and Planning meeting of the activities in the Special Intervention Zones (2004), reads: "For the sake of transparency and to clearly show partner contribution, the meeting recommends to WHO/SIZ to add to the agenda of review meetings, and item on financial reporting to be presented by the coordinators, with emphasis on sources of funds and the cost of activities"
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environment for onchocerciasis control is changing. Excessive publicity about success of onchocerciasis control may be one cause for weakening commitment. The risk exists that the younger generation, especially in areas where onchocerciasis was not a public health problem, will not be sufficiently alert to the disease and not recognize the need to pre-empt its possible recrudescence. The cultural acceptance of and demand for ivermectin may be a compensating factor to some extent.

Issues of concern

Special case of Sierra Leone and Côte d’Ivoire

5.4.2 A stable social and political environment is an important pre-requisite for efficient health care delivery and for sustaining the delivery of services over time. Participating SIZ countries which have enjoyed stable political environment have by and large achieved and sustained near-optimal geographical and therapeutic coverage rates. In post-conflict countries, for example Sierra Leone, the initial gains made during OCP were lost with the outbreak of internal conflict. In 1988, the prevalence rates ranged between 47% and 88%, and had significantly declined during OCP, to acceptable values in most river basins with control activities. The gain was reversed to such an extent that in 2003, the highest prevalence rates could still peak at 80% for endemic communities along the most infested river basins.

5.4.3 In Côte d’Ivoire the programme has lost all its equipment and some trained personnel. There is no institutional memory for CDTI, onchocerciasis control activities were suspended in part of the country, and government allocation to onchocerciasis control has reduced significantly. Epidemiological surveillance carried out in January 2005 in a Southern Extension created by OCP in 1979, and forest zones, indicates a prevalence rate up to 41% and 41.46% respectively (average 9.46%).

Recommendation 17

(a) Participating countries should consider the social environment when developing IEC activities. Messages and materials need to be strong, clear and consistent about the disease and the relevance of annual treatment with ivermectin to avoid recrudescence.

(b) APOC management should make available to SIZ reference materials about onchocerciasis control experiences in post-conflict areas, to enable countries, such as Côte d’Ivoire and Sierra Leone, adapt this material to their circumstances. Contacts should be maintained with National Coordinators, NGDOs and other actors in onchocerciasis control down the line wherever possible in spite of conflict.

5.5 Research

5.5.1 High quality research, results of which were used to modulate the technical implementation of the programme, was a major factor for the success of OCP. SIZ management and ex-OCP countries should continue the tradition in applied and operational research. Some of the areas needing special attention are highlighted in this section.

5.5.2 The evolution over the years of CDTI efficiency, impact and determining factors (such as compliance, community mobilization and CDD’s dedication, CDD’s incentives, FLHS/CDD’s collaboration, integration factors at community level), in different epidemiological situations, are increasingly important areas of investigation.
5.5.3 Considering the paucity of resources, the period of time during which CDTI has to be applied is a matter of concern for national health services and NGDOs. Research has now to be intensified and expedited on the longevity and duration of fertile life of adult worms which have been submitted to repeated annual or bi-annual rounds of ivermectin over several years. Also, parasitological and epidemiological impact should be investigated in areas where ivermectin coverages were constantly below the required minimum level. Development of the DEC patch test should be concluded at the earliest.

5.5.4 An ongoing research activity is being carried out in Mali, Guinea Bissau and Senegal by TDR with national teams, APOC and MDSC collaboration, to explores the feasibility of eradication of onchocerciasis in the basins of Bakoye and Faleme in Mali and Senegal, using ivermectin treatment only. This is a model of research studies of major interest for the future of onchocerciasis control, to be implemented through joint North-South and multicountry initiatives, founded on national expertise in participating countries. Other research activities would encompass comparative studies on one or two annual distribution rounds of ivermectin, new impetus to operational studies on DEC patch test in replacement of the skin-snip, and pharmacological studies on local repellents (e.g. the Gobi oil in Guinea).

5.5.5 At high policy-making and administrative levels in the countries, the authorities and experts are concerned with the status of resistance of the parasite to ivermectin, and also with the advance of search for the development of alternative drugs, especially a macrofilaricide.

Recommendation 18

Countries and SIZ management should give a high priority to operational research. In this regard they should systematically identify research opportunities and take advantage of the national expertise available, and tap potential funding at national and international levels, to develop proposals and implement research activities.

6. The ex-OCP area: taking stock

6.1 The results achieved in SIZ

Epidemiological results

6.1.1 The epidemiological results in SIZ exhibit a very good overall picture. As far as the community-level parasitological load is concerned, the community microfilaria load everywhere has often been maintained far below the 0.5 maximum tolerable values. In no area of the Oti, Oumé, Mafou, Niger and Tinkasso river basins have the CMFLs increased. It should be emphasized that such a situation of the infection load in humans, which is also the case in four other non-SIZ countries, means that there is no more risk of onchocerciasis lesions and onchocerciasis visual impairment in those areas. This is a major achievement.

6.1.2 Despite this generally positive trend, in some localized sites, isolated autochthonous cases of incidences have been recorded, even in villages where prevalence was and is still well below the 5% threshold. Notwithstanding these results, it is unlikely that the prevalence in these villages can be brought down and kept at the tolerable level for a significant period during the SIZ remaining time-frame. It has also to be considered that villages which did not meet the standards in 2003 will only be reassessed in 2006.
Entomological results

6.1.3 In countries where the corresponding entomological parameters are measured (Togo, Benin), the entomological evaluation trends have shown peaks of biting densities and infection rates in 2003 and 2004.

CDTI

6.1.4 CDTI is maintaining high standards (higher than expected), and shows relatively few significant failures, given the large scale of operations.

Issues of concern

6.1.5 CDTI, nevertheless, raises some areas of concern due to:
- persistence of sources of infection for biting flies in the human populations
- local persistence of stagnant and even recrudescent figures of prevalence often affecting autochthonous persons
- uncertainty about the completeness of geographical coverage
- possible decrease of dedication to CDTI sustainability, both in communities and among health services staff, because of such factors as the decreasing impact of the disease and its memory in the communities, declining interest in onchocerciasis in the face of other priority diseases and control programmes, reduction in national budgetary contributions

6.2 Situation at the end of SIZ

6.2.1 By the end of SIZ, the five Participating countries concerned are likely to be faced with the following situation:
- need for continuation of reinforced CDTI, wherever required
- need for regular assessment of the epidemiological situation in the countries, and also reliable and cost-effective entomological surveillance (pool screening)
- CDTI would have been established in Sierra Leone only for a maximum period of three years, and drawing from APOC experience would require additional five years funding support to ensure sustainability
- vector control would have been stopped, and there will be a need for at least two subsequent years of classical entomological evaluation in the areas concerned, to assess the delayed effect of the strategy (as was done in the OCP).

6.3 Non-SIZ countries

6.3.1 In the non-SIZ ex-OCP countries where CDTI was well in hand and where entomo-epidemiological indicators had been satisfactory prior to OCP closure (four out of six countries), the epidemiological situation has been kept under control and recrudescence has not occurred. In these countries, because onchocerciasis had been in the past a severe health and socio-economic problem, the authorities, health services and especially the communities are still very supportive of CDTI. In such countries, CDTI is continuing satisfactorily, but activities have been interrupted in Côte d'Ivoire and Guinea Bissau.

6.3.2 Epidemiological surveillance for the detection of any recrudescence is continuing in the non-SIZ area. Skin snip methodology is still employed, due to the non-conclusion of the
development of the DEC patch test. Entomological surveillance utilising the pool-screening of a mass of flies for infective parasites, using the molecular biology technique is also continuing despite operational difficulties as well as insufficient and irregular feed-back. Although most of the countries have integrated onchocerciasis surveillance in their national disease surveillance systems, the indication is that they need some support to sustain it.

6.4 The wider perspective: SIZ and non-SIZ countries

6.4.1 The countries have stated or in some cases have demonstrated that continuing inter-country collaboration would be advantageous. This is already the case through informal cross-border meetings, which have even taken place or are planned with APOC neighbouring countries. Continuation and expansion of this collaboration could encompass:
- coordinated analysis of onchocerciasis evaluation, surveillance and treatment results, with identification of trends and planning of appropriate interventions
- advocacy for onchocerciasis control and mobilisation of additional resources to bridge the gap between what is needed and what the countries can provide
- exchange of information and collaboration in control activities by countries, all of which are now using the same strategy of CDTI
- support to Côte d’Ivoire and Guinea Bissau, for reactivation of onchocerciasis control when the situation permits.

6.4.2 Such support and inter-country collaboration will best be facilitated by an organisation within the region with expertise in the common strategy of CDTI, and with practice in sharing experiences across borders. APOC has the operational capability to meet this objective and will be best suited to harmonise activities of all the ex-OCP countries with that of its own programme.

Recommendation 19

A mechanism should be found to strengthen support to efforts deployed by the ex-OCP countries to maintain OCP achievements. In this respect, APOC appears to offer the most adequate platform for technical advice, and for organizing an active forum for cross-examination of issues of mutual concern.

6.4.3 It must be considered that from now on, except for vector control in Benin and Togo, the CDTI-related activities are similar in SIZ and non-SIZ areas, and that, all over, there are still risks of recrudescence and persisting pockets of low-level transmission. SIZ areas receive SIZ financial support. However, both SIZ and non-SIZ ex-OCP countries are in need of external support to complement MoH’s budget, which is generally insufficient to ensure effective CDTI, as well as standardized epidemiological evaluation, epidemiological surveillance and appropriate intervention. The impending cessation of SIZ activities is an additional reason to work out a mechanism of support to ex-OCP countries, all of which have to prolong CDTI activities, recognising that no premature interruption of the control programme should be made without an assessment of the conditions required for safe cessation of CDTI. It would be unfortunate if CDTI is stopped prematurely, particularly if only a few years are needed to lower the risk of recrudescence to an insignificant level.

Recommendation 20

As early as 2006, SIZ Management must invite all NOCP’s to prepare national plans of action, with costing, for post-SIZ onchocerciasis control activities at the country level taking into account the integration of CDTI within the national health services. More specifically, the plan should examine funding contributions from all partners, in order to assess the extent of programme dependence on external resources, and to forecast needs and identify funding sources
for the future. At a further stage, SIZ management should assist the NOCP's in the finalization of those national plans.

D. Conclusions

a) In the SIZ and non-SIZ countries of the ex-OCP area enjoying peace, and where OCP had provided external funding and expertise, onchocerciasis control has remained a health priority, and there is political will for continuing CDTI. The NOCPs and their experienced coordinating teams are able almost everywhere to maintain the momentum with much dedication. At all levels of health services, the time and technical support invested in various aspects of CDTI have been very significant. Integration has been established or shows rather good prospects, both at the national and peripheral levels, including at the CDDs level in affected communities. Use of ivermectin has been widely accepted and its distribution is now part of the community's annual agenda. As part of community involvement, and despite growing requests for incentives, CDDs' dedication is strong, and the paucity of incentives is not adversely affecting coverage. An interesting observation is that the SIZ high standards for therapeutic coverage (85 % of the total population) have been extended to and achieved by the non-SIZ areas.

b) Can these results be maintained? There are few treated areas where, by 2008, it will be possible to guarantee a zero risk of recrudescence in the short term. The probability of persistence of infection in humans and/or pockets of transmission both in SIZ and non-SIZ areas has to be reckoned with. Consequently, there is an imperative need for continuation of CDTI in SIZ and non-SIZ areas, and of adequate monitoring and surveillance for an undetermined number of years after cessation of SIZ activities at the end of 2007. For the SIZ area particularly, the review team concludes that the need is for continuation of reinforced CDTI after 2007, according to the initial plan which, from modeling studies, indicated 2012 as the end point for zero risk of recrudescence (Sierra Leone was not included in the prediction). Even though the risk of recrudescence is significantly reduced at the moment, its overall elimination cannot be asserted over the next two years, since the evolutionary period of the disease is such, that differences in indicators will not be observable before the end of 2007.

c) This need for continuation of CDTI is even stronger in Sierra Leone and Ghana. In Sierra Leone, a World Bank-supported project with a three year life-span has commenced. Technical input will be required from the SIZ management for this project over the coming two years. In Ghana, improvement in CDTI coverage rates have been achieved only in the last two years and the epidemiological parameters are not so good. For Côte d'Ivoire, hardly any information is available from the areas which were more severely affected by the disease; no effective CDTI has been possible in this part of the country over at least two years, and an overall re-evaluation of the situation should be completed as soon as the conditions permit.

d) Up to now, and notwithstanding incomplete analysis of entomological data, vector control does not seem to have had all the expected impact on vector biting populations and transmission in the upper Oueme river basin in Benin. On the upper Oti river basin in Togo (rivers Keran, Kara and Mo), in spite of recent improvements until 2004, entomological results (biting densities and intensity of transmission) did not show clear improvement over the OCP period 1997-2002. This is most likely due to the fact that this basin is not isolated from migrant flies, which are consecutive to the cessation of OCP vector control operations, and to the persistence of human reservoirs of parasites despite CDTI coverage. Probably for similar reasons, the Upper Oueme basin shows an increase in figures from 2000 to 2005, although the current epidemiological situation is very satisfactory.
e) As to the continuation/cessation of larviciding, decisions taken by SIZ would be:

- Continuation in Oti as an "umbrella" provided that all means are mobilized at the same time for optimisation of CDTI results
- Experiments on Oueme as a reinvaded area and a source of Oti reinvasion.

Any savings on flight hours, spared as a result of these measures, could be used for assistance to national teams for improvement of CDTI coverages.

f) More generally, wherever possible, any savings in the SIZ programme should be reallocated to support national teams in the SIZ countries which have to cope with far lower budgets in the non-SIZ areas. Such additional funds, if they became available, should be geared towards CDTI coverage and epidemiological evaluation. Indeed, there is a strong discrepancy between the efforts made by national CDTI teams in three visited countries with both SIZ and non-SIZ areas, with restricted CDTI budgets, and that of vector control which accounts for some 60% in the overall SIZ budget (this implies no criticism of the aerial operations and insecticide application in themselves, which have been conducted with utmost technical expertise, as they were during the OCP period). It must be emphasized that, if national teams are not provided with the minimum resources to ensure at least feasibility of CDTI improvement while SIZ resources are still available, it might appear retrospectively that keeping the expensive vector control umbrella for two more years would have been of little effect.
Annex 1/Annexe 1
Map showing former OCP area and SIZ/Carte de l'ex-OCP indiquant les Zones d'interventions spéciales

ONCHOCERCIASIS CONTROL PROGRAMME IN WEST AFRICA
PROGRAMME DE LUTTE CONTRE L'ONCHOERCOSSE EN AFRIQUE DE L'OUEST
Terms of Reference
for the Mid-Term Review of the activities of the Special Intervention Zones (SIZ)
AND
for the Review of the effectiveness of the Onchocerciasis Surveillance Systems of the ex-OCP Countries

1. Introduction and background

1.1 With the cessation of OCP operations in December 2002 the Programme had met its objective i.e. to eliminate onchocerciasis as a disease of public health importance and as an obstacle to socioeconomic development throughout practically all of the Programme area.

1.2 However, in four limited and defined areas the entomo-epidemiological situation remained unsatisfactory after several years of combined vector control and ivermectin treatment. These areas therefore qualified for “Special Intervention” and were referred to as “Special Intervention Zones (SIZs)”. They included the basin of the Pru (Volta Lake) in Ghana, the basin of the Oti and its tributaries (Volta Lake) in Togo, the adjacent Upper Oueme river basin in Benin, and the basins of Mafou and Tinkisso (Upper Niger) in Guinea. In addition to these limited areas, the whole of Sierra Leone where onchocerciasis control activities were suspended after a maximum of five consecutive years of combined larviciding and ivermectin distribution was included as a fifth SIZ.

1.3 It was therefore decided by the last Joint Programme Committee in December 2002 that for all five zones ivermectin distribution should be reinforced to achieve 100% geographical and at least 85% therapeutic coverage (65% in Sierra Leone), ivermectin treatment to be given annually in the Pru basin and Sierra Leone and semi-annually in the remaining three basins, all up to 2012, while aerial larviciding would be continued during five years after December 2002 in the Upper Oti and the Upper Oueme river basins.

1.4 The principal method of control in the SIZs is ivermectin treatment under community direction [Community-directed Treatment with Ivermectin (CDTI)]. Aerial larviciding, combined with CDTI is applied in the Upper Oti and Oueme river basins. Furthermore, an important element is capacity building and mobilization and sensitization.

1.5 The cost of operations in the five SIZs has been estimated as US $ 12,098,732 covering activities until the end of the project in 2007.

1.6 The general objective of operations in the five SIZs is to bring the entomo-epidemiological parameters to levels which correspond to the OCP standards and which can easily be maintained by the Participating Countries.

2. General objective of the review

2.1 To assess the progress towards meeting the specific objectives of the operations in the five Special Intervention Zones; and to make recommendations for improvement of the strategies applied, the structure and the operations, as well as for follow-up action post-2007.
2.2 To assess the effectiveness of the onchocerciasis surveillance systems in the ex-OCP countries

3. **Specific objectives of the review**

3.1 To review and assess the SIZ management arrangements at all levels (headquarters, Kara, and country levels), taking into account the support received from APOC.

3.2 To review and evaluate the processes and performance of CDTI, Vector control and surveillance in the SIZ to inform on prospects of whether operations will succeed in reaching objectives.

3.3 To review and evaluate the performance of the onchocerciasis surveillance in the ex-OCP countries since December 2002 to inform on prospects of whether the surveillance systems in these ex-OCP countries are effective enough to maintain OCP achievement.

3.4 To assess prospects of sustainability of onchocerciasis control beyond 2007, taking into account integration, partnerships and external support.

3.5 To assess the need for ongoing support within the ex-OCP countries but outside the SIZs.

3.6 To assess the adequacy of the support given by the Special Intervention Team to countries outside the Special Intervention Zones.

4. **Terms of reference**

4.1 **Programme Management**

4.1.1 To review and assess the Management arrangements at the headquarters of SIZs operations in Ouagadougou, in Kara and at country level, taking into account the support received from APOC.

4.1.2 To examine the financial management at the headquarters of operations in the SIZs vis-à-vis the APOC structure and programmes in the field.

4.2 **Programme implementation, financing and its impact**

4.2.1 To review and evaluate the performance of operations in the five SIZs and assess the prospect that operations in the SIZs will succeed in reaching their objective; and propose, when required, improvements in the various components of the operations.

4.2.2 To review the process of CDTI implementation and in particular evaluate the overall geographical and therapeutic coverages attained so far and make recommendations to ensure CDTI achieves coverage at, or above, the required levels.

4.2.3 To review and evaluate the progress, performance and impact of the vector control activity, and the likelihood that vector control will achieve the local elimination of onchocerciasis transmission and the reservoir of the parasite.

4.2.4 In view of the limited funds available for the SIZ areas, to consider different strategic options that will allow optimal utilization of the remaining funds towards sustained elimination of onchocerciasis as a public health problem.
4.2.5 To propose such activities that will facilitate sustainability of ivermectin treatment for the required period and beyond.

4.2.6 To review and assess the role and input of the different partners (WHO country offices, MDSC, NGDO) in the conduct of the activities in the SIZs and the other ex-OCP countries.

4.2.7 To assess whether the Special Intervention Team has given required support to countries outside the SIZs.

5. **Organizational aspects**

5.1 Based on past experience with the ex-OCP, the Special Advisory Committee (SAC) of the SIZ composed of experts with skills in ophthalmology, entomology, public health/epidemiology, social science and ecology/environmental protection has agreed, as a group of experts, to undertake the review and to co-opt one expert with experience in the administration and finance, to join the group.

5.2 The review will be completed and presented to the Executing Agency of the SIZ (WHO) and the Fiscal Agent (The World Bank) in the context of the APOC CSA by the end of October 2005.

5.3 The Headquarters of the operations in the SIZ and the Management of APOC will provide support for the review exercise.
SIT organization chart

APOP
Office Programme Director,
Team Leader/SIZ
Ouagadougou

Deputy Team Leader (DTL)
Ouaga

Data Management Assistant (DMA)
Ouaga

Secretary
Ouaga

Chief, Vector Control Team
(CVCT)
Kara

Chief, Drug Distribution and Training
(CDDT)
Kara

Transport, Logistics & Maintenance Officer (TLMO)
Ouaga

Chief Mechanics
Kara

Assistant Chief Mechanics
Kara

4 Drivers/Vector Collectors

Assistant Chief Mechanics
Kara

3 Drivers/Vector Collectors

Chief National Base
Kara

Chief National Base
Parakou

Secretary Radio Operator
Kara

Secretary Radio Operator
Parakou

Lab. Tech.
Parakou

Lab. Tech.
Kara

Lab. Tech.
Parakou

Lab. Tech.
Kara

3 guards
Kara

Ento. Technician
Parakou

Ento. Technician
Kara

2 guards
Parakou

Legend:
Working under contracts with the Special Intervention Zones
Working under Letter of Agreement with the Governments
Annex 4

Vector Control: chart on biting densities and intensity of transmission

ANNUAL BITING RATE IN OTI AND UPPER OUHEME BASIN

CRUDE ANNUAL TRANSMISSION POTENTIALS IN OTI AND UPPER OUHEME BASIN