



PESTICIDE ACTION NEXUS
ASSOCIATION (PAN-Ethiopia)

Pesticide Action Nexus Association (PAN-Ethiopia)¹

Report of the project:

**Supporting the sustainable cotton production initiative in
the southern Rift Valley of Ethiopia**

Submitted to Amber Foundation

**Tadesse Amera
February, 2017**

¹ Pesticide Action Nexus Association (PAN-Ethiopia) P.O.BOX 25765 Code 1000 Addis Ababa, Ethiopia.
E-Mail: pan.ethiopia@gmail.com; Tel. +251-116-186774; Fax +251-116-186769

Pesticide Action Nexus Association

Project Report for Amber Foundation

1. Project title: Supporting the sustainable cotton production initiative in the southern Rift Valley of Ethiopia

2. Background to the organization

Pesticide Action Nexus Association (PAN-Ethiopia) is an Ethiopian residents NGO established to work on environment and development so as to enhance and promote safe and sustainable environment protected from harms posed by pesticides and other hazardous chemicals by promoting the close collaboration of government, non-governmental organizations; civil society interest groups, urban and rural communities.

Since 2005, PAN-Ethiopia has been working on mitigating the impacts of pesticides on human health and the environment in central and southern Ethiopia Rift Valley through awareness creation and community based Farmer Field Schools (FFS) with small-holder farmers. Cotton Integrated Pest Management (IPM) project which has been funded by the Textile Recycling Aid for International Development (TRAID)-UK is a pioneer for organic cotton production by small-holder farmers in Gamo Gofa Zone in Southern Ethiopia- certification of these farmers for organic is under way. This project has also been supported by the Darwin Initiative funding so as to work on mitigation of pesticide impacts to biodiversity through an ecosystem approach for agricultural development, especially by adopting the cotton IPM-FFS techniques for reduced and responsible use of pesticides within central Rift Valley vegetable producers.

Based on the above mentioned project progress, the Amber Foundation has also been supporting this initiative to fill the gaps through the project entitled Supporting the sustainable cotton production initiative in the southern Rift Valley of Ethiopia. This project has been implemented for two years, in 2015 and 2016; and this report covers the project period of 2016.

3. Project outline

The sustainable cotton project is an ongoing project being implemented in the Southern Nations Nationalities and Peoples Region, Gamo Gofa zone; Arba Minch Zuria and Merab Abaya districts. Eight kebeles² (Villages) have been covered in the two districts. The zone is one of the areas where there is cotton production by smallholder farmers. These farmers used to use highly hazardous pesticides for pest control purposes which have environmental and human health hazards. PAN-Ethiopia has been working in the area to reduce the farmers' dependency on these pesticides by training them on alternative ecological pest management techniques. In the TRAID project, farmers have been trained on season long integrated pest management techniques. The project has been promoting the use of an ecological pest management technique called food spray. It plays a role in pest management by attracting natural enemies into the sprayed cotton field so that they can feed on insect pests. It helped farmers to reduce/cut the use of hazardous pesticides and increase their cotton yield. This process was also scientifically proved and the research finding is published at the

² The lowest administrative unit of the government system

International Journal of Pest Management:
<http://www.tandfonline.com/eprint/fC3kvGq5y75Jj9qzKPhR/full>.

Capacity building trainings included local agricultural development agents to help them raise their awareness on plant protection and agronomic practices to integrate into the government extension system as it will help the practices to be expanded to new areas. With a complementary support received from Amber foundation, the cooperative could collect the 2015 cotton harvest together and managed to sell it to the central government with a better price. Taking the lesson from the 2015 production season, the farmers could collect more cotton in 2016 and sold it to the central government with a better price than the previous year.

4. Project description

The project aims to support and strengthen the existing cooperative and the women cotton spinning association to strengthen the market linkages of small cotton farmers. The main components of the ongoing project has been financed by TRAIID and the support from Amber fills the gaps in cotton value chain and is helping farmers to undergo experience sharing field visits and disseminate better production systems and best practices to agricultural extension agents, agriculture office experts and the community at large.

5. Activities Accomplished

5.1 Training of farmers in cooperatives on cotton harvesting and storage quality control:

The cooperative is getting stronger financially and in administrative capacities since its establishment in 2014. This was mainly because the farmers and the cooperative management team were able to get experiences from the marketing and cooperative management experts. There were plenty of challenges since the establishment of the cooperative which in turn helped the farmers to learn from the process. The previous challenges, including access to market (which was one of the biggest issues the farmers have been asking for many years), were alleviated in 2015/16 production season. The cooperative was linked with the Ethiopian Industry Inputs Enterprise and the two parties established legal agreements for cotton transaction.

In 2015, the cooperative ginned a total of 600 quintals (60 Metric tonnes) of seed cotton which gave them 22.85 Metric tonnes of lint cotton. The laboratory analysis of their lint quality was done and the result was grade “A” and the cooperative received 33.00 ETB³ per Kg. The price was determined according to the national cotton market based on the grade. Hence the cooperative received the highest price per Kg in the year 2015. In addition to that; 34.90 Metric tonnes of cotton seed was sold to edible oil refiners with a price of 6.30 ETB per kg which gave them a total of 219, 870.00 ETB-which was an additional income source for the cooperative.

The experience in the process and the profit they got from the 2015 season helped them to decide buying cotton from other IPM project farmers by competing with the local merchants

³ Ethiopian Birr, 1 ETB is equivalent to 24€

in the 2016 season. They, therefore, managed to hold 1,599.50 quintals (159.95 Metric tonnes) of seed cotton; which was more than a double of the 2015 season. The market link and ginning service used in 2015 were used in 2016 as well and the process to get the ginning service and selling lint cotton was much easier for the cooperative in 2016. Ease of the process motivated the farmers to do marketing with little support from PAN-Ethiopia and the zone marketing department.

Laboratory result from the Ethiopian Industry Inputs Enterprise showed that the 2016 season cotton was also grade “A” again. The price of grade “A” lint cotton in 2016, as set by the Ethiopian Industry Inputs Enterprise was 35.00 ETB. When the cotton was ginned in 2016, the lint output was 38% while 55% was seed. Hence, 60.78 Metric tonnes of lint cotton was obtained from the 159.95 Metric tonne of seed cotton. The cooperative got a total sell of 2, 127, 335.00 ETB from the lint. The seed was 87.97 Metric tonnes and they sold 60 Metric tonnes for 5.00 ETB per Kg making it a total sale of 300, 000.00 ETB until this report was compiled and, the remaining was stored. Out of the remaining cotton seed, 7.5 Metric tonne is saved to go through the cotton seed cleaning process and will be used for 2017 cropping season. The cooperative will sell the seed to members and other farmers with fair price compared to the price in the local market. This was one of the main sustainability approaches to solve seed access problem in the area which had been a challenge for smallholder farmers.

The cooperative became known by the Federal Marketing and Cooperatives Department. The department invited two persons from the management team to take part and share their experiences in the national cooperatives meeting which was held in Adama (Nazreth)-Ethiopia in January 2017 where the farmers presented the success of the project.

5.2 Training the women spinning associations

Women farmers in three villages (Shelle Mella, Chano Mille and Faragossa) were organized and formed 3 cotton spinning associations. The main goal of the association was to empower women economically, and engage them in decision making and other social activities. The associations have been working on the production of hand spun yarn from locally grown cotton. They were linked with local traditional clothe producer handcrafts cooperative which was their direct market link. They also used their yarns to produce traditional clothes by contracting local weavers. This value addition and market link served as an additional source of income for women farmers.

Women empowerment trainings on leadership, financial management, income generation was given for lead women farmers in the association in 2015 and 2016. The 2016 training workshop was conducted to discuss their strengths, challenges and opportunities in their respective villages focusing on the market and value addition aspects. Representative from the zone marketing and cooperatives department were involved in the workshop and showed a promising start to support the associations mainly by giving trainings on financial and cooperatives management. Head of a local handcraft cooperative called JANO, took part in the workshop and agreed to take all the hand spun yarns from the associations. The head of JANO pointed out that signing bilateral agreements between their cooperative and the

spinning associations is a vital market tie with details of requirements agreed between the two parties. This created an opportunity and a better local market link for the associations.

5.3 Farmers exchange field visits to Farmer Field Schools (FFS)

Cotton grower smallholder farmers were trained on IPM principles including better agronomic practices and food spray techniques via farmer field schools. The sessions were season long so that the curriculum can include topics covering the lifecycle of cotton production starting from land preparation. The season long training was given once a week for about three hours per session. The topics included in the FFS curriculum were land preparation, seed viability test, sowing in space (farmers used to sow cotton by broad casting, sowing in space included keeping spaces between plants and between rows), insect scouting, preparation and application of food spray based on the insect assessment results and recommendations, human health and environmental impacts of pesticides and quality harvesting to avoid wastage from the harvested seed cotton.

Farmer field school sessions were facilitated by field agents from PAN-Ethiopia, plant protection experts from Arba Minch Plant Health Clinic and government agricultural extension agents from the respective villages. A total of 32 extension agents took part in the FFS facilitation in the 2016 production season of which 12 were female extension agents.

Cotton agro-ecosystem analysis

Using ecological agriculture was based on analysis of real situation using data/information collected by farmers via cotton agro-ecosystem analysis. Weekly observation of their cotton farms enabled farmers to collect agronomic and plant protection data which were used to make decisions on the need to apply food spray, to attract natural enemies based on the calculated pest to natural enemy ratios. Cotton agro-ecosystem analysis was done during the weekly FFS sessions. Insect scouting (counting the number of pests and natural enemies) was also conducted in certain sampling areas in the cotton plots to see the balances for natural pest management (biological control).

Insect scouting was an important part of the season long IPM-FFS training by which farmers learned about scouting methods and identification of major pests and natural enemies. This was a step forward in the use of biological control agents for pest management for cotton and which can also be applied for other crops.

Food spray application frequency

Food spray is used as food supplement to attract and conserve natural enemies in the sprayed cotton field. It was used as part of the cotton IPM; mainly used when the ratio of natural enemies to pests was in favour of pests. Application decision came from natural enemy-pest assessment results based calculated ratios in each site. The rationale of food spray application bases on the principles that one natural enemy can consume two pests and the need for food spray if the natural enemies to pests ratio became below 0.5. In the 2016 production season, food spray application frequency was twice in all the demonstration sites.

Cotton yield of the 2016 production season

Seed cotton yield of the 2016 production season was collected from the trial sites; in the smallholders' farm and Lucy commercial farm taken as a comparison site with conventional (chemical) treatment. Average seed cotton yield harvested from food spray treated plots was higher than the yield obtained from the untreated plots and farmers' practice plots. Despite the variations between the different sites; high seed cotton yield was obtained at Kolla Shara and Genta Kanchama sites from Arba Minch Zuria district while the lowest was obtained at Ugayo in Merab Abaya district (Table 1).

Table 1. Seed cotton yield obtained from different sites in the 2016 production season.

Treatments	Seed cotton yield in quintals/ha					
	Zeyse Elgo	Shelle Mella	Kolla Shara	Genta Kanchama	Ugayo	Lucy commercial farm
Food spray	32.98	37.03	37.58	32	16.45	23.57
Untreated	23.61	27.03	25.25	22.33	11.81	15.09
Farmer's practice	22.05	No farmer's practice plot	No farmer's practice plot	13.00	10.75	13.00
Chemical treated	NA	NA	NA	NA	NA	21.58

Note: 1. Farmers' practice plots were not setup in Shelle Mella and Kolla Shara because of the FTC plots were too small to accommodate more than one treatment. 2. Farmer's practice plot in the case of Lucy commercial farm was the yield taken from outside the trial plots 60 meters away from the trial plots. 3. Plots sizes were different in different sites depending on the size of the farms. Yield from the plots was then converted from Kg/plot size into quintals/hectare.

Seed cotton yield from 377 farmers who were involved in the FFS was collected. Total farm size planted with cotton by those farmers was 220.625 hectares. Seed cotton yield obtained from the above mentioned land size was 7,864 quintals (78.64 Metric tonnes) with an average of 35.64 quintals per hectare.

Experience sharing activities

Experience sharing activities on the IPM, FFS and food spray techniques for cotton production were conducted in different national and international events including during meetings with the local agriculture office, workshops and conferences. The following were among the national and international conferences where PAN-Ethiopia's experiences were shared:

5.4 Workshop participation and presentations made:

- With the objective of documenting works done on ecological organic agriculture, Mekele University organized a workshop from 5-7 September 2016. Universities, agriculture and plant protection research institutions and NGOs working on sustainable agriculture took part in the workshop. PAN-Ethiopia was invited to share its experiences on the use of IPM methods for cotton production. Experiences on the

use of IPM methods and food spray and the season long FFS approaches were shared in the workshop.

- PAN-Ethiopia became part of the green innovation center initiative organized by GIZ and a staff member is given a chance to visit organic farming activities in Germany
- The Arba Minch case was presented as a successful agroecology approach at High Level Segment Panel of the 4th meeting of the International Conference to Chemicals Management in Geneva (ICCM4)
- The project's result on the use of food spray was presented at the 25th International Congress of Entomology which was held in Orlando, Florida in September 2016.
- The whole project approach on reducing pesticide dependency to smallholder cotton farmers was presented at the annual general assembly meeting of IPEN which was held in San Francisco, California in November 2016.

Challenge faced in 2016

The cooperative collected seed cotton from members and non-member farmers during harvesting season. It paid for some farmers (money saved from 2015 season and from the 400,000.00 ETB loan they secured from the local credits association) while collecting but the money they had was not enough and had to buy cotton by agreements with individual farmers to pay back the money after the cooperative receives money from lint cotton sell. Processing the sell with the Ethiopian Industry Inputs Enterprise in 2015 took some time and farmers who sold their cotton to the cooperative put pressure on the cooperative management team by frequently asking for money. This was one challenge the management team spoke about indicating that frustration of losing the farmers in the coming seasons. So, the management team had to go through the challenges of convincing the farmers that the cotton had to go through the ginning and laboratory quality assessment process before the cooperative receives the exact price and the final payment. Through the lesson in the 2015 process, this challenge was mitigated in the 2016 production season.

Absence of warehouse was another challenge raised by the farmers. The cooperative had to rent a warehouse to store their cotton during harvesting season. Renting a warehouse required significant amount of money especially when they collected large volume of cotton. This was properly handled in the production seasons of 2015 and 2016. Now they have a plan to construct their own warehouse for the next season; but they needed financial and technical support from PAN-Ethiopia and the government. The cooperative already secured a 500 square meter space for warehouse construction from the local administration