

# **Report of PROLINNOVA–Ethiopia for the years 2014 and 2015**

**by  
Technical Advisory Group (TAG)  
Best Practice Association (BPA)**

**19 February 2016  
Addis Ababa, Ethiopia**

## I. THE MAIN ACTIVITIES ACCOMPLISHED IN 2014

### 1. Assessment and documentation of local innovation and best practices

PROLINNOVA–Ethiopia (PE) had paid attention to documenting local innovation through one of its member organisations, Best Practice Association (BPA), which is in fact fully dedicated to this idea. BPA had organised this work through local partners around Axum and financial support was solicited from the PROLINNOVA International Secretariat at ETC Foundation through the CLIC–SR (Combining Local Innovative Capacity with Scientific Research) project. In addition, the Alem Berhan Self-Help Community-Based Development Association (ABSHCBDA) has managed to identify and document interesting innovations during the reporting period.

Some local innovations that have been documented include:

**i. Water passage canal by Qeshi Nolawi.** He has developed a system to bring irrigation water from one side of a river to the other, using a mobile canal supported by wood logs.

**ii. Biofertiliser / tea manure and urine fertiliser by Gebreyesus Tesfay** (see also Section 3.2). Many farmers were not familiar with using chemical fertiliser. Even for those who knew about it, it was not accessible. Instead they practised new or other ways to improve soil fertility, such as by using tea and urine.

**iii. Fruit harvester by Kiros WoldeGebriel.** This is to harvest matured fruits from big and tall trees. Many farmers engaged in irrigation have planted fruit trees like mango, avocado and papaya but are facing challenges to climb the trees in order to harvest the matured fruits because the farmers may fall down or tree branches may detach from the main trunk. Therefore, they were looking for a safe way of harvesting. This innovator came up with a device to solve their problem.

**iv. Livestock.** As things became critical for livestock and crop production, farmers started coping with the problems by diversifying the types of animals they keep and reducing their number; this includes introducing new animal breeds into their herds to improve milk and/or meat production or to be more tolerant to less feed. However, not all new breed introductions have been successful, e.g. even though the new chicken breeds are good egg-layers, they are not productive with the traditional (poor-quality) chicken feed, are less resistant to disease and are susceptible to predator attacks. Some activities have included:

- Best chicken breed selection – by Mai Atsmi innovators' group.
- Best goat and sheep selection - by Hadush Adi and Mai Atsmi innovators' groups. Begayit sheep and goats are quick to grow and give higher milk yields, so families can get a better and quicker return than with the local breeds.

**v. Innovation in post-harvest technology: example of tomato processing.** Farmers' adaptation strategies have included crop diversification to generate income and feed their families, also starting to grow introduced crops. But neither the farmers nor the extension workers have a marketing strategy, and the farmers suffer from the market fluctuations. For example, the price of tomato went down from 24 Birr in January–March 2013 to 0.25 Birr (1 USD = 22 Birr) in the same season in 2014. This is because many farmers produce the same crop at the same time; moreover, tomatoes are highly perishable. Therefore, farmers are forced to sell at low prices. Mrs Brha Tadesse came up with a solution to this problem. She started drying her tomatoes and producing tomato slices and dried powder that can be kept up to six months. However, as these are foodstuffs, they need experimentation and validation of storage and food safety. Here is where researchers from Axum University and Axum Agricultural Research Centre are interested in working together with her and other women exploring such ways of adding value to their tomato crops.

**vi. Push-pull technology to protect from the Orobanche weed.** In many parts of Africa in general and Ethiopia in particular, striga and stockborer are the most difficult pest problems. They can destroy yields up to 100%. After the spread of small-scale irrigation in Tahtai Maichew, farmers observed that the *Orobanche* weed (locally called *silim*, meaning “a nap”) affects tomato, cabbage and potato. This is like the “push-pull” technology designed and introduced by ICIPE (Kenya) to protect against striga and stemborer, which involves interplanting of maize and sorghum with desmodium.

**vii. Yitay's modified beehive.** After critically examining the drawbacks of traditional, modern and transitional beehives, Yitay started to construct his modified beehives by combining good components from each beehive in order to harvest better honey. Yitay took planks, which are put at the left and right side of his beehives and top bars from transitional and queen excluder from modern beehives. In addition to these, he used pieces of thin gird and nails and combined these parts to create a comfortable environment for bees and for management of their colonies.



According to his own evaluation, his modified beehive is easy to manage. It is easy to clean the inside and outside parts by opening planks which are attached on the worker bee's side of the beehives, regardless of the quantity of bees, which in turn contributes to produce good-quality honey and maximise adaptability of bees since it reduces the opportunity of bee insect reproduction. It is also very easy to make it from inputs and equipment that are easily accessible and affordable with simple knowledge and skills. Furthermore, it enables worker bees to produce honey parallel to their position, not to the upper side of their position which in turn helps them make honey faster than in other beehives. It is very simple to harvest the honey. One person can harvest honey without destroying and disturbing the larva and combs. It also reduces the probability of being bitten by the bees during harvesting since the harvester can push worker bees from the honey towards the queen's side of hive through smoke. Unlike modern and transitional beehives, it is easy to substitute honeycombs; they can even substitute combs by themselves instead of demanding support from another person if the honey is harvested on time.

**viii. Building Irrigation canals across long rocky and rough terrain.** Mr Setegn Chekol realised that rainfed agriculture cannot alleviate his problem since his area is frequently affected by shortage of rainfall and seasonal drought. Then he decided to grow cereals and crops through irrigation by taking water across long rocky terrain. His land is located further up the river, which makes it very difficult to irrigate by taking water from lower and level land to the mountainous and rugged parts of the land. Then he started construction of his irrigation channels by going more than three km from his land to the upper parts of the river to make his channel inclined and sloping so allow water to flow easily to his land. He built the channel by making a high retention wall using stone, sand, soil and stemwood collected from the higher mountainous land and the river valley towards the river valley side and by deeply digging the slope of mountain. Setegn had thought of planting fruit trees and then began producing vegetables and fruit. He gradually made his area into a centre of vegetable and fruit production and now he grows more than 19 vegetable and fruit species. Setegn now earns more than 3000 Birr per week from vegetables and fruit during the production season and earns an annual income of more than 200,000 Birr from all his income sources.



**ix. Yirga's row-sowing tool.** Abere nailed holes in the surface parts of plastic bottles for sowing wheat seed and fertiliser; the number of outlets in each bottle depends on the fertility of land and the size of wheat seed variety. Abere showed his innovation to agricultural extension workers and received appreciation and comments to further improve his design. According to him, if the land is fertile, the number of holes for each plot has to be minimised so as to minimise the amount of wheat seed and fertiliser sown in each row, but if the land is less fertile, it is better to increase the number of holes in the bottles to increase wheat seed and fertiliser sown per row. Abere's row-sowing tool greatly reduces daily labour demands by 1–2 workers per day, which reduces the farmer's expenses for labourers. Furthermore, since the tool better distributes wheat seeds and fertiliser than sowing by hand, it saves wheat seed and fertiliser and enables to effectively utilise the land. According to Yirga, this also it increases wheat productivity.

**x. Haricot bean (*bolokie*) crop pest control.** Farmers start to practise sowing of haricot bean in three different periods. Hence, they divided their land into three plots and started to sow haricot bean a) before the wet season, when the soil has no moisture, b) after a little rain, when the soil has a little moisture, and c) during the main wet season, when the soil became full of moisture. After repeated observations, they realised that haricot bean which is sown when the soil has medium moisture is totally destroyed by the pest since its breeding time matches with the early growth stage of the haricot bean, when it grows no more than two leaves, which is very suitable stage of haricot bean growth for pest damage. But they found that haricot bean which is sown when the soil has adequate moisture was not affected by the insect, since the moisture is not conducive for its reproduction, but the plants are not productive, since their growth is not good enough to hold more beans and the dry season begins before the bean crop matures. Finally, they understood that haricot beans which are sown before the rain starts, when the soil has no moisture, is not affected by the pest since it breeds after the haricot beans grow more than two leaves, which is not suitable for the pest to eat. Moreover, the haricot bean plants grow more strongly and can hold more beans and production is not be interrupted before they mature. As a result of all these, its productivity is doubled. In addition, since the haricot beans mature earlier than the end of the rainy season, it enables farmers to harvest two times per year on a single crop field, which further increases productivity and the food-security status of the farmers. However, the experimenting farmers recommend that farmers should sow after forecasting that the rains will start immediately after they sow the haricot bean and have to increase the number of seedlings per hole when compared with other seasons to compensate for seeds that will perish if the rain does not start immediately.

**xi. Cattle and sheep tick control (curing)** by Addis Alem Farmer Field School (FFS). Sheep tick problem coupled with poor soil fertility and natural disaster like snow exposed the high-altitude community to hunger, drought and food insecurity. By understanding this adverse situation of food insecurity possibly caused by climate change, the FFS tried to solve the sheep tick problem using local knowledge. The FFS uses *azoareg*, *geberembuay*, *timbahoo* and *mehan endod* (all local names) as local solutions. These plants were dissolved together and the farmers wash the ticks with these botanicals. Some of the botanicals can be used instantly. In this way, they can remove the ticks from the skin of the sheep.

Beyond curing their cattle and sheep, these farmers created awareness among farmers on *idir* and *senbete* (traditional social and financial institutions) concerning their medicine and how to apply it. They recommended that farmers have to put the fluid only on the inside parts of the tick without dropping the fluid on the skin of cattle and sheep, since it injures their skin. They also give free service for aged and weak farmers who cannot prepare and use their medicine by themselves. Now farmers in their subdistrict widely use their medicine for treating their cattle and sheep and thus increased animal health and reduced their death rate. As a result, they have raised their income generated from animals, leather and skins. This innovation also reduced time, labour and financial expenses for vaccination of their cattle and sheep in modern animal clinics.

Since they prepare their medicine from the fluids of plants, it would seem to be an unsustainable technology that aggravates deforestation and contributes to soil erosion and degradation in general if it is seen uncritically. Paradoxically, however, they found that it is a very sustainable technology that positively contributes to afforestation, since farmers have started to widely plant and tend these medicinal plants in their homestead and woodlot land.

**xii. Etiye's traditional house.** Etiye is a woman who has great ambition to see her house beautiful. This ambition was ignited after she saw sofas and other furniture in the town. In 2000, she started modifying and improving traditional furniture (*medeb*) made from mud, teff straw and stone. According to Etiye, she was keenly interested to acquire furniture since her early childhood, but she could not afford to buy modern furniture such as chair, table, shelf, bed and others, which are made using modern technology and are costly. She therefore decided to construct such furniture from inputs that are easily accessible locally. She copied the design of modern house furniture and made her own from mud, bamboo, ash and paper, using her mosaic-making skills. Her innovation has great advantages for poor and marginalised segments of the population who, like her, cannot afford to buy modern manufactured furniture.

## **2. Different experience-sharing visits and events**

The purpose of experience sharing was to inform farmers about ongoing developments in distant places for farmers. Farmers often tend to believe their own observation more than anything else. BPA was the lead facilitator, and various other members of PE participated directly or indirectly.

**2.1 Public lecture** on "Nurturing the Practice of Home-Grown Leadership and Development Initiatives" was conducted on 17 April 2014 in Addis Ababa University. It was organised by the Department of Geography and Environmental Studies of the University, BPA and Jerusalem Children and Community Development Organization (JeCCDO). It was focused on the Awra Amba community, which is recognised to be a very unique community in Ethiopia in terms of its value systems including gender, leadership, work ethic, natural resource management and beliefs. Many people believe this community is a very progressive one, which could possibly provide lessons to other farmers as well as to academia.

**2.2 Friends of Farmers** established in Axum area in order to enhance good practices between the older and young generations. Students from Aksum University and local schools travelled twice to farmers' houses to see their practices, especially local innovation and development.

**2.3 International Farmer Innovation Day** was conducted under the theme "The contribution of innovative farmers to healthy soil" for a half-day on 16 December 2014 at Hawassa in Southern Ethiopia. Presentations were made by Kassa Tekla from the Agriculture Faculty of Mekelle University and innovator farmer Beyene Tadesse from Hitossa District of West Arsi Zone. The presentations focused on soil fertility management.

## **3. Capacity building and food security**

### **3.1 Cascading of Participatory Innovation Development on beekeeping**

The training was designed to build the capacity of the local community to cascade the Participatory Innovation Development (PID) work of Innovator farmers in the Axum area. The aim of this training was to improve the quality and quantity of honey and wax production by beekeepers based on the joint experimentation results of the innovator farmers of Tahtai Maichew (TM) in collaboration with Axum Agricultural Research Centre, Aksum University and TM District Agriculture Office. There were 21 participants, of which one was female.

### **3.2 Joint experimentation and demonstration**

**Variety adaptation trials.** Farmers conducted variety adaptation trials on two fruit crops:

- **Apple.** An apple adaptation trial was done in TM District. A Farmer Research Group (FRG) established in Akab Se'at village was trained to try out three apple varieties. There were 21 participants (5 female).
- **Pineapple.** Pineapple variety adaptation trials were carried out by farmers in TM and Rama. The training took place from 15 to 17 May 2014 with two FRGs set up in Mereb Lekhe in the Rama area and Mai Atsmi in TM District. The purpose was to prepare for joint experimentation by farmers, extension experts and researchers (horticulturalists and entomologists) on a pineapple variety introduced to two locations in Tigray where there is good irrigation water supply.

<i>Boiling raw wax over fire to extract pure wax</i>	<i>Extracted pure honeybee wax</i>
<i>Orienting on how to extract honeybee wax</i>	<i>Cleaning raw honeybee wax before extraction</i>

***Trainees practising honeybee wax extraction***

**Experimentation on preparing and using biofertiliser.** Biofertiliser is a liquid natural fertiliser made from green vegetation mixed with liquids, i.e. water and/or dung and/or urine. Farmers also called it plant liquor, plant juice, liquid manure, plant tea, plant glucose and manure tea. In other words, it is a fermented juice of leaves, fruits, stems or roots of plant materials prepared by chopping and soaking in a liquid. The green material used for preparing biofertiliser is from plants with high nutrient content, mainly of nitrogen. The plants included are clearly recognised by their soft leaves and dark green colour.

***Gebreyesus' cabbage field (left of line with chemical fertiliser, right of line with biofertiliser)***



**Same variety of teff: left with chemical fertiliser and right with biofertiliser**

The application of biofertiliser led to an immediate response in changing the performance of plants (vegetables, fruits and grain crops). The growth of the stems, leaves and fruits is impressive. Therefore, the local experts who originally introduced the idea and the farmer innovators who adapted it now recommend that farmers prepare biofertiliser in a simple way. As crops in irrigation areas have high nutrient demands, this could be one area for dissemination of this technology. The challenge is that analysing the nutrient level (NPK) of the biofertiliser is expensive.

#### **Farmers' experimentation: sex identification of chicks by egg shape**

The idea for this came when Ethiopian farmer innovators took part in the Eastern Africa Farmer Innovation Fair in May 2013 in Nairobi and met a Kenyan woman innovator who had developed this technique.

The objective of the Ethiopian farmers' experimentation was sex identification of chicks before hatching, just by observing the external shape of the egg. The hypothesis was that, if the egg has a pointed end, the sex will be female, while the broad edges shape (*dimbilbulo*) is for males. The farmer researchers identified different criteria and procedures for the joint experimentation:

- i. identifying egg shapes: the shape of the eggs should be very clear, either sharp/narrow-edged or broad edged;
- ii. identifying good season for the joint experimentation, i.e. according to farmers, the chicken hatching season should not have too wet or too hot weather, as this weather is not comfortable for the hens to brood for the time required. The hens should be the local breed;
- iii. deciding how to apply the hatching process. As it is not easy to identify which chick is from which type of egg after hatching, the experimentation team agreed to choose one type of egg to give to each farmer for hatching;
- iv. identifying and selecting volunteer farmers for the experimentation.

Five experiments were conducted during 2014 by two farmers: Ms Brha Tadesse from Mai Siye and Mr Abadi Redehey from Mai Berazio subdistrict of TM District near Axum. The results of the five experiments are summarised in Table 1. Out of the 41 sharp/narrow-edged eggs hatched, 37 became female chicks; this shows a very high level of precision in favour of the stated hypothesis. On average, sex determination was correct for 90% of the eggs, i.e. sharp/narrow-edged eggs give female chicks and broad-edged eggs give male chicks. The average hatching level was 87% with a range from 84.6 to 90%. The more eggs given to the hen to hatch, the lower the number of eggs hatched and vice versa. This indicates that the number of eggs also matter in the hatchability percentage.



**Sharp/narrow-edged eggs give female chicks Broad-edged eggs give male chicks**

Many people were excited about the research results because identifying chicken sex based on egg shape is new knowledge. Farmers decided to use these results for future planning. If they plan to get layers, they use the narrow/sharp-edged eggs while, if they want to sell cocks, they use the broad-end egg shape. Cocks are in very high demand during festivities (New Year, Easter, Christmas etc) and farmers are always eager to have more cocks than layers during those periods. Farmers are now trying apply the results of their experiment in their desire to generate income by producing chickens. However, all participants proposed verification by formal research (research centre and university) for more precision and communication.

**Table 1: Farmers’ experiment using egg shape to determine chick sex**

No.	Name	Sex of farmer experimenter	Shape	Date*	No. of eggs		Sex of chick
					Provided	Hatched	
1	Birha Tadesse	Female	Narrow	12/10/2007	10	8	Female
2	Birha Tadesse	Female	Narrow	14/10/2007	6	5	Female
3	Birey Tetemke	Female	Broad	15/08/2007	10	9	Male
4	Hiwet Tsegay	Female	Narrow	15/08/2007	11	10	Female
5	Gebreyohannes Tewolde	Male	Broad	15/08/2007	5	4	Male
6	Brikte GebreSelassie	Female	Narrow	15/08/2007	5	5	Female
7	Zafu Amare	Female	Broad	15/08/2007	6	5	Male
8	Fiseha Sibhatu	Male	Narrow	19/10/2007	5	4	Female
9	Gebreyesus Tesfay	Male	Narrow	15/02/2007	10	8	Female
10	Asefa	Male	Narrow	01/08/2007	8	6	Female
11	Asefa	Male	Narrow	09/08/2007	10	10	Female
12	Wahid Berhe	Female	Narrow	13/02/2008	12	11	Female
13	Mebrat Abay	Female	Broad	24/01/2008	12	12	Male

\* Dates are given according to the Ethiopian calendar, which is about 7–8 years behind the Western calendar.

Now the selection of the female or male egg by shape is solved. All the hatched eggs became the right selection, i.e. the sex determination rate according to egg shape has improved to 100%. Mostly women plan in order to get female chicks while men look for cocks (male). This suggests that the women have an extended vision or plan while the men seek short-term income.

### Impact of honeybee pollinators

Training on the importance of honeybee pollinators in improving crop yield was given for 49 (40 male and 9 female) participants in TM and Laelay Maichew (LM) Districts. The training was given by District Agricultural Office and Axum Agriculture Research Centre experts.

Faba bean, an important source of protein especially for the poor, is now becoming an important source of income for farmers throughout the country. This crop is mainly used to prepare traditional foods such as *shiro*, *hilbet*, *siljo* and *nifro*. According to CSA (2013)<sup>1</sup>, the area covered by faba bean was 45% of the total pulse production. The productivity of faba bean in Ethiopia varies from 10 to 45 quintals/ha under farmers’

<sup>1</sup> CSA. 2013 (2006 Ethiopian calendar). Population Annual Estimation Report. Addis Ababa: Central Statistic Authority.

practices. Proven varieties and proper application of organic and inorganic fertiliser, timely weeding, integrated pest management and well-managed honeybee pollination enhance its productivity. The central zone of Tigray is suitable for faba-bean production; therefore, the general objective of this study was to see the role of managed honeybee pollination on faba-bean yield. Farmer had convinced the district agriculture staff that pesticides kill honeybees and then discussed with the staff about doing this experiment.

In order to see the effect of managed honeybee pollination, other factors had to be ruled out. The experiment therefore had three treatments:

- 1) faba bean accessible to all flower visitors – the plots was left open for natural pollination;
- 2) faba bean not accessible to any insects – the plots was covered with insect-proof mesh cage and then all insects were removed from the cage as control;
- 3) faba bean accessible only to honeybees – the plots was covered with an insect-proof mesh cage and a honeybee colony with five frames starter beehives was placed inside the cage.

The data showed that pollination type affected significantly the yield of faba-bean seed. This shows honeybee pollinators were more successful pollinators of faba-bean flowers than other insect pollinators. The result also revealed that faba-bean seed on plots covered with honeybee and pollinated by all insects were higher in grain yield than the control.

### **Implementation of farmer-led innovation development in three FFSs by supporting exemplary work coming out of farmer-led innovation in each FFS (pest management, goat breeding)**

As a continuing effort of ABSHCBDA, the FFSs are gradually strengthening their capacity and have been doing various types of research to solve their own problems by themselves. Many community members learn more from them and start to follow or adopt PID activities of the groups. It is obvious that exemplary work of those FFSs' PID activities should be selected and scaled out to other community members and to other areas. Having this in mind, ABSHCBDA organised a PID model development workshop in three FFSs by accommodating examples coming out of farmer-led innovation development in each FFS. The workshop had the following objectives:

1. To identify exemplary local innovations that the community has developed by doing informal research in the group and having socio-economic value
2. To identify the best exemplary innovations from the FFS work in a participatory manner
3. To create awareness in which local innovation development is the duty and responsibility of many concerned stakeholders
4. To create linkage between local farmers' innovation capacities with scientific research and to lay out a common action plan to facilitate and achieve this linkage
5. To identify farmer innovations needing further research and improvement out of the presented FFS innovation work and the work of individual innovative farmers.



***FFS representatives presenting their innovations***

**Supporting ten innovative individuals.** Many community members are striving to improve their livelihood status even if various challenges are there in human life. They clearly understand their environment and can respond challenges according to what they sense. Hence, a number of innovative individual farmers have emerged with ideas that contribute to poverty reduction. Local farmers take the lead in exploring

their mind to respond to various changes and become innovative. Farmers are currently doing local research both individually and in groups. However, they have faced many problems while doing this. Supporting innovative individuals and groups is vital to promote local innovation. Taking this into consideration, ABSHCBDA provided material and financial support for innovative individuals and groups by organising an award programme in 2014 at district level.

#### **Award programme to support innovative individual/farmers**

The aim of the Innovative Farmers Award Programme at Mertulemariam town in Enebse Sar Midir District on 18 November was to give recognition and motivation to innovative farmers and support them, which in turn would stimulate other farmers to be innovative. It is known that every person by nature needs recognition for the activity s/he has been doing. ABSHCBDA therefore organised the award programme.

A total of 18 (1 female) innovative farmers were selected from 17 subdistricts in Enebse Sar Midi District and were invited to attend the award programme. Five experts from Enebse Sar Midir District Government offices (Agricultural and Rural Development Office; Women, Children and Youth Affairs Office; Mertulemariam Agricultural College; Finance and Economic Development Office) were selected to lead the award programme. They were assigned as judges, with the responsibility to identify the most innovative of the 18 innovative farmers. The experts came from multiple disciplines and had practical experience in farmer innovation.

All 18 innovative farmers are invited to present their innovative work and the judges set out clear criteria to select the ten best innovations and to award the ten most innovative farmers. The following were the major criteria set by the judges to select the innovations:

1. Is the innovation new or not?
2. Added value of the innovation?
3. Is the innovation done using locally available material?
4. Probability that the innovation can be scaled out
5. Absence of negative impact on environment (environmentally friendly Innovation).

After critical evaluation of the innovations presented by the farmers, a total of 10 innovative farmers (including one woman) were selected who fulfilled the above criteria and were given financial awards by ABSHCBDA. The awards were at different rates starting with 1350 Birr for No. 1 and going down by 50 birr for each subsequent award. The innovative farmers who were given financial awards for their innovation are the following:

1. Mr Setegn Chekol irrigation channel across a long terrain (1350 Birr)
2. Mr Mengist Demeke plough part made of metal instead of wood (to reduce deforestation)
3. Mrs Etye Yibeltal traditional house furniture
4. Mr Asegie Assefa changing unproductive into productive bees
5. Mr Yitay Yalew modified beehive
6. Mr Birhanu Ayele rat-control instrument
7. Mr Tadese Workiye silt sedimentation technique
8. Mr Bamlie Abtie utilisation of Irrigation system
9. Mr Tadege Asinakew wood-saving stove made from locally available material
10. Mr Abye Demeke utilisation of compost (900 Birr).

## **4 Capacity building**

### **4.1 Training for farmers and local experts in PID in Axum area: Axum, 6–7 August 2014**

The aim of this training was to train individuals from civil society organisations (CSOs) and organisations related to farming to help them identify and document local innovations and to practise and promote PID with farmers. It was implemented in collaboration with Aksum University and TM/LM District Agricultural Offices. There were 47 males and 7 female or a total of 54 participants.

PE partner organisations and farmers involved in CLIC–SR conducted participatory problem identification at the community level. We realised that our precious honeybees are in decline. Farmers and researchers regard this a big threat posed by intensification in land-use, distance to food and water sources, pests, diseases, inappropriate use of agrochemicals and climate change, to mention a few. Moreover, because of knowledge gaps in Ethiopia on the substantial pollination roles of honeybees, lower priority is given to honeybee issues in development initiatives. But honeybees are globally known as potential pollinators due to their unique characteristics and nature of their hairy bodies, which easily grasp pollen and convey it among flowers. The bees need a huge amount of nectar and pollen to feed their young.

#### **4.2 Two-day training of community groups to strengthen local adaptation capacity for CCA in Alemberhan + Capacity building for CSOs and implementing organisations + Training CSOs and local governments in PID and CCA developments**

ABSHCBDA organised a two-day training on PID and climate change with the aim of strengthening the capacity of farmers to develop local innovations, solve different problems by themselves and reduce climate change effects through adaptation mechanisms. The 100 participants (15 female) included community members and staff from CSOs and local government offices.



*Some of the participants in ABSHCBDA training in Mertulemariam*

## **II. MAIN ACTIVITIES ACCOMPLISHED IN 2015**

### **1. Escaping poverty through implementing Participatory Innovation Development in Axum area, 18–19 March 2015**

The purpose of the training was to support the poorest of the poor on how to get out of poverty by implementing Participatory Innovation Development (PID). Selected innovator farmers from Tahtai Maichew (TM) were used in the PID training process as mentors for this piloting. They trained the beneficiaries based on their experience on how they can go out of poverty. The training was conducted in the rural reality, where people can give appreciation to the rural setting rather than the expensive meeting halls, which are far and full of protocol.

At the beginning, the discussion was on what is poverty. The social aspect of poverty is having nothing at home or at hand to eat and use. This is the reality of many people and is more or less a direct reflection of dependency. They look for support in cash or in kind from government or donors.

Participants were divided into two groups and sent to observe the reality of the participants of this training. After this direct observation, some of the families were found to be having either irrigated or irrigable land. They planted different types of fruit trees but gave them less attention.

This was the focus of the training. All except two participants have their own farmland, but there are examples where people can be rich without owning farmland. To be healthy is enough to go out of poverty.

Some of the female-headed families are married but their husbands migrated elsewhere as daily labourers, leaving their good farms behind. The reason identified was that they did not have peaceful life at home. Therefore, as the subdistrict chairman said, it is poverty of behaviour in handling their relationship.

The final agreement was that innovator farmers volunteered to serve as advisers and/or mentors. A committee of five people was established to study and propose the next step. The members are:

- i. Gebremariam Meles, subdistrict chairman
- ii. Birhin Zegeye, female farmer
- iii. Brha Tadesse, female farmer and member of the Tigray Regional Parliament
- iv. Hailu Legesse, district agricultural expert
- v. Dawit Gebregiorgis, development agent.

They will identify the basic ideas, which do not insist or make beneficiaries dependent.

There were 25 participants in the training: 14 were beneficiaries, the so-called poor, i.e. 11 female and 3 male. The rest were innovator farmers, subdistrict administration and development agents. The final thinking is to use local innovation and PID in order to support them to go out of poverty.

### **2. Experience-sharing visit by farmers and experts to teff adaptation trial through irrigation in Axum area, 20–21 March 2015**

In order to increase teff productivity, various attempts were made using conventional, organic and ecological agronomic management techniques and practices. Different institutions and stakeholders recommend different agronomic practices so that it enhances the productivity of cereal crops.

The PROLINNOVA–Ethiopia Axum platform is in this initiative to conduct a joint experiment. As part of the research, different teff varieties had been released at national level and each respective research centre has studied the adaptability and productivity of the released varieties. Kora, Tsedey, Boset and Quncho emerged as varieties that are well adapted and their yield is stable in the Axum mandate area. Nevertheless, availability of the seed of these varieties (except Quncho) is very limited, so the farmers agreed to grow the varieties in their farms in the small-scale irrigation scheme in Aksum area.

The Axum Agricultural Research Centre supplied inputs (seed, fertiliser, poultry manure) for four farmers. Each farmer has four variety of teff and the management practice is as usual of the rainfed agriculture. In a joint experiment, Kora performed well using poultry manure.

Four districts took part involving 34 participants (6 female) in an experience-sharing visit. The Zonal Administrator (Michele Abreha) and Tigray TV people also joined. The Zonal Administrator was very impressed with the results of the irrigated teff and the idea of involving farmers in the experimentation. Visitors from the Agricultural Office and advisers of the Zonal Administrator were happy to know how much farmers are truly involved. Their true participation will help in the extension service.

### **3. Public lecture by woman farmer innovator**

Haregu Gobeza of Rama presented her innovation in the Agriculture Faculty of Mekelle University on 9 January 2015. Participants were university staff and students. Her experience was how she amended saline soil and striga weed by applying the desmodium plant. This plant had initially been used for animal feed but later she realised how the soil was improved and pests and disease disappeared. She provides evidence how innovator farmers build their confidence to present their experience. Moreover, she broke the bias in any academic institution that public lectures can be only by scientists and other formally educated people.



*Haregu during her presentation in Mekelle University*

### **4. International Farmer Innovation Day**

The International Farmer Innovation Day was celebrated on 12 December 2015. The meeting was organised in Addis Ababa for participants from different organisations. There were two presentations:

- The contribution of farmers to increase food production and soil fertility: example of biofertiliser
- Chicken sex determination by egg shape.

The presentations were followed by heated discussion. Participants suggested organising meetings and sharing experiences from our farmers because it will help us to know and appreciate our farmers.

### **5. Conduct joint experimentation and dissemination**

#### **i. Farmers' experimentation: sex identification of chicks by egg shape**

This experimentation is spreading very widely. It is being tried out by more than 60 farmers, mostly women. Farmers already started planning the breed and sex of chicks they want depending on the season.

#### **ii. The impact of honeybee pollinators**

This experiment was conducted in onion production with three treatments (with honeybee pollination, open pollination, without any pollinators) in four plots. However, the experiment failed because of shortage of rainfall. The drought in Ethiopia has had a great influence.

#### **iii. Adaptation season determination of planting *shibaka* cuttings**

The purpose is to increase vegetation cover and animal feed through using cuttings of a particular tree called *shibaka* (*Ficus thonningii* Blume).

**Table 2: Experiment with germination of *shibaka* by cuttings**

No.	Farmer	Sex	Date*	Location District / Subdistrict	No. of cuttings		Remarks
					Planted	Survived	
1	Abadi Berhe	M	10/10/2007	TM / Mai Siye	15	10 (67%)	
2	Fiseha Sibhatu	F	10/10/2007	TM / Mai Siye	10	9 (90%)	
3	Miesho Asgedom	M	15/10/2007	TM / Mai Siye	5	3 (60%)	
4	Birha Tadesse	F	10/10/2007	TM / Mai Siye	6	6 (100%)	
5	Gidey Hagos	M	08/10/2007	TM / Hadush Adi	20	19 (95%)	
6	4 persons	-		TM / Mai Siye	20	16 (80%)	Expansion
	<b>Total / average</b>				<b>76</b>	<b>63 (83%)</b>	

\* Dates are given according to the Ethiopian calendar, which is about 7–8 years behind the Western calendar.

## 6. Policy dialogue

Three policy-dialogue sessions were conducted in three locations as “Constructive Dialogues on Mainstreaming PID in National Policies and Programmes”.

### i. Mekelle

Tigray was the home of the ISWC (Indigenous Soil & Water Conservation) project, which was the mother of the PE initiative and was implemented by Mekelle University and the Tigray Regional Bureau of Agriculture. Therefore, this meeting in the region meant revitalising the idea of innovation among the participants.

The event aimed to bring rural farmers together with local government agencies, non-governmental organisations (NGOs), researchers, and staff and students from Mekelle and Aksum Universities, to share experiences. Equally important, it sought to stimulate researchers to make complementary efforts in filling gaps in farmers’ improvements through practising scientific research under the PROLINNOVA umbrella, including CLIC–SR, as a multi-donor initiative to promoting local innovation and creativity in rural areas.



**Partial view of participants in the policy-dialogue workshop in Mekelle**

Different presentations about historical and practical experiences were presented. Many of the presentations were of farmers’ experiences:

- One very impressive presentation was by the woman who made “the impossible possible”: Haregu Gobeza from Rama. She ventured with a small plot of long-unused stony and gravel and to make it arable and productive. She tirelessly transported and dumped large packs of fertile soil from other spots to enhance the fertility and productivity of the land. After less than ten years of such efforts, she now has more than Birr 23 million capital and assets.

- Brha Tadesse, 41 years old and Tigray Regional Parliament member from TM, shared her experience in identifying chick sex according to egg shape. She is also sharing this with her community so that farmers can hatch selectively for holidays, when there is a big market for cocks.



*Brha sharing her experience in identifying chick sex through egg shape and one participant trying it out*

- Kiros WoldeGebriel from Kiltе Awlalo District has developed an innovative fruit-harvesting tool.



*Kiros (left) demonstrating his fruit-harvesting tool, assisted by staff from Mekelle University*

**The way forward:** Participants proposed that PROLINNOVA–Ethiopia:

- strongly involve farmers and development agents;
- gather, organise publish and distribute local innovations to all parts of the country
- establish a strong network and partnership with CSOs, higher learning institutions and policymakers;
- encourage local government agencies to provide training and capacity-building opportunities for development agents who work closely with farmers;
- encourage policymakers to physically visit innovators.

The total participants were 59 in number, of which 6 were female. The organisations involved were the following: **Academic institutions:** Mekelle University (Department of Land Resource Management and Environmental Protection staff and students), Addis Ababa University, Axum University, Maychew TVET (Technical and Vocational Education and Training) College, Wukro TVET, Wukro St Mary’s College and Mehoni Agricultural Research Centre; **Government offices:** Tigray Region Bureau of Agriculture and Natural Resources, Regional Bureau of Women’s Affairs and Tigray Agricultural Marketing Agency; **Bilateral development project:** GIZ–SLM (German Agency for International Cooperation Sustainable Land Management); **NGOs:** Helvetas–Ethiopia, Institute for Sustainable Development, BPA and Poverty Action Network in Ethiopia (PANE); **Media:** TPLF Radio (DWET) and Ethiopian News Agency.

## ii. Bahir Dar

A CLIC–SR policy-dialogue workshop was held in Bahir Dar in Amhara Region on 10 January 2015. It was attended by 55 persons (including two women) from regional, zonal and district high-level government bodies, Bahir University, Adet Agricultural Research Centre, Debre Markos University, Mertulemariam Agricultural College, the Regional Agriculture Bureau and CLIC–SR innovative farmers.

Farmers' exemplary innovations were presented. These were:

- i. Mr Setegn Checol, hero of the river gorge: he has completely transformed his life on account of his innovation of conveying water over the river gorge to use for irrigation purposes, based on his own creativity;
- ii. Mr Yitayal Yalew, modifier of existing beehives: he gained high honey yields by modifying the existing beehives, designing some innovative structures into them;
- iii. Mr Abere Yirga, designer of a grain-sowing device: he designed this device from a plastic bottle with which he can disperse seed, DAP and urea simultaneously;
- iv. Mrs Etiye Yibeltal, local artist in making household furniture: she demonstrated her talents in artistic painting and crafting household furniture;
- v. Mr Andarge Yigrem, making light from weed: he is able to extract oil from the seed of an aggressive weed. The fuel has become the source of light for his household. Andarge has continued experimenting with the oil so as to use it also in food.

In the plenary session, participants raised many issues based on the presentations made. The discussion focused mainly on how to further promote PID. Overall, the workshop was considered vital in informing regional actors about how farmer innovation works. As a result, some important decisions that will reinforce the efforts of PROLINNOVA were identified, such as starting a new updating forum for individuals and organisations, including media, in order to identify, document and disseminate local innovations.



*Some of the policy-dialogue workshop participants, Addis Amba Hotel, Bahir Dar*

### iii. Addis Ababa

In April 2015, PE held a national workshop in Addis Ababa to share the results of the CLIC–SR project with relevant organisations that could have the capacity and interest to take some of the ideas forward. Presentations by farmer innovators from the CLIC–SR project areas, using photos, posters and models, played a great role in influencing other participants who were not used to seeing farmers speaking in such a high-level meeting. PE’s experiences in the last 10 years were presented, as was a review made as part of the CLIC–SR project into policy related to farmer-led research and development. The participants in the dialogue agreed that, in order to influence policy and practice throughout the country, PE should work more closely with the Ministry of Science and Technology and the increasing number of universities in Ethiopia, in addition to the conventional partners such as agricultural research and extension agencies. The national dialogue was attended by 24 persons, including one woman. The proceedings can be found [here](#). A policy brief that was prepared for the dialogues at regional and national level can be found [here](#).

## 7. IPW2015 – The PROLINNOVA International Partners Workshop

The International Partners Workshop (IPW) 2015 was held in Axum, Ethiopia, on 27–30 April 2015. It was hosted by PANE (Poverty Action Network Ethiopia) and implemented by BPA. The IPW brings together people from the PROLINNOVA Country Platforms (CPs), International Support Team (IST), International Secretariat and the PROLINNOVA Oversight Group (POG) to review progress made during the past year and to share and learn from each other. The IPW 2015 included discussions on and sharing of experiences from two regional projects – Local Innovation and Experimentation: an entry point for Climate-Change Adaptation (LINEX–CCA) in Asia and Combining Local Innovative Capacity with Scientific Research (CLIC–SR) in Eastern Africa – and from three CPs from West Africa: Burkina Faso, Mali and Senegal.

The CPs involved in CLIC–SR (Ethiopia, Kenya, Tanzania and Uganda) had a 2-day meeting on 25–26 April immediately before the IPW. The POG met on 26 April to discuss governance issues, funding opportunities and the search for a new host for the International Secretariat. The results of the CLIC–SR and POG meetings were shared at the IPW.

## 8. Enhancing capacity of farmers in information and communication

BPA promote different information and communication means. The most important are:

- i. Facebook and website of BPA: farmers are trained and able to document photos and video films on the spot. They are invited to upload photos on the Facebook page with the help of experts in the Tahtai Maichew agricultural office, but uploading films is difficult because it requires time and a good Internet connection. However, this website is not actively used.
- ii. A quarterly magazine called *The Bees* in English, now changed into a Tigrigna version for wider public use.
- iii. A relay-type cellphone messages delivery system (SMS) to key contacts: a person sends information about local innovation, new ideas and impressive results from farmers’ experimentation to 100 first-level recipients; each of them sends this to 10 second-level recipients, each of whom sends it to 5 third-level recipients. These are expected to share with their neighbours, maybe 10 people, who will the share with a minimum of two more people orally. All together, if this works, the information will be reaching 100,000 people.

## 9. Lessons learned

The following lessons were drawn from the CLIC–SR project, which is currently the major activity being implemented by the PE network:

1. We can notice that smallholder farmers are the source of many innovations.
2. Many farmers’ innovations are vital to increase production and productivity.
3. There are a lot of local farmer innovations with great socio-economic value that are not documented for scaling out.
4. Informal experience sharing is happening among innovators and other community members.

5. Local experimentation is part of the everyday life of farmers, and other stakeholders can join any time, which can help the farmers in documentation, as this is a gap.
6. Sometimes farmers could not perceive their own innovations even if they solve their problems in their day-to-day life.
7. Capacity-building workshops help in energising different groups to know each other, to work together and to respect each other.

## **10. Final remarks**

During the reporting period, the PE network was in transition from being hosted by one organisation (Poverty Action Network Ethiopian: PANE) to a new host. At the same time, for formal reasons requested by PANE, which regarded the PE activities (primarily CLIC–SR) only as a project, the National Steering Committee (NSC) had to change its name to the Technical Advisory Group (TAG). However, there was no change in the internal backstopping role played by this small group.

The CLIC-SR project was very important in moving PE forward. This project helped PE to be active in two locations, each in a different region (Tigray and Amhara). It allowed policy dialogues to be held in these two regions and at national level in Addis Ababa. In late 2015, it was finally decided that PE will be hosted by BPA. In 2016, the TAG will prepare a national CLIC-SR project evaluation meeting. In the meantime, it will help PE restructure itself and strengthen its multistakeholder platform, which will discuss the way forward.