# Darwin Initiative Main: Annual Report

To be completed with reference to the "Project Reporting Information Note":
(https://www.darwininitiative.org.uk/resources/information-notes/)

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes)

**Submission Deadline: 30th April 2024**

**Submit to: BCF-Reports@niras.com including your project ref in the subject line**

## Darwin Initiative Project Information

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|---|---|
| Project reference | 29-021 |
| Project title | More bees: Supporting agrobiodiversity and livelihoods in Amhara, Ethiopia |
| Country/ies | Ethiopia |
| Lead Partner | Bees for Development |
| Project partner(s) | Bees for Development Ethiopia, Pesticide Action Nexus Ethiopia, Pesticide Action Network UK, Bahir Dar University |
| Darwin Initiative grant value | £ 352,927 |
| Start/end dates of project | 01 June 2022 to 31 March 2025 |
| Reporting period (e.g. Apr 2023 – Mar 2024) and number (e.g. Annual Report 1, 2, 3) | April 2023 to March 2024 and Annual Report 2 |
| Project Leader name | Janet Lowore |
| Project website/blog/social media | More Bees: Supporting Agrobiodiveristy and Livelihoods in Amhara - Bees for Development |
| Report author(s) and date | Janet Lowore and Baye Getahun, May 2024 |

## 1. Project summary

Successive assessments, community consultations and surveys (2018-2021) identified the core problem which this Project (***More Bees***) is seeking to address – namely the loss of bees, due to intensive use of pesticides, in some locations in Amhara, Ethiopia. The Project is designed to address this major driver of biodiversity loss, specifically in relation to bees and other beneficial insects. The most evident problem perceived by smallholders is that beekeeping, previously important for income, is becoming non-viable, with loss of income. Where viable, beekeeping income contributes up to 40% of household income. In one survey conducted in the same Project area, in the year before the Project started, farmers reported keeping ten times fewer bee colonies, attributing losses to pesticides. Chemical application is the only pest control method used by target population. The Project is highly relevant for local farmers and for informing higher-level decision makers in the agriculture sector in Ethiopia. It is relevant because it addresses the underlying reasons for farmers' overreliance on pesticides i.e. lack of awareness of alternatives, limited knowledge of integrated pest management (IPM) and lack of understanding of the environmental and health risks. The Project is building understanding, knowledge and skills on i) alternative pest control practices, ii) role of natural enemies of crop pests, iii) role of bees and pollinators in fruit/seed development. Other problems of pesticides reported by farmers, in addition to loss of bees, include harm to human health and high cost. In addition, the Project

helps to enhance farmers', agriculture extension workers' and policy makers' understanding about the role of pollinators in crop yield and quality, and of biodiversity conservation.

This project is taking place where vegetables are grown using irrigation and one particular crop of note – grass pea (*Lathyrus sativa*) – is grown using residual moisture. Grass pea, whilst having lower value than irrigated vegetables, is an important focus crop because changes in the way the crop is managed could have large-scale, long-range (post-project) impact on pesticide use, for the following reasons:

- It is grown very widely in Amhara, so if farmers find it possible to use less pesticide on this crop – the cumulative impact, across the landscape will potentially be very large.
- It is highly attractive to honey bees (and other bees) and is the crop which beekeepers point to most strongly as the 'bee-killing' crop – being both highly foraged by bees and highly sprayed.
- It is grown by more farmers, across more landscapes, than irrigated vegetables. Successful demonstration and adoption of IPM, instead of frequent applications of organophosphates, could significantly impact on insect density, honey bee welfare, farmers' pockets, farmers' health and the wider environment.

The Project is being implemented in Fogera district of South Gondar Zone and North-Mecha district of West Gojjam Zone in Amhara Region, Ethiopia. Most of these districts are plains areas covered with large irrigation-based vegetable farming and in Fogera, residual-moisture based pulse crop production.

In 2023/24 the Project could not work in North-Mecha due to insecurity and conflict – see section 11.

## 2. Project stakeholders/ partners

This project is being delivered by the following partner organisations in a fully collaborative approach:

Bees for Development UK

Bees for Development Ethiopia

Pesticide Action Nexus Ethiopia

Pesticide Action Network UK

Bahir Dar University

With support from Mike Edwards of Edwards Ecological and Data Service Ltd.

Roles and responsibilities are shared according to expertise, capacity and skills. Bees for Development Ethiopia are taking the lead in terms of implementation. Colleagues meet regularly online to discuss plans and approaches. To give an example of strong collaborative effort – all partner organisations worked to create a grass pea IPM protocol to support the IPM Farmer Field Schools this year. This included Dr. Adane bringing in his experience of grass pea management and drawing on academic research of assessing insects in similar crops, Pesticide Action Network bringing in their experience of how develop methods that are practical and feasible for farmers – with Bees for Development providing support with regards to documentation and implementation.

To give another example, when Dr. Stephanie Williamson visited Ethiopia to visit the PAN project sites, she invited the fieldworker from Bahir Dar to join her trip to the south of Ethiopia and made arrangements for an update meeting with staff from BfDE in Addis Ababa. Dr.Williamson visited Bees for Development in Monmouth, UK, in June 2023 and gave a seminar on dangers of growing pesticide use in developing countries. The seminar participants were from Ghana, Zimbabwe and India. This was not directly related to this project – but an outcome of collaborative working.

During those times when travel to Bahir Dar was ill-advised Dr. Adane was able to take up some of the responsibilities of PAN-Ethiopia (they are not based on Bahir Dar).

Overall, the partnership remains strongly collaborative and successful.

Please see Evidence 6 - Newsletter

## 3. Project progress

### 3.1 Progress in carrying out project Activities

Despite the challenges presented by the insecurity and conflict situation in Amhara in 2023 we have achieved the following activities:

**Output 1.**

Act 1.2 16 Development Agents (11m, 5w) from four kebele[1] in Fogera received training in March 2024. The training focused on importance of pollination, types of pollinators and natural enemies of crop insect pests, the role of beneficial insects in crop production and approaches to safeguarding ecosystem services.

Act 1.3 235 farmers (165m, 70w) from four kebele in Fogera received training in March 2024. The training was aimed on the role of pollinators and natural enemies in sustainable agriculture and the dangers of overuse and over-reliance on chemical pesticides.

Act 1.7 Pollinator monitoring was being done at 6 permanent sample sites in the two woreda[2] on a bi-weekly basis. This work was interrupted due to the conflict – but was resumed in Fogera only. In total, across both districts and both years, 116 records have been taken. Not yet analysed.

**Output 2.**

Act 2.1 IPM training was delivered by PAN Ethiopia to the Development Agents from the Year 2 kebele (those reached for the first time in Year 2). 6 men and 2 women from Shina and Kokit received introductory training about IPM. January 2024.

Act 2.2 Farmers (166m, 70w) were introduced to IPM in a training session in March 2024. This was delayed due to the state of insecurity. Farmers learned about different types of pesticides and the basics of IPM and what this entails. Botanicals, mechanical, physical, biological, anti-pest plant, quarantine and chemical control methods were discussed.

Act 2.3 and Act 2.4 Eight Farmer Field School IPM trials were established in November 2023, in four kebele in Fogera. With supervision from fieldworkers, the farmers have been making weekly assessments of the crop, pests and numbers of natural enemies and making decisions about pest control using IPM. Data was collected from farmers' equivalent normal practice plots at the same time / place.

| Woreda | Kebeles | Type of crop | Number of Farmers | | |
|---|---|---|---|---|---|
| | | | Male | Female | Total |
| Fogera | Kuhar-Abo | Onion | 22 | 8 | 30 |
| | | Grass Pea | 21 | 9 | 30 |
| | Kuhar-Michael | Onion | 18 | 12 | 30 |
| | | Grass Pea | 20 | 10 | 30 |
| | Abuana-Kokit | Onion | 20 | 10 | 30 |
| | | Grass Pea | 23 | 7 | 30 |
| | Shina | Onion | 18 | 12 | 30 |
| | | Grass Pea | 21 | 9 | 30 |
| Total | | | **163** | **77** | **240** |

Act 2.5 A farmers' field day programme was organized in March 2024. The IPM-FFS plots of onion and grass pea crops at Kuhar Michael, Fogera woreda were visited by 102 farmers and 18 government extension staff. The objective of the programme was to demonstrate IPM-FFS practice on the production of onion and grass pea as compared to farmers' practice.

[1] Kebele = village

[2] Woreda = district

Act 2.6 We planned to deliver a results sharing workshop after all Year 1 analysis was done. At the time we were ready to deliver this activity – conflict broke out and it was not done. We will deliver a combined Year 1 and Year 2 results sharing workshop in 2024.

**Output 3.**

Act 3.2 and 3.4. 114 new beekeepers (80m, 34w) received training in June 2023. This was before the conflict broke out. They were trained in how to make hives, how to get bees, basic beekeeping, how to boost forage availability and protect honey bees from pesticides.

Act 3.5 New beekeepers (see above) and existing beekeepers (pre-project) who were trained in 2022 were assisted with appropriate inputs and support. Total number supported = 192 beekeepers (146m, 46w). This activity was delayed due to conflict but was completed by end of September 2023.

**Output 4.**

Act 4.4 Newsletter was published and shared. See Annex 5.

The policy analysis workshop was not done – due to a number of reasons. The conflict has caused a delay with activities towards achieving Outputs 1-3 and Output 2 in particular was extremely season-dependent and had to be 'squeezed' into the available months. A key staff member also left the organisation at the end of 2023. These pressures, plus the travel bans and prevailing insecurity meant it was not possible to organise this workshop in a timely manner. It was decided it would be prudent to re-schedule to the final Year rather than rush.

We will focus on writing materials and guidance notes in the final year also.

## 3.2 Progress towards project Outputs

**Output 1. Smallholder farmers and government extension workers in Fogera and Mecha have a good working understanding of their local agro-ecosystem.**

This output concerns evidence of new knowledge and understanding and whether/how the new knowledge and understanding is impinging on the practices of farmers and development agents. We undertook a baseline survey in 2022 and compare progress against that.

1.1 and 1.4 All DAs were trained in Year 1 and those in Fogera only received some additional training in Year 2. Here we report on changes in their knowledge, understanding and practice.
1.3 and 1.4 235 Year 2 farmers in Fogera received training for the first time. Here we report on change in their knowledge, understanding and practice against baseline.
1.5 No update on Year 1
1.6 No update on Year 1.
1.7. NE and pest counts were done in 8 IPM plots in Year 2. Results not yet compiled – except one see below.

**Development Agents' knowledge and understanding.**

Rapid survey in April 2024 revealed that 8 Development Agents interviewed had attended all the training provided by the project and had acquired good knowledge and understanding, as evidenced here:

Questions about pesticides

All said that there were problems associated with pesticide use as follows:

| | | Said yes? |
|---|---|---|
| Risk of poisoning the person applying the spray | | 10 |
| Risk of harming livestock | | 10 |
| Risk of harming bees | | 10 |
| Risk of harm caused to other family members (i.e. not those applying the | | 8 |
| Risk of harm to farmers' friends (other beneficial insects) | | 8 |
| Risk of contaminating soil and water | | 9 |
| Risk of health effects for the people who eat the food crop - the consumer | | 7 |

| | | |
|---|---|---|
| High cost of pesticides | | 10 |
| Difficulty of getting hold of pesticides at the right time | | 1 |
| Difficulty of getting the preferred or most effective chemicals | | 5 |
| Consumers don't want pesticides on their food | | 5 |
| Pests are becoming resistant to pesticides | | 10 |
| Traders and retailers are strict about which pesticides can be used | | 0 |

All said that their understanding had changed *because of the project.*

Other knowledge and understanding

| **Question** | |
|---|---|
| Apart from honey bees do you think there are other beneficial insects? | 9/10 said *Yes, many - I think there are many beneficial insects in addition to honey bees*<br>1/10 said *A small number - I think there are a few kinds of other insects, in addition to honey bees, which are beneficial* |
| Do you think it is important for farmers to try and destroy all the insects present in vegetable fields? | 9/10 said, *No* |
| Have you participated in all the training sessions delivered by Bees for Development Ethiopia in this Project? | 10/10 said, *Yes* |
| How do you rate the learning experience? | 10/10 said, *The learning has been very valuable and useful* |

**Farmers' knowledge and understanding.**

Our baseline survey revealed levels of understanding at Project start (see Annex 6). To measure Output Indicator 1.3 and 1.4 farmer knowledge and understanding about local agroecosystem, pollination and beneficial insects and harm causes by pesticides - six questions[3] were asked and against each there were different possible answers. A maximum score of 25 was achievable by those exhibiting good understanding, knowledge and practice.

| | | Max score | Baseline | April 2023 | April 2024 |
|---|---|---|---|---|---|
| Indic 1.3 and 1.4 | Year 1 farmers | 25 | 5.63 (mean)<br>3 (median) | 8.96 (mean)<br>9 (median) | 11.8 (mean)<br>12 (median) |
| Indic 1.3 and 1.4 | Year 2 farmers | 25 | 5.63 (mean)<br>3 (median) | No measure | 11.9 (mean)<br>12 (median) |

These results show that farmers' knowledge and understanding against these measures are improving. All are averages.

**Insect numbers.**

Counts of natural enemies in IPM plots compared to farmers' plots shows that there is a greater density of natural enemies in IPM plots. To date the results of one Year 2 trial have been compiled (see Evidence 7) – these show there to be over 4x as many natural enemies in IPM fields as in farmers' normal practice fields.

Landscape scale pollinator monitoring was interrupted by insecurity – see our reporting against Outcome Indicator 4.

**Output 2 Integrated pest management approaches adopted by smallholders in Fogera and Mecha.**

[3] The six questions are shown in Annex 6

This output concerns learning and practising IPM.

Indic 2.1 10 Development Agents were trained in Year 2. We assessed the knowledge and understanding DAs from both years in a rapid survey (n=10) in April 24. Results reported here.

| Question | Answers |
|---|---|
| What do you think it the best way to control pests and diseases in crops? | 10/10 said *Good cultural practices (e.g. proper land preparation, rotation cropping, inter-cropping or similar)*<br>10/10 said *Making use of farmers' friends*<br>6/10 said *Using chemicals* |
| Do you understand about the role of Farmer's Friends[4] insects in farms? | 10/10 said *Yes* |
| Do you think it is important to encourage Farmers Friends? | 10/10 said *Yes* |
| How can Farmers Friends by encouraged? | 9/10 said *Leave some natural vegetation or some weeds in and around fields for Farmer's Friends*<br>10/10 said *Sow alfalfa or maize borders as habitat for Farmer's Friends*<br>10/10 said *Apply food spray to attract Farmer's Friends* |
| Will you recommend farmers' adopt IPM? | 10/10 said *I will start next year*<br>0/10 said *I am already doing it* |
| Will you recommend farmers to reduce pesticide use in the future? | 10/10 said *Yes* |

**Indic 2.2** In this reporting period 166m, 70w farmers learned about IPM. In the rapid survey this cohort (the Year 2 cohort) evidenced what they had learned as follows:

The Baseline Survey asked and scored three questions [What do you think it the best way to control pests and diseases? Do you take steps to encourage Farmers Friend insects? What IPM do you practice?] with a maximum score of 21. A sample of Year 2 cohort (20) were interviewed in April 2024. The results indicated an improvement – see below. Furthermore, all those interviewed said that they intended to apply the new IPM practices that they had learned, in their own farms next season.

| | | Max score | Baseline | April 2023 | April 2024 |
|---|---|---|---|---|---|
| Indic 2.2 | Year 1 farmers (35 sampled) | 21 | 3.89 (mean)<br>2 (median) | 6.78 (mean)<br>7 (median) | 11 (mean)<br>10 (median) |
| Indic 2.2 | Year 2 farmers (20 sampled) | 21 | 3.89 (mean)<br>2 (median) | No measure | 10 (mean)<br>9 (median) |

All are averages.

**Indic 2.3** The target was to set-up 12 FFS-IPM trials in 2 woreda. Due to insecurity we did 8 in one woreda instead – 4 onion and 4 grass pea. See the table in Activities under Output 2.

Data has been collected, but not yet fully compiled and analysed.

[4] Different term for natural enemies

***Grass pea IPM trial in Shina.***

**Indic 2.4** Farmers are gaining skills in IPM through participation in Farmer Field School. See the table in Activities under Output 2.

**Indic 2.5** Farmers learn results of IPM trials through field visits. In this reporting period the IPM-FFS plots of onion and grass pea crops at Kuhar Michael, Fogera woreda were visited by 102 farmers and 18 government extension staff. The objective of the programme was to demonstrate IPM-FFS practice on the production of onion and grass pea as compared to farmers' practice.

Extract from report from the day, '*Our IPM plot was sprayed with neem extract 4 times while the conventional plots in both crops were sprayed with chemical pesticides 10 times. When they observed the yield performance of onion and podding performance of grass pea, they convince themselves and said, "we are affecting our environment without any yield advantage". According to the farmers applying these pesticides especially on grass pea is also affecting their cattle, because they use the straw of grass pea as a feed for their cattle and because of the application of these chemicals their cattle are losing their health. Accordingly, farmers are convinced themselves to use the IPM approach and to teach others*'.

**Indic 2.6** We planned to deliver a results sharing workshop after all Year 1 analysis was done. At the time we were ready to deliver this activity – conflict broke out and it was not done. We will deliver a combined Year 1 and Year 2 results sharing workshop in 2024.

**Output 3. Beekeeping enterprises established and re-established by smallholder farmers.**

Activities against Output 3 are reported above. Indicators under this output concern skills, knowledge and number of colonies kept. In the reporting period 114 new beekeepers were trained. It was assumed that their beekeeping skill and number of bee colonies was zero before training. The rapid survey undertaken in April 2024 interviewed 10 of the new beekeepers (admittedly a low number and might not be representative).

| | | Responses n=10 [4women,6men] |
|---|---|---|
| Indic 3.2 | New beekeepers know how to make hives, establish apiaries, manage bees<br>Beekeepers were asked 4 questions to which they could answer 'cannot do = 0', 'can do with technical guidance = 1', 'fully confident = 2' . Max score = 2x4 = 8.<br>The four questions were:<br>Can you make a woven hive? Can you make a top-bar hive? Can you set up an | The average score was 5.6/8<br>This is considered satisfactory progress after one year. |

| | | |
|---|---|---|
| | apiary? Can you manage the bees during the dearth period? | |
| Indic 3.5 | New beekeepers start beekeeping | All had started beekeeping and had at least 2 bee colonies |
| Indic 3.6 | New beekeepers sell honey | Only one had sold honey – which is to be expected as they have only just started. |

Our baseline survey of existing beekeepers shows a very significant range in terms of scale of beekeeping activity – in this regard averages across a small sample, might not be the best way to assess progress. In the final year as we move towards final reporting and evaluation we will deliver improved M&E approaches for Output 3 – based on a combination of methods (questionnaires, in-depth interviews, apiary visits). We will also try to disaggregate better – new, existing, men, women, small-scale, large-scale.

In the **baseline survey** of existing beekeepers

42 had 1-4 colonies

36 had 5-8 colonies

17 had 9-12 colonies

5 had 13-16 colonies

1 had 17-20 colonies

15 had more than 22, with one with 60 colonies

**Output 4. Farmers, government extension workers and other stakeholders have good understanding about instruments and guidelines to support biodiversity-friendly agriculture.**

**Indicator 4.1 Workshop was held in Year 1.**

Ato Abyote, the head of the Koga Irrigation scheme from North Mecha and Debrie Kassa, team leader from Environment Office, from Fogera, attended the policy familiarisation workshop last year. When asked, both of them acknowledged the learning achieved at the workshop but said that there was no change in government policy. However, they have tried to do their work differently – for example advising farmers to avoid applying pesticides when bees are flying. They also noted that farmers' awareness about IPM is improving but they said change takes time.

**Indicator 4.4 Newsletter produced, shared and available from partner organisations websites.**

**See Evidence 1 below.**

Little progress achieved against other indicators against Output 4. Four months of work time were lost during the height of the State of Emergency and this meant we had to prioritise what work could be done and the FFS-IPM trials were prioritised.

## 3.3 Progress towards the project Outcome

We have set five indicators to measure progress towards the Project Outcome.

| No. | | Baseline and progress | Comment |
|---|---|---|---|
| 1 | 900 smallholder farmers [40% F = 360 F] adopt IPM practices, and reduce frequency of application of pesticides on irrigated vegetables and pulses grown with residual | Baseline Survey showed that the average number of times pesticides applied across 7 crops was 7.73. This figure was supported by the farmer-managed plot we used to compare with | Given that the operational context is a challenging one … the IPM Farmer Field Schools are proving very promising. Year 2 results are |

| | | | |
|---|---|---|---|
| | moisture, by end of project. Target is to cut frequency by at least half, against baseline, by end of project. | the first onion trial (in Year 1) where Profenofos was applied 8 times.<br><br>Year 1 results – see Annex 5 – show that all onion trials produced greater yields with reduced pesticide application. The pepper and grass pea trials did not – but we struggled with the assessment method for the grass pea, and the pepper trials was economically better, even though yield was low. | not yet out[5] – but appear to be performing well.<br><br>We were hopeful that the farmers who participated in the FFS in Year 1 would have reduced pesticide application frequency in this season – by using methods they learned. Our rapid random survey did not indicate this to be the case with most saying that they were still applying the same frequency of pesticides as 'usual'.<br><br>This prompted us to investigate more widely and deeply with Year 1 farmers and we learned that there are no understanding and perception problems with the participant farmers about IPM. They like the technology very much and are ready to practice IPM in their own farms. Out of the 180 farmers who participated in FFS in Year 1 – **25 (14%) have reduced pesticide use by between 25% to 50%.** Unfortunately, there is a problem of neem seed availability.<br><br>Work in progress. |
| 2 | Annual income of 200 smallholder farmers [80 former beeks all M, 60F new, 60M new] from beekeeping increases by average of GBP50 and 10kg of honey per beekeeper by end of project, against baseline. [100 are subset of IPM farmers, 100 additional]. | The Baseline Survey showed that existing beekeepers are earning, on average, £120 from honey selling. For them an increase of £50 each would result in a new average of £170 for existing beekeepers. For new beekeepers we assume their income from honey selling is 0 to start. | The Project Logic assumes that a reduction in pesticide application will be beneficial for honey bees and it will be possible to keep more colonies and colonies will be stronger.<br><br>We started working with new beekeepers in 2023 and it is too early for them to have harvested honey. However, our rapid random survey (April 2024) revealed average number of bee colonies kept to be 5 – which can potentially yield about £17 each or £85 each. This suggests that when honey selling starts we should reach our target with new beekeepers.<br><br>Our logic with existing beekeepers is that a reduction in pesticide use in the area will encourage them to scale up their beekeeping. This has not happened yet – possibly because a large reduction in pesticide use |

[5] Some preliminary results reported in Section 5 and Evidence 7 in Annex 5

| | | | |
|---|---|---|---|
| | | | has not yet occurred (see Outcome Indicator 1 above). Work in progress. |
| 3 | No. of honey bee colonies kept by smallholders in the project increased by 50% from the baseline, by end. | The Baseline Survey showed that existing beekeepers have on average 12 colonies each. To reach this target they would need to be keeping an average of 18 colonies each. For new beekeepers we assume that they have 0 colonies. We have not yet set a target for new beekeepers. We will do this as we engage with them in Year 2. We have not yet started working with new beekeepers.<br>To date there has been no change in colony numbers as a result of the Project. | New beekeepers have increased colony numbers from 0 to 5 (on average – rapid survey).<br>Existing beekeepers, no change – see above.<br>Work in progress. |
| 4 | Density of beneficial insects in farmers crops and margins shows an increase of at least 40% (change in natural enemies measured in diff. treatments throughout, change in pollinating insects measured by comparing pollinator counts at baseline (2022) in non-IPM farms and IPM plots in 2023 and 2024 | Density of beneficial insects is being measured in two ways. (1) In the IPM plots and in farmer-managed plots, for comparison. (2) Landscape level counting at six permanent sample sites.<br>Data collection for both (1) and (2) is on-going. | Natural enemy data for Year 1 IPM trails see Annex 5. These show strong trend for more natural enemies being founds in IPM plots.<br>Data for Year 2 IPM trials – not available yet – but see Evidence 7 in Annex 5.<br>Landscape-level counting was interrupted by the conflict and no counting has been done in Mecha. 116 records have been collected since project start. Not yet analysed – yet as large scale reduction in pesticide use has not yet happened – we may not yet expect to see a change.<br>Work in progress. |
| 5 | Increase, from 1 to 20, in no. of types of bees and other pollinating insects / insect groups which project participants can recognise in farms and margins (baseline = honey bee only). | At Baseline we learned that farmers recognise honey bees and know their role as honey producers, not pollinators. Farmers do recognise other insects, and are familiar with different types of crop pests. This indicator therefore is not so much about recognising insects – but recognising *which insects do what?* | At Baseline Survey 94% of 368 farmers said that honey bees were the only beneficial insects that they were aware of, and they believed that all insects, except honey bees, should be destroyed.<br>Our rapid survey (April 2024) 9/55 farmers (17%) said that there were many beneficial insects in addition to honey bees whilst 46/55 (83%) said that were a small number of types of |

| | | | |
|---|---|---|---|
| | | | beneficial insects. None said that honey bees were the only beneficial insects.<br><br>In the rapid survey (April 2024) 91% said that they think it is important to take steps to encourage Natural Enemies in their farms.<br><br>Work in progress. |

**Overall reflections.**

Overall we believe that project results are moving in the right direction, but not as fast or at the scale that we would have hoped. There are a number of challenging circumstances which can account for this:

- Bees for Development Ethiopia are not IPM 'experts' and are relying on other partner organisations to support them – which is good, but it can take time to leverage advice and expertise from others. For example, the fieldworkers struggled with the Year 1 grass pea IPM trials due to not having a protocol to follow.
- Farmers are very interested in reducing pesticide use but inevitably this immense change takes time, and many farmers are waiting for the 'early adopters' to go first.
- The prevailing institutional and policy environment i.e. government advice, is still leaning strongly towards chemical intensification. For example, one government stakeholder who attended the IPM/pesticide policy familiarisation workshop in early 2023 said, "but we still need to feed people" – belying his belief that yields with IPM are lower.
- The botanical pest control substances i.e. purchased Nimbecidine or home-made neem extract are hard to source for farmers. Neem is not readily available in the area.
- The highly significant and disrupting impact of the conflict in Amhara has made fieldwork very difficult.

As we look at our Outcome targets we perceive that we are unlikely to meet all of them by end of project. Yet the project logic remains sound. The unintended negative consequences of high chemical pesticide are widely perceived by farmers – in terms of their health, their budgets, their environment. The consequences of applying pesticides like profenofos and malathion on the flood plains of Lake Tana must be a great cause for concern in terms of impact on its unique and important biodiversity.

We reflect also about the origins of this project idea – this came from beekeepers who cited pesticides as a major cause of honey bee loss, with particular concern raised about the crop grass pea, in particular. Grass pea is sometimes dubbed 'the bee-killing crop' by beekeepers because it is both highly attractive to bees and much sprayed when in flower. And grass pea is very widely planted in Amhara – even beyond the irrigated vegetable zones where this project is focussed. It is for this reason that as we embark on Year 3 we need to consider the following:

1. How to make botanical pest control substances more readily available
2. Putt more effort into helping Farmer Field School farmers from Years 1 and 2, adopt IPM on their own farms
3. Put more effort into grass pea IPM methods and protocols.
4. Write up results and guidance into accessible knowledge products.

## 3.4 Monitoring of assumptions

All of the Outcome level assumptions still hold true.
**Assumption 1:** Unexpected and out-of-control pest infestations that lead to government-led pest control campaigns (e.g. aerial spraying).
Update: Still a valid assumption. This has not occurred.

**Assumption 2:** Increases in yields of vegetables, pulses and honey harvests will not lead to price reductions.
Update: No evidence has emerged to challenge this assumption.
**Assumption 3:** The Covid-19 global pandemic will not lead government to order complete closure of trainings and workshops, and interrupt market chains and marketing opportunities for vegetables, pulses and honey.
Update: A correct assumption and now out-of-date.
**Assumption 4:** Extreme weather hazard will not occur.
Update: This assumption still holds true.

We believe the Output level assumptions still stand.
**Assumption 1:** Women farmers are able to attend training sessions held at their local Farmer Training Centers and by making sessions to be half-day sessions it is more feasible for women to attend as they have many daily household chores.
Update: Women farmers have been able to attend training sessions as arranged.
**Assumption 2:** All training attendees, government workers and farmers will apply the new knowledge and share it with others.
Update: This assumption is key to the success of the project. To date application of new knowledge and sharing of new knowledge is occurring more slowly than we would like and we cannot assume that knowledge will be applied without further project interventions and support – needs to be factored in to the final year.
**Assumption 3:** Government extension workers will support the Project and work alongside Project staff to regularly follow-up the FFS and collect trial data.
Update: Government extension workers do support the project; their involvement has been factored in by design.
**Assumption 4:** Based on discussion we know some farmers are willing to allocate land to FFS trials and some are unable.
Update: We cannot assume that farmers are able to allocate land for FF-IPM trials – which is why we have made alternative arrangements.
**Assumption 5**: Participating in the FFS, for 1-2 hours each week, is time intensive and demands high commitment and we assume that all farmers make time to participate in FFS trials and to share the knowledge they gain from FFS to other farmers.
Update: Yes, this is a valid assumption – up to a point. There is need for constant engagement to maintain high participation rates.
**Assumption 6:** Beekeepers and non-beekeepers are able and committed to apply IPM and reduce pesticide application.
Update: Beekeepers and farmers tell us they are able and committed to apply IPM and reduce pesticide application, but we cannot assume that they will do so without further support – actions towards this end will be delivered in the final year of the project.
**Assumption 7:** The current high demand for honey persists.
Update: The assumption holds true.
**Assumption 8:** Government remains committed to co-hosting policy familiarization and analysis workshops and advocating and enforcing government policies, proclamations and regulations.
Update: Government offices and officers are demonstrating good commitment, but reaching decision-makers remains a challenge.

## 3.5 Impact: achievement of positive impact on biodiversity and poverty reduction

Impact: Agriculture in Ethiopia delivers multiple benefits for people, for biodiversity and for the environment, with maximum synergy between sustainable development and ecosystem service provision.

The focus of the project is on insects – especially natural enemies of crop pests and honey bees. These insects have a direct and tangible role to play in the success of sustainable agriculture. Protecting these insects from poisoning, by reducing use of chemical pesticides, forms the central aim of this project. These chemical pesticides are inevitably causing harm to many other groups of insects and fauna in the Lake Tana ecosystem.

Lake Tana is well known for its unique concentration of endemic fish species due to the lake's isolation from other water bodies separated by the Tis Issat falls. Approximately 70% of the 67 different fish species recorded in Lake Tana are endemic and the lake is home to the only remaining intact flock of Barbus fish in the world.

Lake Tana Biodiversity - NABU beyond borders

Wetlands are located all around the lake. Together they are the largest in the country and integral parts of the complex Tana-ecosystem. They consist of permanent swamps, seasonal swamps, and areas subjected to regular inundation. During the training period these wetlands are connected with the lake. They act as nurseries for most of the fish populations in the lake, and serve as breeding ground for water fowl and mammals. Around the lake and its catchment, including the town of Bahir Dar, live about 2 million people.

(3) (PDF) Lake Tana: Source of the Blue Nile (researchgate.net)

It is these same wetlands which are the focus of irrigation schemes for growing vegetables and it is these same wetlands which are currently subject to heavy pesticide use. Profenofos is widely applied to the crops included in this project's IPM trials yet is profiled as follows:

*Profenofos, an organophosphate group of non-systematic insecticides and acaricides, is used to combat aphids, cotton bollworms, tobacco budworms, beet armyworms, spider mites, and lygus bugs. It has become a significant environmental concern due to its widespread presence. It accumulates in various environmental components, contaminating food, water, and air. As a neurotoxic poison, it inhibits acetylcholinesterase receptor activity, leading to dizziness, paralysis, and pest death. It also affects other eukaryotes, such as pollinators, birds, mammals, and invertebrates, affecting ecosystem functioning.*

*Raj A, Kumar A, Khare PK. The looming threat of profenofos organophosphate and microbes in action for their sustainable degradation. Environ Sci Pollut Res Int. 2024 Feb;31(10):14367-14387. doi: 10.1007/s11356-024-32159-7. Epub 2024 Jan 30. PMID: 38291208.*

As mentioned above the Lake Tana environment is also home to 2 million people, most of whom are depending directly on natural resources – as farmers, beekeepers, fishermen. Excessive pollution and contamination can potentially lead to loss of key species and damage to ecosystem functioning which can have a direct impact on the success of people's livelihoods. More specifically overuse of pesticides can lead to loss of income through:

- Direct expenses associated with buying pesticides. As our IPM trials have shown the cost of pest management using chemical pesticides is 2-4 times greater than IPM alternatives.
- Loss of honey bees. Beekeepers can earn up to £100-200 a year from selling honey, and this important extra income can be used as 'free capital' to invest in other income-generating activities. Given that beekeeping requires less land, labour and capital than other farming activities it can be an incredibly empowering and accessible livelihood for **the most marginalised people**. Loss of this livelihood opportunity can increase vulnerability.

*Many studies have been conducted on the effects of pesticide use in bee colonies across Ethiopia, for example a study in the Ethiopian Central Rift Valley where pesticides are used intensively for small-scale horticultural production indicated that 48.3% of beekeepers abandoned beekeeping as a result of colony losses due to pesticide applications. Similarly, studies in other parts of Ethiopia, including the Enebse and Bure districts, the Dangila, Guangua and Mecha districts, the Gojjam zone of northwest Ethiopia, the Ejere District of western Ethiopia, and others reported a decreasing trend of honeybee populations and their products due indiscriminate pesticide application.*

*Negatu B, Dugassa S, Mekonnen Y. Environmental and Health Risks of Pesticide Use in Ethiopia. J Health Pollut. 2021 May 28;11(30):210601. doi: 10.5696/2156-9614-11.30.210601. PMID: 34267988; PMCID: PMC8276724.*

- Farmers' health can be negatively affected by exposure to pesticides – and those who are unwell cannot/or struggle to work. Families who experience ill-health of the economically productive adults – can quickly fall into poverty.

*Respiratory health is the most frequently studied occupational health effect of pesticide exposure in Ethiopia.*

*However, another relatively larger study that focused both on male pesticide applicators as well as female re-entry workers in commercial farming systems in Ethiopia (i.e., small-scale irrigated farms, large, scale open farms and cut-flower greenhouses) indicated significant exposure-response associations of occupational pesticide exposure with respiratory symptoms and reductions in lung function.*

*Negatu B, Dugassa S, Mekonnen Y. Environmental and Health Risks of Pesticide Use in Ethiopia. J Health Pollut. 2021 May 28;11(30):210601. doi: 10.5696/2156-9614-11.30.210601. PMID: 34267988; PMCID: PMC8276724.*

- Loss of pollination services can impact on crop yields, income and food security.

## 4. Project support to the Conventions, Treaties or Agreements

The Project is working in line with national plans, towards contributing to international commitments. In March 2023 the Project conducted one familiarization workshop focusing on international conventions, treaties and development goals; and national policies, proclamations and action plans. This workshop was attended by a representative of the Ethiopian Biodiversity Institute (EBI). EBI is the Ethiopian focal point for the Convention on Biological Diversity. The representative gave a presentation about Ethiopia's commitments to the CBD, which was well received by other participants who were previously ill-informed about CBD.

This Project has the potential to contribute towards achieving Ethiopia's commitment to 'Coalition of the willing on pollination', within the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), through reducing harm caused to pollinators by pesticide application. This Project contributes to SDG 1, 2 and 15 through supporting sustainable farm incomes from crops and beekeeping, through supporting the production of nutritious, high-quality foods and through reducing harm caused to insect biodiversity on farms. Dr. Tadesse Amera, Executive Director of PAN Ethiopia is Co-Chair of International Pollutants Elimination Network (IPEN) and has observer status at different chemical related conventions (Basel, Rotterdam, Stockholm, Minamata, SAICM, UNEA). He shares the objective, actions, results and learnings of this Project in international meetings and platforms.

## 5. Project support for multidimensional poverty reduction

The main target group of the Project are smallholder farmers (40% females) and government extension workers. Farmers in this part of Ethiopia are a highly disadvantaged group, and suffer deep poverty. The Baseline Survey revealed that 35% of men and 73% of women cannot read or write, a strong predictor of poverty. They rely on farming to survive, and it is essential that their farming system is sustainable and does not precipitate untenable environmental risks. This Project is helping to increase their income, and to safeguard the natural resource base and ecosystem functioning, on which they rely. The Project expects income to rise by halting the decline in beekeeping, a proven, valuable, livelihood addition. The results of the first analysed IPM trials (Evidence 6) showed that in some instances farming using IPM was more profitable, compared to normal practice, so it is possible that IPM will enable farmers to earn more from vegetable growing. The Year 2 results indicate the same, with an improvement in the grass pea also – see table below.

**Table showing economic analysis of grass pea farming using IPM v farmer normal practice (all amounts in Ethiopian Birr)**

| Kuhar Abo kebele Grass pea trails comparison of IPM vs FP plots per 0.25 ha Year 2 (23/24) | | |
|---|---|---|
| **Description** | **IPM Plot** | **FP Plot** |
| Grass pea Yield (Kg) | 250 | 266.67 |
| Price per Kg in ETB | 48 | 48.00 |
| Grass pea straw | 1750 | 1750 |
| **Total Sale in ETB(A)** | **13,750.00** | **14,550.00** |
| Pest and Disease management cost | 1,125.50 | 4,120.00 |
| Land rent and Seedling costs | 7,062.50 | 5,500.00 |
| Labour costs | 3,500.00 | 3,166.67 |
| **Total Production cost in ETB (B)** | **11,688.00** | **12,786.67** |
| **Net Sale (A-B)** | **2,062.00** | **1,763.33** |

## 6. Gender Equality and Social Inclusion (GESI)

| | |
|---|---|
| Please quantify the proportion of women on the Project Board[6]. | 50% |
| Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women[7]. | 50% |

| GESI Scale | Description | Put X where you think your project is on the scale |
|---|---|---|
| **Not yet sensitive** | The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach | |
| **Sensitive** | The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities. | |
| **Empowering** | The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups | X |
| **Transformative** | The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change | |

[6] A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

[7] Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

The project is endeavouring to reach women and give them information, knowledge and skills so they are not left out, and can contribute to decision-making about farming practices from an informed position. The project's success in this regard is evident by the fact that 42% of the 235 farmers engaged in the Farmer Field School in 2023/24 are women. This is in addition to the 34% of the 170 farmers engaged in FFS in Year 1. It also marks an in increase in engagement and we have reached our target of 40% women reached.

Our gender analysis (Year 1) revealed that in some households, men and women discuss and share ideas about how much fertilizer, seed and pesticide should be used in a production season – but this less likely to occur if men or women think that men are more knowledgeable, or have had more training, in which case decisions are largely taken by men. Men are more likely to consult their wives, if they know their wives have attended training. By deliberately setting a target of engaging at least 40% women in the FFS the project has been designed to empower women, and to increase the chance of them being involved in household decisions which are more normally dominated by men.

The gender analysis activity was designed, not only to reveal gender roles relevant to the project activities, but to be a participatory and transformative training event. This is evidenced by feedback from some of the participants (see below).

*I have been participated in other trainings. However, this gender analysis is new for me. From the gender analysis exercise discussion and result I understand that women are contributing more in some of farming practices than males and equally in most of the activities. The exercise showed me that women have to equally participate in every discussion at household and community level.*

(Yeshiemebet Lake, Kudmi Kebele, North-Mecha district).

*Previously, I did not attend gender analysis group work. From the gender analysis exercise, I understand that women have equal understanding about the farming practices, and women and males should discuss and made decisions together with consensus. More farmers have to get this opportunity to attend the gender analysis exercise. Both the husband and wife have to participate in the gender analysis rather than simply forming separate groups for men and women.*

(Tilaye Kebede, Kudmi Kebele, North-Mecha district).

The project is reaching both male and female Development Agents – and the proportions reached has ranged from 25% to 45%. However, this is determined by the number of women who are employed in these roles and the project has no impact on that.

In the beekeeping activities the project is working with existing beekeepers and people who have never kept bees before. Most of the existing beekeepers in the project location were men (as determined by existing gender norms) and 18% of the existing beekeepers being supported by the project are women. In order to re-dress this gender imbalance we purposively pushed up the

proportion of women being trained as new beekeepers – and reached 30%. It is expected that by giving more women the chance to own bees, have beekeeping skills, and become successful and independent beekeepers – this will serve to increasing equal access to assets, resources and capabilities for women.

Interestingly, men are very much concerned for womens' health regarding the effect of pesticides on giving birth, the unborn child and fertility and they do not let females to participate in pesticide spray.

## 7. Monitoring and evaluation

Most of the project monitoring depends on field work and this has been particularly challenging this year due to the state of emergency and insecurity situation in Amhara – which started in August 2023. However, the field workers have done the best they can and have managed to liaise with government officials to continue to do their work as well as possible.

Our M&E plan remains the same as reported last year and we are collecting data during Farmer Field School, through analysis of results of the IPM plots, and through engagement and interviews with farmers and Development Agents. We conducted a rapid Annual Data Collection Activity in April 2024 – and interviewed the following people:

Farmer Field School participants from Year 1 = 35

Farmer Field School participants from Year 2 = 20

Existing beekeepers, now supported by project = 10

New beekeepers, now supported by project = 9

Development Agents = 10

Farmer interviews, using a questionnaire, is a good approach as it allows us to make quantitative measures of progress and compare with baseline survey. It is however quite a blunt instrument and does not provide much in the way of nuanced understanding or to-and-fro discussion. Plus it is time-consuming to reach a large number of farmers – yet a small sample might not be representative.

The questionnaire results in April 2024 revealed that IPM adoption by Year 1 cohort was low. This caused us to go back and discuss the results with the fieldworkers who were able to explain and elaborate, and report on actions of farmers who were not included in the random sample. This suggests that as we move into the final year of the project we need to broaden our approach to M&E to include more participatory Focus Group Discussions and long-format interviews.

M&E is shared by all partners, but the bulk of the role falls to Bees for Development Ethiopia. Information is shared by email and on our Bees for Development sharepoint site. We hold review meetings with partners online, using Teams, on a regular basis. When PAN-E travel to Bahir Dar for a specific activity, this affords an opportunity for a project review meeting.

How can we demonstrate that the Outputs and Activities actually contribute to the Project Outcome? This is achieved through triangulation of different sources of evidence and information. We know that, should we achieve our aim of reducing pesticide use in the area, this is highly likely to be attributable to Project Outputs and Activities because the general trend is the opposite and there are almost no other influences reaching farmers, promoting IPM. Strong evidence comes from the farmers themselves. Those less directly engaged in the FFS remain suspicious about the effectiveness of IPM. Should we achieve our aim of reversing the current downward trend of beekeeping we will be able to ask beekeepers about the factors which led them to adopt beekeeping or increase their colony numbers. An increase in density of beneficial insects in crops subject to less frequent spraying is highly likely to be related to this factor. An increase in density of beneficial insects in our landscape-level sample plots, may or may not be detectable within the time-frame of the Project. If achieved this is likely to be attributable to the Project intervention because this is contrary to the prevailing trend. However, we will remain mindful of other possible causes such as local changes in land use, habitat richness and explore these.

## 8. Lessons learnt

Grass Pea IPM Protocol

In Year 1 we did not have a protocol established for grass pea, there was no Ethiopian standard to follow and none of our partners had applied IPM to grass pea before. This meant that we faced challenges in assessing our Year 1 IPM trials. This Year we pooled experience and expertise, relied strongly on our partners and set aside more time to draft, discuss and refine a protocol for grass pea. We knew that even with the protocol we would need to pay attention to any issues / difficulties and refine as we went along. This was done. Accordingly the Grass Pea Protocol with field guidance (see Annex 5) will be refined further by reducing the number of sampling points, re-considering the utility of sweep netting, deciding whether a ratio of 1:10 (NE to pest) or 1:15 is the most appropriate ratio to use to inform decisions about treatments and standardising the use of a scale to record extent of damage to vegetation. In 2024 we will refine the Grass Pea Protocol with field guidance – ahead of the 24/25 season.

See Evidence 2.

Access to irrigation water was a problem for the onion IPM trails in 23/24. Irrigation water is released and directed according to a programme – but the trial plots were not well served. In 2024/25 we need to arrange special provision with the irrigation committee in each kebele before the irrigation period gets underway.

The main problem this year was the insecurity and civil unrest (see Section 11) which meant we were unable to do any work in Mecha. As the situation is now improving we need to plan well in advance to revise our plans and decide how many FFS we can deliver in Mecha in 24/25. Despite this problem, the project is progressing well and the feedback from farmers about the project is promising.

Based on farmers' reflection and our own lessons learnt the following activities need special attention in the final year of the project:

1. Activity implementation plans for 2024/25 in Mecha district should be made as soon as possible.
2. The by-laws of IPM-FFS should be revised and strengthened, to ensure consistent attendance of learner farmers.
3. Project staff need to insist that men bring their wives to the farmer-to-farmer shared learning days, where project results are demonstrated. Too often these events are made-dominated, with few women attending.
4. A neem seedling nursery should be established in the project area or a sustainable source of neem seed should be secured.
5. The Grass Pea IPM data collection protocol should be revised considering the experience of the field workers and farmers.
6. Agreements should be made with irrigation management committee ahead of the irrigation period

## 9. Actions taken in response to previous reviews (if applicable)

Taken from previous review feedback.

## 2. Comments and queries for project Leader

| No. | Comment | Discuss with BCFs Admin | Next half year report | Next Annual Report | No response needed |
|---|---|---|---|---|---|
| 1 | During this reporting period, the project has become aware that some indicators are not robust enough. Specifically, the project cannot robustly measure the impact of its training activities i.e. measuring knowledge. The project will be applying further thought to its M&E approach and it is encouraged to test the knowledge of individuals trained by the project both through questionnaires and in-field observation. | | | x | |

We have taken the feedback on board. We remain aware that assessing knowledge and understanding is very important and we are doing this through questionnaire survey and in-field observation. Unfortunately, the conflict and insecurity in the area has curtailed fieldwork and made it a lot harder for the fieldworkers to spend time close to the farmers.

We carried out an Annual Survey in April 2023 and another in April 2024. See Evidence 1.

We asked 16 knowledge and understanding questions (several with multiple answers).

As we embark upon the final year we will endeavour to hold more in-depth interviews and Focus Group Discussions to allow deeper probing about understanding and to ask reasons for doing things/not doing things. We will profile farmers as early adopters, early majority, late majority and 'laggards' and identify the barriers and motivators facing each group – and tailor our interventions accordingly.

## 10. Risk Management

This year one of the identified risks i.e. civil unrest and conflict, in project area, materialised to the detriment of Bees for Development Ethiopia's ability to work safely. This curtailed some work and necessitated a Change Request which was submitted and accepted in late 2023.

Please see updated risk matrix.

## 10. Sustainability and legacy

Following on from the promotional work done in Year 1, we have continued to share project results towards achieving buy-in from government.

In March 2024 a field visit was arranged for key stakeholders to visit the FFS-IPM trials in Kuar Michael kebele. The learning and sharing event was attended by government administrators, agriculture and livestock office heads, development agents and farmers. Participants clearly observed that the IPM plot was performing as well as the normal-practice farmer plot – even without the heavy application of pesticides. Government officials acknowledged their interest to take the project IPM experience to other villages and districts. Meanwhile farmers are saying that they are ready to adopt IPM in their own farms. They are however requesting the Project to supply neem seed – both to use as a botanical treatment and also to plant as a tree to provide neem in the future.

In January, 2024 the project midterm evaluation was carried out at regional level by the relevant government offices. This evaluation shared project progress with 4 government departments, in accordance with Ethiopian government regulations which govern all NGO projects. Achievements and challenges were shared and discussed with stakeholders. One feedback comment was made by Ato Habtamu from Bureau of Agriculture, ''*I would say congratulations to the project staff for their success. As per the report and as we confirmed at field level most of the farmers who have participated in the project have built a good understanding about IPM. Understanding by itself is not an end goal and farmers should adopt*

*the technology and practice in their own farms and the project should focus on the adoption of the technology in the next season".*

Farmers' knowledge and interest in IPM and their understanding of the relationship between natural enemies and pests has grown as a result of the project and this understanding is likely to persist. For example, at baseline 60% of interviewed farmers (369) said 'Yes' to the question *"Do you think it is important to try and destroy all the insects you see in the vegetable field?",* whilst during the data collection activity in April 2024, 25% of interviewed farmers (55) gave this answer[8].

Notwithstanding the progress made, the very strong interest from government officials and from farmers, and the promising trial results which demonstrate the efficacy of IPM – it must be acknowledged that there is still a great deal of work to be done to consolidate and establish IPM as normal farmer practice. This is still work in progress. Shifting government policy and approach away from chemical intensification, towards more agroecological methods, has not yet happened. Translating expressions of interest from government representatives, into government policy is unlikely to occur within project lifetime.

As a result of the project and the engagement of Dr. Adane from Bahir Dar University, some students have been influenced in their selection of research topics. As follows:

1. Management of tomato leaf miner (Tuta absoluta Meyrick) on tomato (Solanum lycopersicum) using botanical extract, synthetic insecticide and their integration in fogera, northwestern Ethiopia by **Lemat Teshome**
2. Integrated Pest Management of Onion Thrips on Onion, Mecha District, Ethiopia by **Etagegn Mulu** (Already published).
3. Seasonal population dynamics of White Mango Scale (Aulacaspis tubercularis) at different agro ecologies in West Gojam Administrative Zone, Bahir Dar and North Mecha Districts of Amhara Region, Ethiopia by **Birhanu Yeshwas**.

Although the project did not support the students with budget, they conducted their research in the project woredas due to the influence of the project.

## 11. Darwin Initiative identity

The Darwin Initiative logo has been well promoted in banners, newsletters, training materials, and presentation slides during Project launching programme, training sessions, policy familiarization events, and field visit activities.

In Ethiopia, all projects delivered by NGOs must be approved and monitored by all relevant government departments i.e. those administratively in charge of the project location and those in charge of related sectors. This immediately presents an opportunity for Darwin Initiative and this funded project to be strongly recognised. Bureau of Finance and Economic Cooperation, Bureau of Agriculture, Livestock and Fishery Resource Development Office, and Environment and Forest Protection Authority at all levels (region to kebele) recognise Darwin Initiative as a distinct UK based funding programme.

Through this project Darwin Initiative is also highly recognized by federal institutes like Bahir Dar University, and The Ethiopian Biodiversity Institute.

Promotion of project activities and achievements via social media was strongly curtailed in 2023 as Amhara was subject to a complete internet shutdown for 4 months, due to the State of Emergency declared in August.

Bees for Development UK has promoted the project by sharing news within its monthly newsletters to supporters and subscribers. This reaches 17,000 people each month.

Social media posts

[8] Still too many!

https://www.instagram.com/p/C4qWFN4K0Su/?img_index=1

## 12. Safeguarding

| | |
|---|---|
| Has your Safeguarding Policy been updated in the past 12 months? | Yes |
| Have any concerns been reported in the past 12 months | No |
| Does your project have a Safeguarding focal point? | Yes<br>In UK – Janet [redacted]<br>In Ethiopia - Getsh [redacted] |
| Has the focal point attended any formal training in the last 12 months? | Yes, in Ethiopia.<br>Getsh [redacted], in Ethiopia has attended a safeguarding training organized by Mastercard Foundation in January 2024, following new project award by the Foundation. |
| What proportion (and number) of project staff have received formal training on Safeguarding? | Past: 75% [6]<br>Planned: 25% [2] [new staff]<br><br>Refresher, training has been given to Ethiopian staff, 6 project staff |
| Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.<br><br>None | |
| Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.<br><br>Yearly refresher training on safeguarding will be given to all project staff in Ethiopia. | |
| Please describe any community sensitisation that has taken place over the past 12 months; include topics covered and number of participants.<br>During the training sessions of this reporting period, BfDE sensitised more than 230 project beneficiaries about safeguarding issues and BfDE updated their local community based safeguarding reporting mechanisms, for any safeguarding issue/case which may emerge. | |
| Have there been any concerns around Health, Safety and Security of your project over the past year? If yes, please outline how this was resolved.<br><br>Yes, there is an ongoing security problem in one of our intervention district (North Mecha). To ensure the safety and wellbeing of staff of Bees for Development Ethiopia we revised our work plan and in this season we worked only in Fogera woreda.<br>Staff of Bees for Development Ethiopia have followed all local government and police advice about how to stay safe. | |

## 13. Project expenditure

All figures are draft. Not final.

**Table 1: Project expenditure during the reporting period (1 April 2023 – 31 March 2024)**

| Project spend (indicative) since last Annual Report | 2023/24 Grant | 2023/24 | Variance % | Comments (please explain |
|---|---|---|---|---|

| | (£) | Total Darwin Costs (£) | | significant variances) |
|---|---|---|---|---|
| Staff costs (see below) | [redacted] | | | |
| Consultancy costs | | | | |
| Overhead Costs | | | | |
| Travel and subsistence | | | | |
| Operating Costs | | | | |
| Capital items (see below) | | | | |
| Others (see below) | | | | |
| **TOTAL** | **£96,112** | **£96,148** | | |

A Change Request was approved in November 2023. These figures shown above refer to the approved changed grant amount for 23/24.

**Table 2: Project mobilised or matched funding during the reporting period (1 April 2023 – 31 March 2024)**

| | Secured to date | Expected by end of project | Sources |
|---|---|---|---|
| Matched funding leveraged by the partners to deliver the project (£) | [redacted] | | Bees for Development unrestricted funds<br>Bees for Development Ethiopia unrestricted funds |
| Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£) | | | |

## 11. Other comments on progress not covered elsewhere

We faced a significant challenge this year – insecurity and unrest broke out in Amhara in August 2024 leading to a State of Emergency being declared in region.

Declaration of this State of Emergency has posed numerous challenges for us in connection with 2023 – 2024 programme delivery, especially because of internet restrictions and blockages of main roads to the project area. After some months we were able to get special permission via a privilege given to NGOs operating in Amhara region including permission to have open internet access and to conduct meetings with a high number of participants - despite the meeting ban. The political environment is now much calmer than last year. Yet there is still unpredictable security in Mecha woreda. In Fogera the situation is stable and all project works are going well. Our main strategy is to conduct a quick security assessment using our strong network with the local government and social network with the community, including our beneficiaries, prior to field work.

## 12. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes.

I agree for the Biodiversity Challenge Funds to edit and use the following for various promotional purposes (please leave this line in to indicate your agreement to use any material you provide here).

| File Type (Image / Video / Graphic) | File Name or File Location | Caption including description, country and credit | Social media accounts and websites to be tagged (leave blank if none) | Consent of subjects received (delete as necessary) |
|---|---|---|---|---|
| JPEG | Attached as More Bees 1 and 2<br><br>Learning day in Enguti and onion IPM trial | "First of all, I would like to thank the professionals who worked hard for this work. It is known that the district is highly affected due to pesticides. I believe that the onion product that we visited today is very encouraging and the right way to teach farmers in practice. It would be good if you have such a demonstration on other types of vegetable crops. Finally, I call on the district to do its part so that this activity can be implemented in every farmer's field".<br>Abiyot Biru, Manager of Koga Irrigation Scheme<br>Ethiopia<br>Bees for Development Ethiopia | Bees for Development \| Monmouth \| Facebook<br><br>Bees for Development (@beesfordevelopment) • Instagram photos and videos<br><br>**X** @beesfordev | Yes |
| JPEG | Attached as More Bees 3 and 4<br><br>Learning day in Enguti and onion IPM trial | "I followed the whole onion production process. I never expected this product to be available. But now I proved in practice that it is possible to produce without chemicals and I can be a witness to others".<br>Babey Babel, farmer from Enguti Kebele.<br>Ethiopia<br>Bees for Development Ethiopia | as above | Yes |

## Annex 1: Report of progress and achievements against logframe for Financial Year 2023-2024

| Project summary | Progress and Achievements April 2023 - March 2024 | Actions required/planned for next period |
|---|---|---|
| ***Impact***<br><br>Agriculture in Ethiopia delivers multiple benefits for people, for biodiversity and for the environment, with maximum synergy between sustainable development and ecosystem service provision. | Project is making steps towards reducing harm caused to insect biodiversity as a result of heavy and highly-toxis pesticide use.<br><br>Project is making steps towards increasing farmer income through support for beekeeping enterprises, which thrive better when pesticide use is reduced. | [redacted] |
| ***Outcome*** Adoption of integrated pest management in 2 sites in Amhara, leading to restoration of beekeeping livelihoods, increased abundance of beneficial insects, and more income for smallholders. | | |
| Outcome indicator 0.1<br><br>900 smallholder farmers [40% F = 360 F] adopt IPM practices, and reduce frequency of application of pesticides on irrigated vegetables and pulses grown with residual moisture, by end of project. Target is to cut frequency by at least half, against baseline, by end of project. | Good indicator – but too ambitious. Yes we can achieve a cut in frequency of pesticide application – but unlikely to be achieved by 900 farmers. To date adoption of IPM is limited.<br><br>Work in progress. | Targeted support to help Farmer Field School participants to overcome concerns and barriers to applying what they have learned about IPM, on their own farms. |
| Outcome indicator 0.2<br><br>Annual income of 200 smallholder farmers [80 former beeks all M, 60F new, 60M new] from beekeeping increases by average of GBP50 and 10kg of honey per beekeeper by end of project, against baseline. [100 are subset of IPM farmers, 100 additional] | Good indicator. New beekeepers are likely to achieve target when they start selling, but existing beekeepers may not achieve substantial increase on their baseline.<br><br>Work in progress. | Refresher training will be given to all beekeepers about honey harvesting to maintain quality and marketing. |
| Outcome indicator 0.3<br><br>No. of honey bee colonies kept by smallholders in the project increased by 50% from the baseline, by end. | Good indicator. New beekeepers are likely to achieve target because they started from zero, but existing beekeepers may not achieve substantial increase on their baseline.<br><br>Work in progress. | Training will be given to all beekeepers about colony multiplication. |
| Outcome indicator 0.4<br><br>Density of beneficial insects in farmers crops and margins shows an increase of at least 40% (change in natural enemies measured in diff. treatments throughout, change in pollinating insects measured by comparing pollinator counts at baseline (2022) in non-IPM farms and IPM plots in 2023 and 2024. | Good indicator. Density of beneficial insects in PM plots shows increase of 40%. Challenge is to cascade this increase to farmers plots (see Outcome indicator 0.1 above) | Year 3 FFS-IPM trials will be delivered and insect counts and farm-level and landscape-level will be done.<br><br>Also see above – effort to help farmers adopt IPM will lead to more beneficial insects on their farms. |

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| Outcome indicator 0.5<br><br>Increase, from 1 to 20, in no. of types of bees and other pollinating insects / insect groups which project participants can recognise in farms and margins (baseline = honey bee only). | Indicator could be improved. Project participants have a growing appreciation of the importance and role of beneficial insects. Probably less important to count the types of bees farmers can identify – more important that they can recognise beneficial insects and their role. Good progress on this. | Insect ID guide widely shared.<br><br>Year 3 IPM trials implemented. |
| **Output 1** Smallholder farmers and government extension workers in Fogera and Mecha have a good working understanding of their local agro-ecosystem. | | |
| Output indicator 1.1 & 1.2 50 36 Govt. extension workers gain knowledge about harmful impact of pesticides and role of beneficial insects in 22/23, and about pollination and sustainable agriculture in 23/24, 3 training days/year, with 10 Govt. extension workers from North Mecha moved to 24/25 | Good progress. Target was 36 and we reached 47 in Year 1 and those in Fogera received more training in Year 2.<br><br>Development Agents have good knowledge and understanding as assessed by rapid knowledge survey in April 23. See Section 3.2 | DAs in Mecha will receive further training in this coming year. |
| Output indicator 1.3<br><br>30 lead, 90 follower farmers [40% F] understand local agro-ecosystem, pollination, beneficial insects and harm caused by pesticides, by attending 4 ½ day sessions [24 in 22/23, 32 in 23/24, 64 in 24/25]. | Good progress. We trained all farmers, not just lead farmers. 235 trained in Year 2.<br><br>Improvement in knowledge and understanding is good – reported in Section 3.2. | Will reach new farmers in Mecha and further kebele in Fogera, in this coming year. |
| Output indicator 1.4<br><br>44 Government extension workers, 120 smallholder farmers gain knowledge and understanding about their agro-ecosystem through 1-day ecosystem walks [32 in 22/23, 44 in 23/24 and 88 in 24/25] | No agro-ecosystem walk was done in 23/24, due to insecurity situation. | This will be done for extension workers and group of farmers in the coming year |
| Output indicator 1.5<br><br>Pollinator observers (extension workers, staff and farmers) [15M,15F] know how to recognise and describe groups of bees / other pollinators – and able to tell and guide others by June 2023. | Achieved in Year 1, no further in Year 2. | |
| Output indicator 1.6<br><br>List or ID guide of common bees / pollinators / natural enemy groups important in the project area compiled with easy-to-follow descriptors by June 2023. | Achieved in Year 1, no further in Year 2. However we are considering updating and expanding the guide as a poster. | Planning to make the guide into a poster. |
| Output indicator 1.7<br><br>Knowledge of change in density of bees / natural enemies [NE] / other pollinators in Project area through tally counting of NE in IPM plots throughout IPM trials and comparing with non-IPM plots and by conducting pollinator counts in non-IPM plots at baseline | Good progress. 240 FFS farmers conducted NE and pest counts in eight IPM trail plots in Year 2.<br><br>Landscape level pollinator monitoring is still on-going in Fogera (not in Mecha due to insecurity) – although with some interruptions. Data not yet analysed. | Planning to monitor insects in 24/25 IPM trials.<br><br>Will continue pollinator monitoring and will analyse. |

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| (2022), and thereafter in IPM plots and non-IPM plots in 2023 and 2024 | | |
| **Output 2.** Integrated pest management approaches adopted by smallholders in Fogera and Mecha. | | |
| Output indicator 2.1.<br><br>45 Government extension workers know the basics of IPM what it is, why important, how to do it and learn of examples from Ethiopia through 5 day training in 22/23 [25 in 22/23 and 10 in 23/24 and 10 in 24/25 | 26 in Year 1 and 10 in Year 2 = 36.<br><br>Good progress and good evidence of learning achieved. See Section 3.2 | Development Agents in Mecha will receive training in the coming year. They could not participate in 23/24 due to insecurity. |
| Output indicator 2.2.<br><br>120 farmers [40% F] know basics of IPM; what it is, why important, how to do it and learn of examples from Ethiopia through 3 day training [24 in 22/23, 32 in 23/24 and 64 in 24/25] | 172 farmers in Year 1 and 236 in Year 2. Exceeded target because we abandoned the learner/follower model and trained all.<br><br>Good progress and good evidence of learning achieved. See Section 3.2 | Cohort of Year 3 farmers in Mecha and Fogera will receive IPM training in 2024. |
| Output indicator 2.3<br><br>Appropriate IPM measures tested by farmers, in Fogera and Mecha, for vegetables and pulses, through 30 Farmer Field Schools (FFS) and IPM trials [6 FFS set up in 22/23, 8 in 23/24 and 16 in 24/25] | Target (changed target) was 8 FFS and IPM trials set-up in Year 2. This was achieved – 4 onion and 4 grass pea.<br><br>Good progress. Analysis not yet done. | Farmer Field Schools and IPM trials will be set-up in Fogera and Mecha in 2024.<br><br>We may re-consider the number as we wish to put more effort into achieving adoption, as opposed to demonstrating what is possible (as we have done that already, up to a point). This is currently under review. |
| Output indicator 2.4.<br><br>900 FFS farmers [360 F, 540 M] gain skills and knowledge in IPM so they can apply proven measures in their farms and teach others. 180 in 22/23, 240 in 23/24 and 480 in 24/45. | 172 farmers in Year 1 and 236 in Year 2 have been engaged in FFS to date. We have not been able to assess the extent to which skills and knowledge are being passed from FFS participant farmers to others in the community. | See above. In addition to those engaged in the FFS in 24/25 we wish to put more effort into achieving adoption and assessing uptake by farmers who are not directly engaged in FFS. |
| Output indicator 2.5<br><br>240 farmers learn results of IPM trials through field visits, together with 34 govt. staff each year. [80 different farmers each year] | This was achieved in this reporting period in March 2024. See Section 3.2 for evidence. | Field visit will be done – probably in February 2025. |
| Output indicator 2.6 | Not done. | Workshop will be done in 2024 – before August. |

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| 120 farmers [40% F] learn results of IPM trials in workshop, together with 34 govt. staff each year [40 different farmers each year] | | |
| **Output 3. Beekeeping enterprises established and re-established by smallholder farmers.** | | |
| Output indicator 3.1<br>44 Government extension workers have skills and knowledge in advanced sustainable beekeeping by end 23/24. | No update on Year 1 report. Achieved in Year 1. | No further training planned in Year 3 |
| 3.2 120 new beekeepers [at least 60F] know how to make hives, procure bees, establish apiaries, 60 in 22/23 and 60 in 23/24. [change this to 120 in 23/24] | 114 new beekeepers trained and achieved satisfactory skills – see Section 3.2 | No further training planned for Year 3. |
| 3.3 80 former/declining beekeepers [almost all former are men] gain skills and knowledge in bee colony multiplication and top-bar beekeeping by end of 23/24 [change this to 22/23] | Achieved in Year 1. | Those who need refresher training in colony multiplication will be assisted |
| 3.4 200 *** beekeeper [total of those above] know how to boost forage availability for honey bees, enrich habitat and protect colonies from pesticides [60 in 22/23, 140 in 23/24]. | Achieved for 78 former/declining beekeepers in Year 1.<br>Not yet achieved for new beekeepers. | Further training planned for new beekeepers in Fogera and Mecha in year 3 |
| 3.5 200 [80 former, 120 new] beekeepers start or re-establish beekeeping with small input provision from project and engage in profitable beekeeping at household level [60 in 22/23, 140 in 23/24] Change to 200 in 23/24 | Input provision was given to 78 former/declining beekeepers and 114 new beekeepers – according to their needs, as appropriate | No further inputs will be provided. |
| 3.6 200 smallholder farmers [at least 60 F] know how to get the best price for their honey by end of 24/25 | Not done yet. | Further training planned for Year 3 |
| Output 4<br>Farmers, government extension workers and other stakeholders have good understanding about instruments and guidelines to support biodiversity-friendly agriculture. | | |
| Output indicator 4.1<br>56 46 key stakeholder organization heads, directorates and experts have good knowledge about CBD, government policies, proclamations and regulations on biodiversity conservation, pesticide use, managing pollinators and sustainable agriculture by end 22/23. | Completed in Year 1 | No further |
| 4.2 Analysis of gaps and strengths of government policies, proclamations and regulations in relation to 4.1 undertaken by 56 | Not done. Output 1, 2 and 3 took priority. The conflict and office closure meant we lost 4 months of the year. | Workshop will be held in Year 3 |

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| key stakeholder organization heads, directorates and experts in 3-day policy analysis workshop by end 23/24. | | |
| 4.3 Information booklet about pollinators, natural enemies of crop pests and impact of pesticides on the agro-ecosystem in Amhara published and used by key stakeholders in 23/24. [2,000 hard copies distributed, e-copies also available on partners' websites]. | Not done. Output 1, 2 and 3 took priority. The conflict and office closure meant we lost 4 months of the year. | Booklet will be written in Year 3 |
| 4.4 500 IPM and beekeeping newsletters published twice each year and read by key stakeholders [500 x 2 x 3 = 3000, e-copies also available on partners' websites] | One newsletter was written and widely shared in August 2023. Internet shutdown halted communications making it hard to produce second newsletter. | Newsletters will be written and shared. |

## Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed)

| Project Summary | SMART Indicators | Means of Verification | Important Assumptions |
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| **Impact:** Agriculture in Ethiopia delivers multiple benefits for people, for biodiversity and for the environment, with maximum synergy between sustainable development and ecosystem service provision. | | | |
| **Outcome:** Adoption of integrated pest management in 2 sites in Amhara, leading to restoration of beekeeping livelihoods, increased abundance of beneficial insects, and more income for smallholders. | 0.1 900 smallholder farmers [40% F = 360 F] adopt IPM practices, and reduce frequency of application of pesticides on irrigated vegetables and pulses grown with residual moisture, by end of project. Target is to cut frequency by at least half, against baseline, by end of project.<br><br>0.2 Annual income of 200 smallholder farmers [80 former beeks all M, 60F new, 60M new] from beekeeping increases by average of GBP50 and 10kg of honey per beekeeper by end of project, against baseline. [100 are subset of IPM farmers, 100 additional]<br><br>0.3 No. of honey bee colonies kept by smallholders in the project increased by 50% from the baseline, by end.<br><br>0.4 Density[9] of beneficial insects in farmers crops and margins shows an increase of at least 40% (change in natural enemies measured in diff. treatments throughout, change in pollinating insects measured by comparing pollinator counts at baseline (2022) in non-IPM farms and IPM plots in 2023 and 2024.<br><br>0.5 Increase, from 1 to 20, in no. of types of bees and other pollinating insects / insect groups which project participants can recognise in farms and margins (baseline = honey bee only). | 0.1a Farmer interviews about IPM, farm visits, reports on crop protection practices, gender disaggregated<br>0.1b Farmer interviews, asking about the type of pesticides used, and frequency of application, at start and end of project.<br><br>0.2 Annual gender disaggregated beekeeper survey- measuring income from beekeeping of project beneficiaries<br><br>0.3 Annual gender disaggregated beekeeper survey- measuring number of honey bee colonies maintained by farmers.<br><br>0.4 Assessment of beneficial insects (natural enemies and pollinating insects) in project area, using tally of count of NE within sample plots against developed list of beneficial insect groups in IPM plots, in field margins and non-IPM plots in 22/23, 23/24, 24/25 and counting pollinators in non-IPM farms in 2022 (baseline) and in non-IPM farms and IPM plots annually thereafter.<br><br>0.5a Reports of field activities teaching participants insect observation skills and how to recognise pollinators, 22/23<br>0.5b End of project in-field evaluation with farmers, and other stakeholders. | Assume unexpected and out-of-control pest infestations that lead to government-led pest control campaigns (e.g. aerial spraying) do not happen.<br><br>Assume that increases in yields of vegetables, pulses and honey harvests will not lead to price reductions –so that<br>yield increases will lead to income increases for farmers.<br><br>We assume that the Covid-19 global pandemic will not lead government to order complete closure of trainings and workshops, and interrupt market chains and marketing opportunities for vegetables, pulses and honey. PAN-Ethiopia continued FFS work in 2020 using smaller groups and honey selling has continued through 2020/21.<br><br>We assume that extreme weather<br>hazard will not occur. |

[9] For natdural enemies (NE) we measure number per metre in length through plot, for bees and other pollinators we measure number per square metre.

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| **Outputs:**<br>**1. Smallholder farmers and government extension workers in Fogera and Mecha have a good working understanding of their local agro-ecosystem.**<br>Specifically, they will be (i) able to identify specific pollinators, natural enemies [NE] and crop pests and know their lifecycles and understand their roles in the agro-ecosystem (natural enemies and pollination) (ii) appreciate how misuse of pesticides can interrupt beneficial processes within their agro-ecosystem leading to pesticide resistance, pest replacement and resurgence and pollination deficits (iii) perceive that their agro-ecosystem is a whole system and can be nurtured to increase the sum of benefits. | 1.1 & 1.2 ~~50~~ 36 Govt. extension workers[10] gain knowledge about harmful impact of pesticides and role of beneficial insects in 22/23, and about pollination and sustainable agriculture in 23/24, 3 training days/year, with 10 Govt. extension workers from North Mecha moved to 24/25<br><br>1.3 30 lead, 90 follower farmers[11] [40% F] understand local agro-ecosystem, pollination, beneficial insects and harm caused by pesticides, by attending 4 ½ day sessions [24 in 22/23, 32 in 23/24, 64 in 24/25].<br><br>1.4 44 Government extension workers, 120 smallholder farmers gain knowledge and understanding about their agro-ecosystem through 1-day ecosystem walks [32 in 22/23, 44 in 23/24 and 88 in 24/25]<br><br>1.5 Pollinator observers (extension workers, staff and farmers) [15M,15F] know how to recognise and describe groups of bees / other pollinators – and able to tell and guide others by June 2023.<br><br>1.6 List or ID guide of common bees / pollinators / natural enemy groups important in the project area compiled with easy-to-follow descriptors by June 2023.<br><br>1.7 Knowledge of change in density of bees / natural enemies [NE] / other pollinators in Project area through tally counting of NE in IPM plots throughout IPM trials and comparing with non-IPM plots and by conducting pollinator counts in non-IPM plots at baseline (2022), and thereafter in IPM plots and non-IPM plots in 2023 and 2024 | 1.1 & 1.2a Evidence of new knowledge, through interviewing sample of women and men attendees 6 months after training – asking how they have put their learning into practice by using a checklist (to be developed) covering practices, confidence and messages conveyed to farmers.<br>1.1 & 1.2b Attendance registers.<br><br>1.3a Evidence of new knowledge, gained by interviewing sample of women and men attendees 6 months after each training – asking how they have put learning into practice by using a checklist (to be developed) covering practices, confidence and likelihood of telling others.<br>1.3b Training attendance registers.<br><br>1.4a Evidence of knowledge of local agro-ecosystem shown through interviewing a sample of women and men participants 6 months after ecosystem walks in 22/23, 23/24 and 24/25. 1.4b Ecosystem walk participant attendance registers.<br><br>1.5 Reports compiled after ***Learning About Pollinators*** field days, with testimonials from pollinator observers.<br><br>1.6 Guide to common bees / pollinators / groups with easy-to-follow descriptors, local names and photographs where possible produced in hard and soft copy.<br><br>1.7 Bees / NE / and pollinator count results. | We assume that women farmers are able to attend training sessions held at their local Farmer Training Centers and by making sessions to be half-day sessions it is more feasible for women to attend as they have many daily household chores.<br><br>We assume that all attendees, government workers and farmers will apply the new knowledge and share it with others. |

[10] Two levels – Experts [6] and Development Agents [44], from livestock and crop departments. Same applies throughout where see number 50 or 44.

[11] 900 farmers participate in Farmer Field Schools, and a sub-set of the 900 receive more intensive training – namely 30 lead and 90 followers = 120.

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| **2. Integrated pest management approaches adopted by smallholders in Fogera and Mecha.**<br>Specifically, farmers will adopt a range of cultural, physical and biological measures to manage crop pests. Chief amongst these will include enrichment of field margins to provide habitat for natural enemies and use of food sprays to attract natural enemies – together enhancing natural pest control services by boosting biodiversity. | 2.1 ~~50~~ 45 Government extension workers know the basics of IPM what it is, why important, how to do it and learn of examples from Ethiopia through 5 day training in 22/23 [25 in 22/23 and 10 in 23/24 and 10 in 24/25<br><br>2.2 120 farmers [40% F] know basics of IPM; what it is, why important, how to do it and learn of examples from Ethiopia through 3 day training [24 in 22/23, 32 in 23/24 and 64 in 24/25]<br><br>2.3 Appropriate IPM measures tested by farmers, in Fogera and Mecha, for vegetables and pulses, through 30 Farmer Field Schools (FFS) and IPM trials [6 FFS set up in 22/23, 8 in 23/24 and 16 in 24/25]<br><br>2.4 900 FFS farmers [360 F, 540 M] gain skills and knowledge in IPM so they can apply proven measures in their farms and teach others. 180 in 22/23, 240 in 23/24 and 480 in 24/45.<br><br>2.5 240 farmers learn results of IPM trials through field visits, together with 34 govt. staff [12] each year. [80 different farmers each year]<br><br>2.6 120 farmers [40% F] learn results of IPM trials in workshop, together with 34 govt. staff each year [40 different farmers each year] | 2.1 Evidence of knowledge of IPM by extension workers shown through interviewing a sample of attendees 6 months after training in 22/23.<br><br>2.2 Evidence of knowledge of IPM by farmers shown through interviewing a sample of women and men attendees 6 months after training in 22/23, 23/24, 24/25.<br><br>2.3 Assessments / results of FFS trials including data about farmer [M,F] attendance, pest levels, presence of natural enemies, disease infestation, crop yield, profit margin and use of trap crop across all three years.<br><br>2.4 Survey of skills and knowledge of women and men farmers, through interview and visiting farms to see IPM being practiced, including images and testimonials from project farmers, across all years.<br><br>2.5 Evidence of adequate knowledge of IPM, gained through interviewing a sample of field visit participants 6 months after the visit in 22/23, 23/24 and 24/25.<br><br>2.6 Record of IPM field trial result sharing workshop proceedings in 22/23, 23/24 and 24/25. | We assume that the government extension workers will support the project and work alongside project staff to regularly follow-up the FFS and collect trial data. We assume that if there is staff turnover new staff can be trained to get 'up to speed'.<br><br>Based on discussion we know some farmers are willing to allocate land to FFS trials and some are unable at project start. Where farmers are not able to allocate land we have made alternative arrangements to use FTC land and to rent land in some cases.<br><br>Weekly, attending 1 to 2 hours learning in FFS is time intensive and demands high commitment and we assume that all farmers make time to participate in FFS trials and to share the knowledge they gain from FFS to other farmers. PAN-Ethiopia have achieved high retention rates in other projects. |

[12] Government staff = 34 from field, zonal and regional level, same 34 each year.

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| **3**. **Beekeeping enterprises established and re-established by smallholder farmers.**<br>Youth, women and both new and existing beekeepers will receive training and support to establish profitable home-based beekeeping enterprises. | 3.1 44 Government extension workers have skills and knowledge in advanced sustainable beekeeping by end 23/24.<br><br>3.2 120 new beekeepers [at least 60F] know how to make hives, procure bees, establish apiaries, ~~60 in 22/23 and 60 in 23/24~~. [change this to 120 in 23/24]<br><br>3.3 80 former/declining beekeepers [almost all former are men] gain skills and knowledge in bee colony multiplication and top-bar beekeeping by end of ~~23/24~~ [change this to 22/23]<br><br>3.4 200 *** beekeeper [total of those above] know how to boost forage availability for honey bees, enrich habitat and protect colonies from pesticides [60 in 22/23, 140 in 23/24].<br><br>3.5 200 [80 former, 120 new] beekeepers start or re-establish beekeeping with small input provision from project and engage in profitable beekeeping at household level ~~[60 in 22/23, 140 in 23/24]~~ Change to 200 in 23/24<br><br>3.6 200 smallholder farmers [at least 60 F] know how to get the best price for their honey by end of 24/25<br><br>***Of these 200 people, 100 are also FFS participating farmers | 3.1a Interviewing sample of attendees 6 months after training, checking their knowledge of beekeeping using BfD-developed skill score by end 23/24.<br>3.1b Training attendance registers<br><br>3.2a Interviewing sample of attendees 6 months after training, checking their knowledge of beekeeping using BfD-developed skill score.<br>3.2b Training attendance registers.<br><br>3.3a Evidence of good knowledge of colony multiplication and top-bar beekeeping, by interviewing attendees 6 months after training.<br>3.3b Training attendance registers<br><br>3.4a Evidence of good knowledge of forage development and habitat enrichment, by interviewing attendees 6 months after training.<br>3.4b Training attendance registers<br><br>3.5 Data about honey bee colonies kept and honey yields, through household surveys x 3 (each year).<br>3.5b Registers of inputs supplied and received.<br><br>3.6 Data about honey sales and income, through household survey. | We assume that beekeepers and non-beekeepers are able and committed to apply IPM and reduce pesticide application.<br><br>We assume that the current high demand for honey persists. |
| **4**. **Farmers, government extension workers and other stakeholders have good understanding about instruments and guidelines to support biodiversity-friendly agriculture.** | 4.1 ~~56~~ 46 key stakeholder organization heads, directorates and experts have good knowledge about CBD, government policies, proclamations and regulations on biodiversity conservation, pesticide use, | 4.1a Evidence of adequate knowledge of biodiversity friendly policies, proclamations and regulations, by interviewing a sample of attendees 6 | We assume that government remains committed to co-hosting policy familiarization and analysis workshops and |

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| Specifically, stakeholders, including vendors of agrochemicals, will have knowledge of (i) government policies, proclamations and regulations on protecting biodiversity (ii) responsible use of agro-chemicals, toxicity of different products. iii) lessons learned from project actions and results | managing pollinators and sustainable agriculture by end 22/23.<br><br>4.2 Analysis of gaps and strengths of government policies, proclamations and regulations in relation to 4.1 undertaken by 56 key stakeholder organization heads, directorates and experts in 3-day policy analysis workshop by end 23/24.<br><br>4.3 Information booklet about pollinators, natural enemies of crop pests and impact of pesticides on the agro-ecosystem in Amhara published and used by key stakeholders in 23/24. [2,000 hard copies distributed, e-copies also available on partners' websites].<br><br>4.4 500 IPM and beekeeping newsletters published twice each year and read by key stakeholders [500 x 2 x 3 = 3000, e-copies also available on partners' websites] | months after policy familiarization workshop 22/23.<br>4.1b Policy familiarization workshop attendance register<br><br>4.2a Evidence of analysis informing government programming, through interviewing stakeholders 23/24.<br>4.2b Record of policy analysis workshop proceedings 23/24.<br><br>4.3a Evidence of use of the information booklet by key stakeholders in their regular activities, gained by interviewing sample of key stakeholders 6 months after booklet distribution in 23/24.<br>4.3b Copy of booklets and dissemination records in 23/24.<br><br>4.4a Evidence of reading and using newsletter information by key stakeholders in their activities, gained through interviewing users 2 x each year.<br>4.4b Copies of published bi-annual newsletters and dissemination records for each year. | advocate and enforce government policies, proclamations and regulations. |

**Activities** (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

1.1. Experts and Development Agents in livestock and crop production (government extension workers) attend 3-days training courses in harmful impact of pesticides and the role of beneficial insects in sustainable agriculture

1.2. Experts and Development Agents in livestock and crop production (government extension workers) attend 3-days training courses in local agro-ecosystem, in pollination and sustainable agriculture

1.3. Smallholder farmers [40%F] attend training courses in understanding their local agro-ecosystem and in pollination, attend 4 half-day sessions at local Farmer Training Centres in 2022, 2023 and 2024

1.4. Experts and Development Agents in livestock and crop production (government extension workers) and smallholder farmers participate in agro-ecosystem walks to understand their local agro-ecosystem and the role of ecosystem services

1.5. ***Learning About Pollinator*** days: group of 30 pollinator observers are taught by entomologist how to observe, recognise and describe locally-found flower-feeding insects in the project areas – through fieldwork – so they can share these skills and knowledge with others.

1.6. Produce an easy-to-use ID guide for the most commonly found bees, other pollinators and natural enemies using local names and descriptions

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| 1.7. | Pollinator observers conduct flower-insect timed counts using ID guide [1.6] in IPM plots and normal plots (2km distance between) in 24/25 |
| 2.1 | Experts and Development Agents in livestock and crop production attend training in Integrated Pest Management (IPM). |
| 2.2 | Smallholder farmers [40%F] attend training in IPM. |
| 2.3 | Establish Farmers Field Schools (FFS) for IPM field trial and learning in 8 kebele (2 woredas), design trials with range of measures |
| 2.4 | Conduct Integrated Pest Management trials in FFS, field workers and farmers to make weekly assessments, collect, record and analyse data |
| 2.5 | Experts and Development Agents in livestock and crop production (government extension workers) and smallholder farmers participate in IPM field visit in the project kebeles (within the project woredas). |
| 2.6 | Officials, Experts and Development Agents in livestock and crop production and smallholders attend workshops to learn of IPM field results. |
| 3.1 | Experts and Development Agents in livestock and crop production attend training in advanced sustainable beekeeping. |
| 3.2 | Smallholder farmers [80 M and 60 F] attend training in how to make hives, how to get bees and how to establish apiaries and basic beekeeping |
| 3.3 | Former/declining beekeepers attend training in bee colony multiplication and top-bar beekeeping |
| 3.4 | All beekeepers given training in how to boost forage availability for bees, how to enrich habitat and how to protect colonies from pesticides |
| 3.5 | Small input provision procured and donated to beekeepers, based on needs assessment |
| 3.6 | All beekeepers given training in how to get the best price for their honey (in marketing, quality assurance, understanding the market) |
| 4.1 | Key stakeholder organization heads, directorates and experts attend policy familiarization workshop on CBD, SDGs, and government policies, proclamations and regulations on biodiversity conservation, poverty reduction, pesticide use, pollination services and sustainable agriculture. |
| 4.2 | Key stakeholder organization heads, directorates and experts attend policy analysis workshop on CBD, SDGs, and government policies, proclamations and regulations on biodiversity conservation, poverty reduction, pesticide use, pollination services and sustainable agriculture. |
| 4.3 | Publish and distribute information booklet about pollinators, natural enemies of crop pests and impact of pesticides on the agro-ecosystem in Amhara (hard copy and electronic means). |
| 4.4 | Publish and distribute Bi-annual IPM and beekeeping newsletters in hard copy and electronic means. |

Key to changes
Yellow highlight = improvements to Logical Framework in response to feedback following initial grant offer
Turquoise highlight = changes made in November 2022, approved.
Green highlight = change request dated December 2023

# Annex 3: Standard Indicators

## Table 1 Project Standard Indicators

| DI Indicator number | Name of indicator | Units | Disaggregation | Year 1 Total | Year 2 Total | Year 3 Total | Total to date | Total planned during the project |
|---|---|---|---|---|---|---|---|---|
| DI-A01 | 36 govt. extension workers complete structured and relevant training about harmful impact of pesticides and role of beneficial insects, about pollination and sustainable agriculture.<br>Output 1.1 and 1.2 | People | Gender | 13 F<br>34 M | 5 F<br>11 M | | 63 | 36 |
| DI-A01 | 120 farmers complete structured and relevant training about local agro-ecosystem, pollination, beneficial insects and harm caused by pesticides.<br>Output 1.3 | People | Gender | 64 F<br>108 M | 70 F<br>165 M | | 407 | 120 |
| DI-A04 | 900 farmers reporting that they are applying new IPM practices and using less pesticides 12 months after training.<br>Outcome 0.1 | People | Gender | 0 | 23 m, 3 w (that we know about) | | 25 | 900 |
| DI-C01 | One information booklet about pollinators, natural enemies of crop pests and impact of pesticides on the agro-ecosystem in Amhara published and endorsed.<br>Output 4.3 | Number | Subject matter = pollination and agroecology | 0 | 0 | | | 1 |
| DI-D02 | 200 farmers whose disaster/climate resilience has been improved through earning new income from beekeeping.<br>Outcome 2 | Number | Gender<br>Income | 0 | 24 m<br>8 w<br>Earned new income | | | 200 |

## Table 2 Publications

| Title | Type<br>(e.g. journals, best practice manual, blog post, online videos, podcasts, CDs) | Detail<br>(authors, year) | Gender of Lead Author | Nationality of Lead Author | Publishers<br>(name, city) | Available from<br>(e.g. weblink or publisher if not available online) |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

## Annex 4: Onwards – supplementary material (optional but encouraged as evidence of project achievement)

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## Checklist for submission

| | Check |
|---|---|
| Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission? | ✓ |
| **Is the report less than 10MB?** If so, please email to BCF-Reports@niras.com putting the project number in the Subject line. | ✓ |
| **Is your report more than 10MB?** If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line. | no |
| **Have you included means of verification?** You should not submit every project document, but the main outputs and a selection of the others would strengthen the report. | ✓ |
| If you are submitting photos for publicity purposes, do these meet the outlined requirements (see Section 16)? | ✓ |
| Have you involved your partners in preparation of the report and named the main contributors | ✓ |
| Have you completed the Project Expenditure table fully? | ✓ |
| Do not include claim forms or other communications with this report. | |