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# Executive Summary

The project is designed to tackle existing gaps in knowledge of pesticide use in Ethiopia's Rift Valley and its impact on human health, agricultural yield and biodiversity. There is limited capacity and incentive for pesticide use monitoring within government outside of the food production sector (and even that is primarily focused on high value exports such as coffee). Therefore this project also seeks to raise awareness and understanding of the impacts pesticides can have on biodiversity, human health and, in the case of cotton, its effect on stunting agricultural yields.

There is evidence that the project is making an impact on the lives of smallholder farmers in southern Ethiopia to reduce pesticide use and yet increase their yields through growing cotton organically and applying integrated pest management practices. This is a good example of a project that is able to easily balance the dual objectives of the Darwin Initiative – supporting both biodiversity conservation and poverty alleviation.

Where this project struggles is being able to demonstrate its progress and impact in a concise way and coherent way.

The project has a weak logical framework and a workplan that is very focused on inputs and activities and fails to identify useful indicators that are SMART. This has made it very hard to evaluate since often the team are unsure what the expected milestones should be at this stage, or what could be considered evidence of the outcome of their work. This has meant the evaluation has had to be very iterative.

It is clear the Ethiopian Lead is a dynamic and determined man who has had considerable success in the past in raising the awareness of pesticide use and its harm in Ethiopia. One of these successes has been in establishing PAN Ethiopia, a relatively new NGO and probably the only one in Ethiopia to specifically target pesticide use. This is a fledgling organisation though with a largely new team (many have joined in the last 12 months). With the lack of a comprehensive monitoring plan, often it is the Ethiopian Lead who is the only one able to answer questions on the expected impacts of this project.

The work in Arba Minch is showing some evidence that the work of the project will contribute to both biodiversity and poverty gains from reducing pesticide use in cotton farming. This element of the project should provide multiple poverty benefits for the 2000 target farmers (both male and female) and their families including better health (through reduced exposure to harmful pesticides), better yields (up to 100% increase) and generate better value for their products through the cooperatives – both on the domestic market and the international market (through organic certification companies like H&M and C&A are interested in buying this cotton). Through this project the number of beneficiaries are reasonable given it is a test-case (2000 farmers) but there is intention to scale this up post-Darwin and there is already evidence of cascade training beyond the scope of this project's boundaries.

In addition, whilst a small number of target beneficiaries, the project should result in greater household income and reduced vulnerability for women recruited as members to the women's spinning cooperative. This cooperative is expected to generate greater value for cotton products for those involved. It also provides members with access to micro-credit facilities since the 3 cooperatives are registered as Micro-Finance Association. Under this project the number of beneficiaries are small (60 women) but there is intention to expand this post Darwin if successful. This seems reasonable for a pilot approach.

In Ziway, the project has made considerably less progress and appears to be ignoring opportunities to learn from others efforts, in both Ethiopia and East Africa to influence practice in pesticide use. I'm also unclear as to whether the schools awareness raising work will have the hoped for impact on farming practice in the region.

There are 4 main recommendations to this project to improve its chances of achieving the original outcome statement.

**Recommendation 1:** Revise the logical framework paying particular attention to the outcome level indicators which currently are not SMART ensuring the project is capable of capturing both the poverty and biodiversity benefits expected to be achieved by the project. A proposed draft logframe was developed with the team which requires more work from the team but is a substantial improvement.

**Recommendation 2:** Develop a coherent communications strategy to ensure the results of this ecotoxicological monitoring can support the government and private sector to change practice that is beneficial to environment, human health taking account of economic growth targets. This should include a review of the relevant actors that could support this work and a review of the types of products that could support this work including policy briefing notes.

**Recommendation 3:** Consider lifting the sights of this work to not only influence Ethiopian government policy but to present the results of this work to Ethiopian donors such as DFID. Consideration will need to be taken of how to present this work to an acceptable international standard to make greatest impact.

**Recommendation 4:** Seek to understand the lessons emerging from other groups on how to influence changes in practice in flower farms in Ethiopia and elsewhere in East Africa. Expand the point of reference to include issues outside of just pesticide use e.g. water use, Fair Trade etc.

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<b>Project Ref No.</b>	20-018
<b>Project Title</b>	Pesticide Impacts on Biodiversity in Ethiopia & Agroecological Solutions
<b>Country/ies</b>	Ethiopia
<b>Lead Institution</b>	PAN UK
<b>Partner Institution(s)</b>	PAN Ethiopia; Addis Ababa University; Institute for Sustainable Development, Ethiopian Wildlife and Natural History Society, Ethiopian Institute of Biodiversity,
<b>Darwin Grant Value</b>	£299,565
<b>Start / End Date:</b>	Apr 2013 – Mar 2016
<b>Funder</b>	DFID

# 1. Introduction

## 1.1. Project Summary

Funded in 2013, this project is designed to address overuse of pesticides in agricultural practice in (some of which are banned) that are having a detrimental impact on both biodiversity, human health and agricultural productivity.

Ethiopia's Rift Valley is an important route for migratory birds, particularly wetland species but many of these birds are declining in number. There is some evidence<sup>1</sup> to suggest that at least part of this decline may be linked to increasing reliance (without proper safeguards) on agrochemicals in cotton, flower and vegetable production in Ethiopia. In addition, from previous work conducted by donors including FAO, there is evidence that the pesticides being used include those known to have significant implications for human health including endosulfan, an organochloride insecticide which is acutely neurotoxic to humans and was banned under the Stockholm Convention in 2012 (which Ethiopia is a signatory to).

The project has a series of aims: to build capacity in Ethiopia to monitor ecotoxicology, to assess the impact of pesticides on ecosystems (of which there has been little attention to date), to increase awareness of the impacts of pesticide use and the benefits of agro-ecological methods, to boost productivity, health and environmental condition of 2 sites through the promotion of agro-ecological methods, and boost market potential for agricultural production of cotton through cooperatives and organic certification.

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<sup>1</sup> Yohannes, Y. B., Ikenaka, Y., Shouta, N., Ishizuka, M. (2014) Organochlorine **pesticides** in **bird** species and their prey (fish) from the Ethiopian Rift Valley region, **Ethiopia**. *Environmental Pollution* 192: 121-128

There is a substantive match-funded project intertwined in this project funded by TRAIID. This project is trialling something called 'food spray'. Food spray is the brainchild of Dr Robert Mensah, who trialled its use in Benin as natural alternative to pesticide use. It is primarily composed of maize, sugar and soap and works by attracting pest-eating insects. The Ethiopian farmers call these 'farmers friends'. The Darwin's project role is to collect monitoring data on the results of this field testing in 90 cotton farms (smallholder and commercial) and, if successful, promote the rolling out of this low-tech pesticide management to other farms.

## 1.2. Scope of the review

This Mid Term Review (MTR) was commissioned to provide an external perspective on project progress and future direction for the benefit of the project partners, and the Darwin Initiative. It is a formative review that is designed to:

- i. Ensure that the project activities are being delivered efficiently and effectively, and
- ii. Improve the project's design as it is rolled out

The project was assessed against the original proposal and logical framework combined with a 6 day host-country field visit in November 2014 to the 2 project field sites in Arba Minch and Ziway.

Methods employed in this MTR included:

- Document review of project documents submitted to Darwin Initiative
- Document review of materials collected on field work
- Field based interviews with project staff, stakeholders and beneficiaries
- Telephone interviews/follow ups with project staff and stakeholders

The Review followed the OECD DAC Criteria for evaluating development assistance (relevance, effectiveness, efficiency, impact, sustainability).

The scope of the review is split into firstly a review of the Project against the Project Objectives and secondly against Programme Objectives.

## 1.3. Methodology

The review followed the OECD DAC criteria for evaluating development assistance (relevance, effectiveness, efficiency, impact and sustainability).

The standard approach to conducting a field evaluation for a Darwin project is to refer to evidence listed in the logical framework and attempt to triangulate this evidence through interviews, focus groups and visual observation.

The original logframe for this project was of some use for describing what their overall objectives were but had no SMART indicators. Therefore the review took an iterative approach

to determine how these objectives could be measured and evidenced. This involved interviews with the project team, project partners, beneficiaries of the project along with visual observation and reference to material evidences listed in the project logframe. The material evidence submitted was largely evidence of activity with no material evidence available to show the projects progress towards the project outcome. Therefore at the outcome level there was little opportunity for triangulation – instead the reviewer relied upon expert witness statements for the most part to ascertain progress.

The final day of the review undertook a revision of the project’s theory of change and logframe in a participatory workshop with the project team. This was to help guide reorientation of the project’s efforts to monitor and evaluate their own progress and support them in better reporting this to the Darwin Initiative and their stakeholders.

## 2. Review against Project Objectives

### 2.1. Partnerships:

Pesticide Action Network (PAN) Ethiopia is a relatively new NGO (established 2008), that was established as a stand-alone NGO from PAN UK. **However they have a strong, mature relationship due to PAN Ethiopia’s origins and ongoing work together.**

The relationship with the other partners appears strong and largely based on individual connections which are forming into formal, working relationships. For example, the lead at the Ministry of Agriculture’s lab (Dr Tarekegn Berhanu) was the supervisor for PAN Ethiopia’s Director’s MSc and will act as co-supervisor of the MSc student employed by ISD to undertake the monitoring work at Ziway.

During the first few months of this project there was a visit by 4 of the Ethiopian partners to the UK for training. This also served as a useful inception meeting to ensure all the partners understood the project, their roles and responsibilities and the workplan.

### 2.2. Relevance:

**The project seems well designed to fit national priorities.**

Ethiopia’s NBSAP<sup>2</sup> published in 2005 makes only a small reference to pesticide use being a cause of biodiversity loss in agricultural systems. But it considers over-intensification of agriculture and the low value of environmental services as critical reasons why biodiversity is at

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<sup>2</sup> Government of the Federal Democratic Republic of Ethiopia (2005) National Biodiversity Strategy and Action Plan. <https://www.cbd.int/doc/world/et/et-nbsap-01-en.pdf>

risk in Ethiopia. The Fifth National report<sup>3</sup> submitted in 2014 similarly makes no reference to pesticides but makes multiple references to the damage pests are causing to biodiversity.

Ethiopia's Growth and Transformation Plan<sup>4</sup> 2010-2014 (its poverty reduction strategy paper), makes no reference to pesticide use. However agricultural expansion is expected to play a significant role in boosting Ethiopia's economy with particular reference made to '*transform subsistence agriculture to more market led production*' through '*improvements in farmers' productivity and production*'.

Pesticide use by both smallholder and commercial farms is widespread in southern Ethiopia. Prior to this project there had been a small number of studies of pesticide use suggesting that it was having a detrimental effect on biodiversity and human health but there was no systematic collection of evidence of what pesticides were being used and in what volumes. There was also no systematic monitoring of the impacts of this pesticide use on human health and biodiversity. Therefore current agriculture, health and biodiversity policy has not taken into consideration pesticide use. This project has been successful in identifying a real gap in knowledge and what policies this work would be useful for.

For the purpose of this review it will be useful to start considering this project as separate elements with a similar objective:

- Testing of alternative pest control (food spray and integrated pest management) on yields, biodiversity and human health in cotton and (soon) vegetable production
- Monitoring of pesticide impacts through ecotoxicology monitoring including residue analysis and biodiversity monitoring and present the evidence to Government to influence policy on pesticide use
- Providing cascade training on the impacts of pesticides on biodiversity – incorporated into the curriculum of Farmer Field Schools funded by TRAIID to educate farmers on pesticide impacts on health and yields
- Establishment of cooperatives to improve market value of goods – Farmers cooperatives to achieve organic cotton certification and Women's spinning cooperatives to cut out the middle men and take cotton products directly to market
- Schools education programme as an indirect method of attempting to educate parents in the use of pesticides

The first 4 elements have strong logic and by and large have identified suitable partners and audiences for this work. In Arba Minch, the primary site, the work is building on previous efforts by donors including FAO<sup>5</sup>. There is genuine enthusiasm for the techniques being trialled by both small holder famers, commercial farmers and the local Government agencies including the

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<sup>3</sup> Government of the Federal Democratic Republic of Ethiopia (2014) Ethiopia's Fifth National Report to the Convention on Biological Diversity <http://www.cbd.int/doc/world/et/et-nr-05-en.pdf>

<sup>4</sup> The Federal Democratic Republic of Ethiopia: Poverty Reduction Strategy Paper: Growth and Transformation Plan 2010/11-2014/15 – Volume I <http://www.imf.org/external/pubs/ft/scr/2011/cr11304.pdf>

<sup>5</sup> FAO Prevention and Disposal of Obsolete Pesticides, Africa Stockpiles Programme <http://www.fao.org/agriculture/crops/obsolete-pesticides/africa-program/en/>

Plant Health Clinic, Ministry of Agriculture and Ministry of Health. It is clear this project has pitched the project well for this area.

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*'Before this Darwin project we had no experience in pesticides and what they do. Now we have received great training and knowledge. We now have the responsibility to scale this project up and can easily extend this into other areas'*

Mr Chengerie Tsala, Head of Arba Minch Agriculture Office

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**The smallholder farmers are a vulnerable group facing significant hardship. This project is designed to provide multiple poverty benefits for these groups** including better health (through reduced exposure to harmful pesticides), better yields and generate better value for their products through the cooperatives – both on the domestic market and the international market (through organic certification). Through this project the number of beneficiaries are reasonable given it is a test-case (2000 farmers) but there is intention to scale this up post-Darwin.

Gender has clearly been considered in the Arba Minch site in that the farmers groups include both men and women, and the spinning cooperative targets specifically women. The establishment of the spinning cooperatives is expected to generate greater value for cotton products for those involved, and also provide members with access to micro-credit facilities since the 3 groups are registered as Micro-Finance Associations. Under this project the number of beneficiaries are small (60 women) but there is intention to expand this post-Darwin if successful.

The 4<sup>th</sup> element (schools education programme) is weak in logic and it is unclear why the team chose this route when they have proven success using the Plant Health Clinic and Agricultural extension agents to promote alternative pest control methods in Arba Minch.

**Recommendation:** Revise the logic regarding how best to influence agricultural practice in Ziway. Consider scaling back activities on the school work to target farming practice through more cost-effective channels.

### 2.3. Efficiency:

**The project is running efficiently in that there is a detailed project plan, all staff have a clear job description and there are regular meetings between the partners to discuss progress.** The team referenced many occasions when an adaptive management approach was used and where they have strived to achieve good value for money. The Ethiopian partner, PAN Ethiopia, is clearly a strong partner and conducts much of the work in-country.

**Where efficiencies are being lost is due to the weak logical framework and its associated indicators.**

It is clear from looking at the logframe submitted in the Stage 2 application that an opportunity to strengthen this project was missed by the Darwin Initiative. There are few SMART indicators and the outcome indicators are almost entirely unmeasurable.

The team have attempted to revise their logframe on 2 occasions – after the New Projects Workshop in May 2013 and after their feedback from the Annual Report review. Both attempts have missed the mark in that they developed an overly complex M&E plan that was heavily focused on counting inputs and activities with little or no opportunity for the team to evaluate the outcome of all this activity or to regularly review the risks and assumptions to this work. It is particularly disappointing that the team had employed an M&E consultant to support them but still failed to develop a useful logical framework. **There appears to be a significant gap in knowledge and understanding of M&E within the project partners.**

This has made evaluating the project particularly difficult. The indicators were of little use therefore much time had to be spent with the team trying to understand what is being done, what evidence could be used to demonstrate progress and results, and whether the work was funded by Darwin or the TRAIID project. **Despite this, there is clearly lots of data being collected by the project which could be put to good use in evaluating the success of its work.**

Despite this, much of the project appears to be efficiently managed. There is a clear balance between the poverty and biodiversity elements of the project. On occasion the team have missed opportunities to highlight the poverty benefits of this project but given this is probably the first occasion where biodiversity has been an explicit objective of the PAN Ethiopia team it is understandable that they have overly emphasised the biodiversity aspect.

From the budget set up it is hard to understand where the greatest effort is being placed since it doesn't differentiate by site or output. From talking to the project staff the emphasis is on the work in Arba Minch. Certainly the work in Arba Minch appears to be good value for money and well managed given the number of beneficiaries and the impact felt (see section 5.4 and 5.5). There is little evidence of the value of the work in Ziway since the logic of its approach is less clear and it is at such an early stage. From talking with the various partners, this was a smaller focus of the project anyway. The monitoring data and the capacity that will be built to undertake this monitoring is of value if it can be completed within the timeframe of the project. It is the schools awareness raising programme that is of questionable value.

**Recommendation:** Revise the logical framework paying particular attention to the outcome level indicators which currently are not SMART.

**Recommendation:** Ensure when discussing the benefits of this project that you comment on both biodiversity and poverty gains expected as a result.

## 2.4. Effectiveness:

The project outcome statement is overly long and complex. It is:

*'Improved capacity of Ethiopian scientists, farming communities, government agencies and other stakeholders to adopt an ecosystem approach to (a) identify key sites at risk from the harmful environmental effects of agrochemical use (b) monitor, measure and understand such impacts close to biodiversity-rich wetlands, (c) develop and implement practical solutions based on agroecological farming and (d) align policies with biodiversity conservation goals.*

*Rift Valley Lake farming communities will benefit from safer, sustainable pest management, better water quality and ecosystem services. Government agencies and conservation bodies will gain skills to monitor pesticide impacts with rural communities and feed evidence into policy forums'*

For brevity of use the 2<sup>nd</sup> paragraph is probably the most useful.

As mentioned above, the indicators proposed in the stage 2 application are weak with few of them SMART making evaluating their progress difficult. In addition, there is the challenge of the intertwined match-funded TRAIID project which is particularly confusing in output 3.

*Output 1: National capacity built in ecotoxicological monitoring with a focus on pesticide use in the Ethiopian Rift Valley, enabling assessment of pesticide contamination and impact on wildlife and food chains of which migratory changes in status to be evaluated later.*

**Good progress is being made at Arba Minch with the monitoring data being fed into decision making at a local level – through the Ministry of Agriculture and the Plant Health Clinic.** There is clear demand for this data and some commitment (verbal) to include this in the local government activities post-Darwin.

There is evidence from field monitoring that pesticide use is reducing by farmers targeted by the project. In addition, there is clear evidence that yields for these farmers are increasing when they apply the integrated pest management principles taught by the project. Yields are also further increasing for those farmers that apply the experimental food spray (funded by TRAIID with the monitoring funded by Darwin) with the average yield increase of 100%. Further to this the project has been able to demonstrate that commercial farmers using pesticides are seeing a 3,199 Birr/hectare profit vs. smallholder farmers who are applying IPM methods and food spray are seeing a 6,000 Birr/hectare profit.

The resultant effect of reduced pesticide use on health is being monitored anecdotally using surveys. This is because there is no systematic data collection by hospitals and medical clinics of incidences of poisoning in Arba Minch. In addition medics in Arba Minch have limited experience in diagnosing and treating pesticide poisoning. Therefore the project has developed surveys that can measure variation in cases of acute pesticide poisoning. This method will not allow the team to collect data on chronic poisoning. For this, pesticide use is being used as a proxy for long-term human health benefits.

**At Ziway progress is far slower compared to Arba Minch. There is a project workplan but it doesn't define tasks at the site level and the project team seemed unaware of what the expected timeline of the work was expected to be in Ziway.**

A desk-assessment has been undertaken that collates all existing data. New, field collection of data is not expected until the New Year and the residue analysis is likely to take 6-9 months after that to complete. The audience has been identified for this work but there is no strategic

plan of how to utilise this new data to best effect. The expectation is that this report will be hard hitting and will be useful to campaign for changes in pesticide use in the flower farms at Ziway. This may be an overly combative approach and a more conciliatory approach to working with the flower farms and Ministry of Agriculture may have greater effect in influencing practice.

**Recommendation:** Given the Ziway report is not expected to be ready until the final months of the project consider ways in which to smooth the way of this report to ensure a more receptive policy environment.

*Output 2: Baseline understanding compiled of current biodiversity, pesticide use patterns and effects of key species in aquatic ecosystems to enable changes in status to be evaluated later.*

This output heavily overlaps with output 1. In fact, this output could be seen to be an indicator of the capacity built in output 1.

*Output 3: Increased uptake of agro-ecological farming methods by trained farmers in cotton-growing project sites (smallholder + plantations).*

**The Darwin project has shown that pesticide use is stunting yields (zero use control sites had higher yields than pesticide treated sites), is an unnecessary extra expense for farmers and has a causal link with health impacts in farmer communities.**

This impact cannot be entirely attributed to the Darwin project, however. The training provided in integrated pest management and food spray is being funded partly by TRAIID (2000 farmers through cascade training). The Darwin Initiative's contribution to this training is the education about biodiversity to farmers. Aside from the training element it is the monitoring of the results of these applied techniques that is funded by Darwin. The results of these new techniques on yields produced by the Darwin project is being fed back to both the farmers but also various local government bodies to secure support for this programme and its expansion. Therefore expansion of these methods to other farms could be considered a useful indicator of the impact of the Darwin project. Such is the strength of the Darwin data that there is strong commitment from the local government agencies in Arba Minch to expand these methods but this time using their own agricultural extension agents as a route to its expansion.

**Recommendation:** Attribution of the success of the IPM and food spray techniques to increase yields should be attributed in part to Darwin funding and in part to TRAIID funding. Reporting on this project should take care to make this clear.

**Recommendation:** Develop SMART indicators that can measure both the biodiversity and poverty benefits expected as a result of the Arba Minch work.

*Output 4: Enhanced awareness by rural communities, government agencies and other stakeholders of the adverse effects of pesticide use on Rift Valley aquatic ecosystems and farming livelihoods and of the measures needed to address these.*

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*'Before this project we were told that pesticides were medicine by our fathers. Now we have the information that pesticides are harmful not just to humans but to air, birds and the environment. Now we know what we are doing and are growing cotton without pesticides. '*

Mr Menxa Maile, Cotton smallholder farmer, Arba Minch

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**There has been considerable progress in this issue in Arba Minch.** In Ziway, the team are starting at a much earlier stage and are also using a different route to inform practice. In Arba Minch the team have used Farmer Field Schools established under previous donor work to educate farmers and local government agencies in the harms of pesticides. In Ziway they have bypassed this successful model and have attempted to inform farming practice through school environment clubs. Progress to date has been slow with 12 students and teachers having received training with an expectation that this will cascade to a total of 60. There is some anecdotal evidence that some of the parents are being educated by their children on pesticide use but a systematic survey of the efficacy of this route has not been undertaken. The reviewer has reservations that this method will have any significant impact on practice in this area.

**Recommendation:** As before, revise the logic regarding how best to influence agricultural practice in Ziway. Consider scaling back activities on the school work to target farming practice through more cost-effective channels.

*Output 5: National Biodiversity & Agricultural Stakeholder Group established to provide supportive policy environment for sound agricultural practices that conserve biodiversity.*

This output has been postponed until year 3. The team are determined that first they need to have the results of their monitoring at both Arba Minch **and** Ziway before such a group can be convened. However given the monitoring report on Ziway is unlikely to be available until the last 4 months of the project it is unlikely that this group, if convened, will make any real impact on the policy environment by the close of the Darwin project.

There is an apparent lack of considered strategy of how to ensure the materials produced by this project meet a receptive policy environment in Ethiopia. There is little evidence of previous examples where the Government and Private Sector have been receptive to critical reports of action with regards to pesticide use. The team are placing too much reliance that good robust data will lead to policy change.

Both the PAN UK and the PAN Ethiopia Directors seem to have great connections and identified channels through which they want to influence change, however there is either a lack of strategy or they are struggling to coherently explain their strategy to both their wider team and the Darwin evaluator.

**Recommendation:** Develop a coherent communications strategy to ensure the results of this ecotoxicological monitoring can *support* the government and private sector to change practice that is beneficial to environment, human health and doesn't stunt economic growth

unreasonably. This should include a review of the relevant actors that could support this work and a review of the types of products that could support this work including policy briefing notes.

*Output 6: Project training methods, monitoring results and lessons emerging are made available to relevant stakeholders elsewhere in Ethiopia and beyond.*

**Similar to output 5 the Ethiopian team's communications strategy largely consists of writing technical reports that are made available to audiences.** There is a plan to write at least 1 peer review paper on this work but this is unlikely to be ready before the end of the project.

It seems the UK team are taking a different approach when trying to make these results and lessons available to relevant stakeholders. They are specifically targeting international groups with links to large numbers of smallholder cotton farmers e.g. the Better Cotton Initiative and Cotton Made in Africa. These have links to up to 2 million smallholder farmers and are proving receptive to hearing about the success PAN are having in changing practice in Ethiopia. However, this work is not represented in the projects reports or in the many discussions held with the team in Ethiopia. It may be therefore that there is a strategy being followed by the PAN UK team but this is poorly understood by the Ethiopia team.

The Annual Report review made some criticisms of the quality of the technical reports submitted. Since this report the project has made steps to improve the quality assurance process which is positive. It seems that this standard of reporting is suitable for the Ethiopian audience but is unlikely to make a significant impact on the policy environment without substantive behind the scenes work of the Ethiopian Lead through his various contacts.

A more considered communications strategy that identifies who the audience of this work should be and what format these products could take that would have the greatest effect would greatly help this project in affecting change in Ethiopia.

The ecotoxicological monitoring work this project is undertaking is important, even ground-breaking, in terms of what it could mean for Ethiopia's agricultural productivity, the people working in agriculture and its biodiversity. Yet it feels that without effort this project will miss the mark in that it will be unlikely to support both the Government of Ethiopia but also its large agricultural producers to change their practice that will benefit a large number of vulnerable people. The team were able to reference multiple instances where a critical report on practice by the Ministry of Agriculture had a very negative response and in some cases resulted in reduced access to policy makers for the team. Influencing change following these reports required substantive campaigning through many channels to encourage change. A more conciliatory approach may make greater headway in supporting changes in policy than simply the release of a critical report at the close of the Darwin project.

## 2.5. Impact:

**Biodiversity impact is clearly attributable to the project in Arba Minch. The project is boosting local capacity to understand the link between biodiversity, pesticide use and productivity of this region.** The data from this project is directly feeding into local government decision making and as a result of the positive field trials (funded by TRAIID) there is clear commitment to ensure this practice is rolled out to other areas. Therefore there is likely to be a positive biodiversity impact in this region long-term.

**Poverty impact is also clear in the Arba Minch region. Firstly there is an expected health benefit through the reduction of use of harmful pesticides which is measurable using pesticide prevalence as a proxy indicator. Secondly there is an expected benefit through improved cotton yields and thirdly there is an expected benefit through the improved social structures (farming cooperatives and spinning cooperatives) that should secure greater values for cotton and its products. Both are directly measurable.** The spinning cooperatives are specifically focused on women generating a gender benefit.

**Biodiversity impact in the Ziway area is more uncertain than Arba Minch.** There should be greater knowledge of biodiversity and its importance by the staff involved in the project, and there should be greater capacity to monitor biodiversity in this region following Darwin's support. However changes to how pesticide use is managed to improve biodiversity status is directly dependent on the monitoring report expected to be released in the final months of the project. As referenced under section 4.4, the planned format and method of release of the report is unlikely to meet a receptive policy environment.

**Evidence of poverty impact in the Ziway area is also tied up in the monitoring report to be released.** There is expected to be a clear connection between pesticide use by the flower farms and local health. Therefore influencing these flower farms to reduce pesticide use, or to at least better treat the effluent from these farms before its release into the lake, is a valid objective. It is the means by which the project intend to try to influence practice that gives cause for concern. There are few instances in the past where a critical report on practice has been well received by the Ministry of Agriculture or commercial farms and has made any impact on practice in the short-term. It has been necessary for PAN Ethiopia to engage in a sustained campaign through various channels to secure support for changes in practice. The Ethiopian lead is committed to a long-term campaign but an alternative approach to releasing the evidence from this monitoring may reduce the level of effort needed after the project to influence practice in pesticide use in flower farms.

**Recommendation:** Revise the outcome indicators in the logframe so they are capable of capturing the measurable benefits expected at Arba Minch on health, agricultural productivity and resultant financial benefits.

**Recommendation:** Consider how the work at Ziway can be evidenced as progress in terms of both biodiversity and poverty.

## 2.6. Sustainability:

Expansion of alternative pest-management practices in Arba Minch appear to have a strong chance of sustainability given the positive results produced by the project, their strong relationship with the farmers through the Farmer Field Schools and the positive relationship the project has with local Government agencies.

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*'Due to the Darwin project we can reduce this impact and change practice'*

Mr Chengerie Tsala, Arba Minch Ministry of Agriculture, Plant Health Clinic Director,

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The sustainability of the cooperatives (farming and spinning cooperatives) in Arba Minch will probably be heavily dependent on their ability to increase value of products. For farmers it appears to be a small step for them to achieve organic cotton certification and the project has 2 potential buyers of this cotton lined up (H&M and C&A). This work is not entirely attributable to Darwin but Darwin has played a significant role in this work.

Similarly for the women's cooperatives sustainability is dependent on the groups being able to establish better routes to market for their cotton products that can generate higher value for their products. The lead on this aspect is a young social science graduate. She may require some support from marketing professionals therefore to ensure these groups achieve success.

**Recommendation:** Consider drafting in marketing support for the cooperatives (particularly the woman's spinning cooperative) in Arba Minch.

## 2.7. Influence:

Whether this project can achieve the higher level policy influence it wishes for is quite uncertain at this stage.

It is clear the Pan Ethiopian Director is a determined fellow and has had considerable success in the past in influencing thinking at national policy level. He is also well placed on several committees to promote the results of this work. However the project is probably overly reliant on dry technical reports and the persuasiveness of the Director.

In Ziway the flower farms are a significant contributor to the local and national economy and there are many cases in the recent history in Ethiopia of economic development trumping environmental concerns. A more conciliatory approach to this work i.e. working *with* the flower farmers and government to promote change that is economically viable that also produces significant health and biodiversity benefits would be more likely to be sustainable since it will be incorporated into business practice.

**Recommendation:** Reconsider the approach on influencing policy on pesticide use to take a more conciliatory approach.

## 2.8. Innovations, lessons learned and best practice:

**The food spray being tested by this project is very innovative. Not only for the Ethiopian smallholder but it has the potential to revolutionise agricultural practice at the very least in East Africa if not wider.** While the food spray was developed under previous ventures, **it is the monitoring data being produced by the Darwin project that should support its expansion elsewhere in Ethiopia.** It is a low-tech approach that seems to be easily understood and readily accepted by Ethiopian farmers.

**Addressing pesticide impact in the Ethiopian environment as a means of generating biodiversity and poverty benefits is also very innovative. It simply has not been recognised as a problem by national policy before.** Therefore if this team are able to make any headway in improving understanding of the harms pesticides can have on people and the environment and thereby the economy this will be great. How they do so will also be an excellent lesson for others pursuing new and emerging issues in the environment sector in Ethiopia.

There doesn't appear to be a strong lesson learning ethos in Pan Ethiopia. They have attempted to learn lessons from within their own network but have spent little effort trying to understand the efficacy of approaches designed into this project by others outside of their network.

For example, there are many examples of groups influencing practice in flower farms in both Ethiopia and elsewhere in East Africa. Until the review there were no plans to engage with these and attempt to learn lessons to help shape the approach of the Darwin project. This is a lost opportunity. The same is true for the schools education programme. There are multiple examples in development of the success of these programmes in influencing parental behaviour which are not being reviewed.

The team did report some lessons however, particularly around M&E, reporting and communications. This is a fledgling organisation and a small NGO and being funded by an international donor like Darwin has pushed them to develop new ways of operating and reporting. Developing good M&E skills is reported as something they wish to get better at.

**Recommendation:** Seek to understand the lessons emerging from other groups on how to influence practice in flower farms in Ethiopia and elsewhere in East Africa. Expand the point of reference to include issues outside of just pesticide use e.g. water use, Fair Trade etc.

## 3. Review against Programme

### Outcome: Darwin Initiative funded countries have improved capacity to deliver biodiversity and poverty benefits

The project is building capacity in Ethiopia to support biodiversity and poverty benefits through increasing knowledge and capacity to monitor pesticide use (Aichi target strategic goal A) which is a causal agent in the loss of biodiversity and poor health in Ethiopia.

The project is additionally working to reduce direct pressures on biodiversity (Aichi strategic goal B) by supporting farmers to reduce their reliance on pesticides and apply integrated pest management principles. This in turn is resulting in higher yields and greater profits for smallholder and commercial cotton farmers. The next step of the project is to investigate the success of this practice in vegetable farming, another key user of pesticide in the Rift Valley.

Success in field trials of these methods has secured local government support. The next step of the project is to try to secure national support for these methods. This will include engagement with the CBD focal point, Ministry of Agriculture, Ministry of Health and Ministry of Environment. As discussed before, the step to national level engagement and influence is least well defined at this stage and will take some careful planning from the team to ensure there is any impact by the close of the project.

### Output 1: Good applications become good projects

**The project was largely well designed in that all partners were part of the process and have good knowledge of what their role in the work would be.** It was let down however by a poor logframe that doesn't reflect well on the outcome of the work. Therefore the team have found it difficult to demonstrate progress other than at the activity and input level.

**They have made valiant attempts to address the poor logframe twice now with ever more complex M&E plans being developed. Sadly a lack of good understanding of M&E means these have missed the mark, and possibly even increased their work load unnecessarily.**

On the last day of the MTR a session was held with some of the Ethiopian partners to attempt to address the logframe and communications strategy. All were very receptive to this and appeared invigorated by attempts to revise their indicators. However output 5, the output looking at how to influence policy was still unclear to the project team. They need time to investigate the policy environment and consider windows of opportunity for their work to finalise this output and its relevant indicators.

**Recommendation:** Review the new suggested logframe and agree within the Core Darwin Team whether this is acceptable.

**Recommendation:** If the new logframe indicators are acceptable, infill the necessary baseline and target figures in the indicators and report against these in the 2<sup>nd</sup> Annual Report.

**Recommendation:** Ensure by April 2015 that Output 5 has been updated and there are suitable SMART indicators agreed within the team. Report against this in the 2<sup>nd</sup> Annual Report.

## Output 2: there is increase knowledge of the linkages between biodiversity and poverty and mechanisms/approaches that can secure gains in biodiversity and poverty.

**The project is producing new evidence on the links between pesticide use that reduces biodiversity and increases poverty. They are also demonstrating mechanisms that can secure gains in biodiversity and poverty.**

The in-crop monitoring data is robust and is expected to be published as a peer review paper in the future. It is less clear on how the outcrop monitoring (natural forest) data will be used given the evidence presented. If it is to infer impacts on biodiversity as a result of decreased pesticide use it is likely to be of low statistical power. However, as a data-set to be used for long-term monitoring of impacts on the region it will be invaluable.

Currently the audiences of this data are largely local government agencies. There is an expectation that they will seek to influence national policy but how they will do this is unclear at this stage. Their ability to inform other DI/UK funded programmes and projects is low at the moment. They will need to become more strategic in their communications and produce products (such as policy briefs, manuals and blogs) to a more international standard to make significant headway in this.

**Recommendation:** Consider lifting the sights of this work to not only influence Ethiopian government policy but to present the results of this work to Ethiopian donors such as DFID. Consideration will need to be taken of how to present this work to an acceptable international standard to make greatest impact.

## Output 3: Positive gains in poverty alleviation demonstrated in practical biodiversity conservation field projects

**The project will have an impact on household income of 2000 poor farmers in Arba Minch area through increased yields and through increased value of cotton products. There is also expected to be resultant health benefits through reduced exposure to harmful chemicals in the pesticides currently used.**

The current logframe is not capable of capturing the scale of benefits at the HH level but the revised logframe, if accepted by the project lead and edited to include the baseline figures, will give a clear picture of the poverty gains felt at the HH level as a result of this project.

There is not expected to be any new biodiversity management structures, plans or action plans. However the team hope the data produced by this project will influence future management structures and plans such as the National Biodiversity Strategy and the Agricultural policy. This is a long term ambition though.

## Output 4: Capacity to undertake work supporting biodiversity conservation and poverty alleviation

**At least 1 MSc is expected to be achieved through the project for a male Ethiopian staff member of the Institute of Sustainable Development (Mr Redwan Muhammed), one of the Ethiopian partner organisations.**

The Ethiopian lead, Tadesse Amera is already operating well at the national and international level on issues of pesticide use. There is unlikely to be a significant change in his status therefore by the end of the project. However, he is intent on building the capacity of his deputy, Mr Atalo Belay. This suggests that there is a plan for development of junior staff in the organisation which bodes well for continued development of the organisation and therefore capacity in Ethiopia to support biodiversity conservation and poverty alleviation.

## 4. Conclusions

**This is a good project making a positive impact on the lives of smallholder farmers in southern Ethiopia to reduce pesticide use and yet increase their yields through growing cotton organically and applying integrated pest management practices. This is a good example of a project that is able to easily balance the dual objectives of the Darwin Initiative – supporting both biodiversity conservation and poverty alleviation.**

**Where this project struggles is being able to demonstrate its progress and impact in a concise way and coherent way.**

The project has a weak logical framework and a workplan that is very focused on inputs and activities and fails to identify useful output and outcome indicators that are SMART. This has made it very hard to evaluate since often the team are unsure what the expected milestones should be at this stage, or what could be considered evidence of the outcome of their work. This has meant the evaluation has had to be very iterative.

It is clear the Ethiopian Lead is a dynamic and determined man who has had considerable success in the past in raising the awareness of pesticide use and its harm in Ethiopia. One of these successes has been in establishing PAN Ethiopia, a relatively new NGO and probably the only one in Ethiopia to specifically target pesticide use. This is a fledgling organisation though

with a largely new team (many have joined in the last 12 months). With the lack of comprehensive monitoring plan, often it is the Ethiopian Lead who is the only one able to answer questions on the expected impacts of this project.

The work in Arba Minch is showing good evidence that the work of the project will contribute to both biodiversity and poverty gains from reducing pesticide use in cotton farming. **From the people met and the evidence presented there is a good chance that this work will have significant impact on the target beneficiaries (2000 farmers and 60 women) and long-term the number of beneficiaries of this work will expand substantially.**

In Ziway, the project has made considerably less progress and appears to be ignoring opportunities to learn from others efforts, in both Ethiopia and East Africa to influence practice in pesticide use. It is unclear as to whether the schools awareness raising work will have the hoped for impact on farming practice in the region.

## 5. Recommendations

In general there are 2 main recommendations to this project.

- 1) Review the logical framework along the lines of the proposed new logframe that captures the benefits achieved by this project to both biodiversity and poverty using SMART indicators
- 2) Develop a coherent communications strategy that identifies suitable audiences for this work and in what format the final products of this work could have greatest impact with.

Below are all the recommendations from the report grouped by theme.

### 5.1. Monitoring and evaluation specific recommendations

- Revise the logical framework paying particular attention to the outcome level indicators which currently are not SMART.
- Revise the outcome indicators in the logframe so they are capable of capturing the measurable benefits expected at Arba Minch on health, agricultural productivity and resultant financial benefits.
- Review the new suggested logframe and agree within the Core Darwin Team whether this is acceptable.
- If the new logframe indicators are acceptable, infill the necessary baseline and target figures in the indicators and report against these in the 2nd Annual Report.
- Ensure by April 2015 that Output 5 has been updated and there are suitable SMART indicators agreed within the team. Report against this in the 2nd Annual Report.
- Consider how the work at Ziway can be evidenced as progress in terms of both biodiversity and poverty.

- Ensure when discussing the benefits of this project that you comment on both biodiversity and poverty gains expected as a result.
- Attribution of the success of the IPM and food spray techniques to increase yields should be attributed in part to Darwin funding and in part to TRAIID funding. Reporting on this project should take care to make this clear.

## 5.2. Route to influencing policy specific recommendations

- Develop a coherent communications strategy to ensure the results of this ecotoxicological monitoring can support the government and private sector to change practice that is beneficial to environment, human health and doesn't stunt economic growth unreasonably. This should include a review of the relevant actors that could support this work and a review of the types of products that could support this work including policy briefing notes.
- Consider lifting the sights of this work to not only influence Ethiopian government policy but to present the results of this work to Ethiopian donors such as DFID. Consideration will need to be taken of how to present this work to an acceptable international standard to make greatest impact.
- Seek to understand the lessons emerging from other groups on how to influence changes in practice in flower farms in Ethiopia and elsewhere in East Africa. Expand the point of reference to include issues outside of just pesticide use e.g. water use, Fair Trade etc.
- Given the Ziway report is not expected to be ready until the final months of the project consider ways in which to smooth the way of this report to ensure a more receptive policy environment.
- Reconsider the approach on influencing policy on pesticide use to take a more conciliatory approach.

## 5.3. Project design specific recommendation

- Consider drafting in marketing support for the cooperatives (particularly the woman's spinning cooperative) in Arba Minch.
- Revise the logic regarding how best to influence agricultural practice in Ziway. Consider scaling back activities on the school work to target farming practice through more cost-effective channels.

# Annex 1: Original logframe

<b>IMPACT (100 words)</b>	<p>The project will contribute to Ethiopia's effective implementation of the Conventions on Biological Diversity and Conservation of Migratory Species. It will help to: reduce adverse impacts of pesticides on ecosystems in the Rift Valley wetlands, including the food chains on which key migratory birds depend; improve ecological quality of water resources; and foster communities' participation in addressing environmental harm.</p> <p>It will help show how productive, agro-ecological farming practices that reduce reliance on expensive agrochemicals can conserve wildlife and protect ecological services while increasing farmer incomes, thereby improving the livelihoods, food security and welfare of rural communities.</p>		
<b>1 outcome (100 words)</b>	<b>INDICATORS</b>	<b>SOURCES (publications, surveys, project notes, reports, tapes, videos etc.)</b>	<b>ASSUMPTIONS</b>
<p>Improved capacity of Ethiopian farming communities, government agencies and other stakeholders to (a) identify and understand the harmful environmental effects of agrochemical use close to biodiversity-rich wetlands, (b) develop and implement practical solutions based on agroecological farming and (c) align agricultural policies with biodiversity conservation goals.</p> <p>Farming communities around the Rift Valley Lakes will benefit from safer and sustainable pest management, better water quality and ecosystem services. Government agencies and conservation bodies will gain the skills to monitor pesticide impacts jointly with rural communities and feed robust evidence</p>	<p>1 Capacity strengthened in Ethiopia in use of an ecosystem approach to pesticide impact monitoring in the field, with data collected on key species in aquatic food chains.</p> <p>2 Farmers trained in IPM and organic methods are implementing by year 3 more sustainable pest management using less pesticide, while maintaining crop yields and earning better net returns.</p> <p>3 Enhanced understanding at farmer and national levels of the value of biodiversity and the indirect costs of pesticide effects on wildlife and ecosystem services helps ensure that agroecological farming strategies become mainstreamed into national policies on agriculture and</p>	<p>Ecotox curriculum and training reports; survey data, monitoring data and chemical analysis reports; stakeholder assessment notes.</p> <p>Programme data and farmers' feedback on training success, changes achieved in pest management methods, reductions in pesticide use, yields, production costs and income</p> <p>Quantitative and qualitative data from training, workshops, discussion and policy forums on changes in awareness of pesticide effects on biodiversity, changes in stakeholder perceptions on the role of pesticides and their costs and benefits.</p>	<p>Physical and political conditions permit effective monitoring in Rift Valley.</p> <p>Physical and political conditions permit effective training in Rift Valley. Farmers motivated to take part and alternative pest management methods are effective.</p> <p>Government agencies, conservation bodies, Rift Valley communities and others are committed to the project and make active use of the findings.</p>

into policy forums.	environment.		
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OUTPUTS	INDICATORS	SOURCES	ASSUMPTIONS
1 National capacity built in ecotoxicological monitoring, with a focus on pesticide use in the Ethiopian Rift Valley, enabling assessment of pesticide contamination and impact on wildlife and food chains of which migratory birds are part	<p>1.1 Core group of staff from at least 3 different government agencies and NGOs trained and enabled to conduct robust monitoring programme and assess the results.</p> <p>1.2 Effective multi-stakeholder steering group established to provide oversight to monitoring activities</p>	<p>Training curriculum; evaluation notes from trainers and trainees; feedback from NRG experts on draft monitoring programme designs developed by trainees</p> <p>Meeting reports of steering group; range of organisations involved</p>	<p>Appropriate staff selected for training and remain in post.</p> <p>Government agencies, NGOs and other stakeholders maintain commitment.</p>
2 Baseline understanding compiled of current biodiversity, pesticide use patterns and effects on key species in aquatic ecosystems, to enable changes in status to be evaluated later	<p>2.1 Baseline data collected in Years 1-2 on: aquatic food chains and biodiversity in Rift Valley wetlands; pesticide use in surrounding farmland and contamination levels in lakes and wetlands; cotton production costs, yields, returns and pest management methods</p> <p>2.3 Results and quality of data generated on pesticide impacts on ecosystem processes</p>	<p>Survey data reports; chemical analysis reports; existing literature on Rift Valley biodiversity;</p>	<p>Physical conditions permit adequate data to be collected and trained staff gain the skills to assess data properly.</p> <p>Training and involvement of local people in monitoring activities</p>
3. Increased uptake of agro-ecological farming methods by trained farmers in cotton-growing project sites (smallholder + plantations)	<p>3.1 Number of smallholder farmers and plantation managers and farmworkers trained in IPM/ organic methods</p> <p>3.2 Data on pesticide use; yields; income/profit of trained versus untrained farmers</p> <p>3.3 Number of farmers adopting at least some alternative pest control techniques</p>	<p>Training reports</p> <p>Relevant survey data from Output 2</p> <p>Survey data reports, feedback from farmer workshops, data from organic certification</p>	<p>Smallholder farmers and large cotton farm owners and managers are motivated to take part in training and then make changes in their farming practices</p> <p>Farmers are convinced that they can obtain clear economic and/or other benefits by shifting to agro-ecological strategies</p>

			bodies	
4	Enhanced awareness by rural communities, government agencies and other stakeholders of the adverse effects of pesticide use on Rift Valley aquatic ecosystems and farming livelihoods and of the measures needed to address these	<p>4.1 Number of local community members (men, women, school groups) attending project events (workshops, field days, etc) and involved in monitoring</p> <p>4.2 Local level recommendations and action plans developed after monitoring results are discussed</p> <p>3.3 Changes in attitude and practices of stakeholders to reduce pollution from pesticide use</p> <p>4.4 Community representatives collaborating with government agencies to address specific pesticide contamination problems</p>	<p>Reports from community-based monitoring and stakeholder workshops; informal feedback from local NGOs, community groups and government agencies</p>	<p>Local community groups are motivated to take part in monitoring and developing measures to address problems.</p> <p>Government agencies, NGOs and other stakeholders maintain commitment.</p>
5	National Biodiversity & Agriculture Stakeholder Group established to provide supportive policy environment for sound agricultural practices that conserve biodiversity	<p>5.1 NBASG set up with at least 7 organisations represented covering relevant Ministries, conservation bodies, farmer associations and community groups</p> <p>5.3 NBASG advocates for agroecological farming as part of national policies on agriculture, biodiversity conservation</p> <p>5.2 NBASG deliberations include ecotox monitoring results, the external costs of pesticide harm and the role of pesticides</p>	<p>NBASG meeting participant lists, reports and recommendations</p>	<p>Appropriate government agency takes the lead in convening NBASG and stakeholders motivated to continue participation</p>

in food security

6	Project training methods, monitoring results and lessons emerging are made available to relevant stakeholders elsewhere in Ethiopia and beyond	6.1 Ethiopian partners disseminate findings, action plans and policy recommendations through their networks. 6.2 Project lessons and guidance on community participation in ecosystem approaches disseminated via relevant meetings of CBD, CMS, PIC, POPS and other chemical conventions. 6.3 Project findings, methodology and lessons disseminated to global research, conservation, donor and NGO audiences.	Project reports, publications, presentations at national and international forums Toolkits, training manuals, case studies. Peer-reviewed papers, articles in conservation and development journals and websites, partners' publications.	Stakeholders at national and international levels express interest in the findings and policy implications.
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# Annex 2: Proposed revised logframe

Where **xx** is highlighted this is for the team to infill the relevant information.

In filled boxes indicate where the text has been altered from the original.

<b>IMPACT (100 words)</b>	<p>The project will contribute to Ethiopia’s effective implementation of the Conventions on Biological Diversity and Conservation of Migratory Species. It will help to: reduce adverse impacts of pesticides on ecosystems in the Rift Valley wetlands, including the food chains on which key migratory birds depend; improve ecological quality of water resources; and foster communities’ participation in addressing environmental harm.</p> <p>It will help show how productive, agro-ecological farming practices that reduce reliance on expensive agrochemicals can conserve wildlife and protect ecological services while increasing farmer incomes, thereby improving the livelihoods, food security and welfare of rural communities.</p>		
<b>1 outcome (100 words)</b>	<b>INDICATORS</b>	<b>SOURCES (publications, surveys, project notes, reports, tapes, videos etc.)</b>	<b>ASSUMPTIONS</b>
<p>Improved capacity of Ethiopian farming communities, government agencies and other stakeholders to (a) identify and understand the harmful environmental effects of agrochemical use close to biodiversity-rich wetlands, (b) develop and implement practical solutions based on agroecological farming and (c) align agricultural policies with biodiversity conservation goals.</p> <p>Farming communities around the Rift Valley Lakes will benefit from safer and sustainable pest management, better water quality and ecosystem services.</p>	<p>1 Job description and desk officer assigned to continue biodiversity monitoring in <b>xx</b> institution by year 3.</p>		<p>Increased awareness of the value of biodiversity leads to action at local level</p>
	<p>2 Pesticides use with known health impacts has reduced from <b>xx</b> per hectare to <b>xx</b> hectare by year 3.</p>		<p>Increased knowledge leads to reduced pesticide use</p>
	<p>3 Women’s spinning cooperatives members (60 women) have at least <b>xx</b> Birr in savings compared to a baseline of zero by year 3.</p>		<p>Decreased pesticide use leads to improvements in human health and biodiversity gains.</p>
	<p>4 Members of famers cooperatives (<b>xx</b> men and <b>xx</b> women) achieve <b>xx</b> Birr per quintile compared to <b>xx</b> Birr per quintile at baseline by year 3.</p>		

Government agencies and conservation bodies will gain the skills to monitor pesticide impacts jointly with rural communities and feed robust evidence into policy forums.	5	Policy change indicator to be developed here.		
OUTPUTS	INDICATORS		SOURCES	ASSUMPTIONS
1	Monitoring data presents robust evidence of pesticide use and its impacts	1.1 Ziway report on pesticide use is published by year 3 1.2 Arba report on pesticide use is published by year 3.		Policy is evidence led in Ethiopia
2	Knowledge of the relationship between biodiversity and development is held by local government and communities	2.1 Cotton farmers are able to identify the difference between pests and farmers friends as evidenced by either data from a counterfactual or Most Significant Change. 2.2 Investor screening process used by Awas includes consideration of pesticide use		Educating children is an effective means of influencing agricultural practice by parents
3.	Alternative pest management methods including food spray and integrated pest management are scaled up	3.1 Agricultural extension workers teaching IPM and food spray methods increases from xx at baseline to xx by year 3. 3.2 Farmers implementing IPM and food spray pest control methods increase from xx at baseline to xx by year 3. <b>Note:</b> it would be ideal if this could be disaggregated by gender i.e. # of female farmers and # of male farmers.		Traditional knowledge is not contrary to new methods  Technology is accessible to farmers

<p>4. Cooperatives established for cotton farmers and women (spinning cooperative) that increase access to market and enhance value of crops</p>	<p>4.1 Registration of xx women's group (with xx members) as a Saving Association by year 2.</p> <p>4.2 xx cotton cooperative's (with xx male and xx female members) registered with Marketing and Cooperatives Board by year 3.</p>
<p>5. Knowledge and data are presented that seek to influence policy and practice on pesticide use</p>	<p>5.1 To be developed by April 2015</p> <p>5.2 To be developed by April 2015</p>

Policy environment is receptive

Team have sufficient knowledge of policy environment to influence it

## Annex 3: People consulted

Name	Institution
Tadesse Amera	PAN Ethiopia
Atalo Belay	PAN Ethiopia
Zemenu Genet	PAN Ethiopia
Meskerem Genet	PAN Ethiopia
Leulseged Mulugeta	PAN Ethiopia
Bazezew Gebremariam	PAN Ethiopia
Tefaye Gebrie	PAN Ethiopia
Sue Edwards	Institute for Sustainable Development
Redwan Muhammed	Institute for Sustainable Development
Yilma Delelegn	Ethiopian Wildlife and Natural History Society
Mekonnen Amberber	Ethiopian Institute of Biodiversity
Dr Tarekegn Berhanu	Ministry of Agriculture
Chengerie Tsala	Arba Minch Agriculture Office/ Plant Health Clinic
Mulualem Mersha	Arba Minch Agriculture Office/ Plant Health Clinic
Mr Yemane	Arba Minch Agriculture Office/ Plant Health Clinic
Ms Biya	Arba Minch Agriculture Office/ Plant Health Clinic
Mr Bizuayehu	Arba Minch farmer
Mr Menza Maile	Arba Minch farmer
Mr Chubero	Arba Minch farmer