

PIP Module 3

Creation of Integrated Plot Plans (IPPs) with PIs

A guide for the training-of-trainers (Innovative Farmers - PIs) on IPP creation and the integration of crop and land management practices



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1. INTRODUCTION

Land management is a very important pillar of the PIP approach. Environmental problems, particularly land degradation in the form of soil erosion and nutrient losses, are serious impediments to agricultural productivity and sustainable development in general, and must therefore be addressed at all stages of implementation of the PIP approach.

In Module 1 of the PIP approach, various participatory sessions have been organised in the PIP villages, with the aim to raise the population's awareness about these environmental issues and their effects on (the quality of) life in a village. In addition, in Module 2, innovative farmers (PIs), selected by the community, were trained to design their PIPs by adopting an integrated vision and plan for the next 3 to 5 years, with sustainable land management as one of the key components. Throughout the PIP training and before closing the final PIP training session, the PIP trainer emphasises that activities related to soil restoration and conservation are a priority, as a healthy soil is the foundation of all other agricultural activities.

During the inventory of training and other needs carried out at the last training session on PIP creation in Module 2, the facilitator discussed the requirements among PIs for capacity building on the “best practices” for increasing the productivity of the land in a sustainable way, as well as a training on how to create a plan to integrate these practices on a specific plot of each PIP farmer. The latter is what we call the **Integrated Plot Plan** (IPP). Thus, this Module 3 on the IPP follows directly after the 9 training sessions on PIP creation with the PIs in Module 2. IPP creation is initially done with the PIs, and later scaled-out to next generations of PIP farmers through the PIs right after the first PIP competition.

*An IPP or **Integrated Plot Plan** is a plan of activities, in addition to the household PIP, to be carried out on a specific plot, for a period of 2-3 years. The aim is to optimise the productivity of this plot in a sustainable way. The same philosophy and elements of PIP creation apply to IPP creation, i.e. working with a vision and a plan, as well as the 3 guiding principles of the PIP approach (integration, empowerment and collaboration), which are recurrent in all PIP activities.*

Creating an IPP is important for every PIP farmer, because it allows to start experimenting with different practices on 1 plot. An important aim is to integrate a combination of different practices – for instance soil erosion, soil fertility *and* crop management practices at the same time, and to learn what works best. Creating an IPP allows farmers to put in practice what they have learned, and what they continue learning, also from others. However, creating an IPP is particularly important for the PIs, given that they are the first in a village to be trained, and therefore they are often the best trained PIP farmers. Experimenting with different best practices on the IPP plot enables the PIs to enhance knowledge of these practices, which can then be extended to the whole farm and to other PIP farmers. The IPP plots of PIs can also serve as learning sites and demonstration plots for the whole village, because in the PI group there will be a diversity of best practice options, often on different kind of plots scattered throughout the village.

IPP creation is thus first done by the PIs (this Module 3), and scaled-out later at the time of the PIP competitions (Module 5), in the same way as PIP is extended to subsequent generations of PIP farmers. This Module 3 gives a step-by-step description of the training of PIs on the creation of IPPs, while the implementation of the planned practices is up to each PI, to be done according to his/her own means and time, but starting directly after IPP creation.

Important to note is that Module 3 is also closely connected to Module 4, which explains how “restoration sites” will be established in each community. On these restoration sites, which are identified in Module 1 during the development of the first Community Vision, the aim is to have several IPPs of PIs located there, and prioritize the scaling of IPP creation to all the other plots within a restoration site. This allows to quickly achieve (visible) impact and coordinate the implementation of permanent land management practices (e.g. trenches or stone bunds on the contour lines). Connecting IPPs on a degradation site is an essential element for the sustainability of all actions on these sites.

Key principles for best practice to be developed in IPPs

The best practices to be implemented on the IPPs are based on 5 key principles:

1. Capture water where it falls
2. Increase organic matter in the soil
3. Support life in the soil
4. Restore the nutrient balance
5. Optimize farming efficiency and sustainability

These principles should always be taken into account. They are further explained later in this Module 3.

Categories of best practice to be developed in the IPP

The practices to be planned for in an IPP fall into the following 5 categories:

- 1) Permanent land management (soil and water conservation) practices
- 2) Non-permanent land management (soil and water conservation) practices
- 3) Soil fertility management practices
- 4) Crop management practices
- 5) Other practices and innovations

The importance of these practices, and how to choose the best practices to integrate into an IPP, will be explained in Chapter 2 of this module.

To prepare trainings on IPPs, best practices and the problems of soil erosion and soil fertility management, it is important to use materials that farmers can understand. Some tools have already been produced in Burundi as part of the PAGRIS project (available in English): *a booklet, an image box and a video*. Organizations using this Module 3 can also use their own, or country-specific training materials and technical booklets, e.g. on good practices such as building trenches, compost making, mulching, planting living hedges etc.

Similar to the process of creating the PIP, it is important that the project staff and all the facilitators receive proper training in the process of developing IPPs, so that they are able to train and support farmers. We further recommend that staff always discusses each session of this Module 3 with each other before training the PIs, as such enriching each other with the best possible (participatory) methods to conduct each session.

After this introductory section, Module 3 consists of two main sections:

- Chapter 2 with a step-by-step description of the process of creating IPPs with PIs;
- Chapter 3 with an overview of technical trainings and mutual learning to implement IPPs.

2. STEP-BY-STEP CREATION OF INTEGRATED PLOT PLANS (IPPs)

As explained in the introductory section, during the PIP training in Module 2 the PIs are made aware about the importance of investing in best practices for increasing the productivity of their land. They are encouraged to start experimenting with this on one of their agricultural plots. Hence, immediately after PIP creation, the process of IPP creation starts. IPP creation follows 5 steps, covering 4 training sessions with the PIs and 1 step in which PIs will do the IPP creation at home with their family members:

STEP 1:	Raising awareness about soil problems and best practices (Session 1)
STEP 2:	Creating an IPP: how to assess your plot (Session 2)
STEP 3:	Creating an IPP: how to draw and plan your IPP (Session 3)
STEP 4:	Homework for the PIs: creating your own IPP
STEP 5:	Improving and finalizing the IPPs created by the PIs (Session 4)

As with the creation of PIPs, we propose that couples (or two household members where applicable) participate in the first day of the IPP training (the awareness-raising activities). During the other sessions, only the PIs will stay during the training sessions as the participation of couples would make the training group too large and difficult to manage, particularly during the group activities.

2.1 STEP 1 - Raising awareness about soil problems and best practices (Session 1)

Step 1 focuses on awareness raising. Awareness-raising is a key activity that recurs at every stage in the PIP approach, because the more awareness and open-mindedness there is about an issue, the more intrinsic motivation there will be to invest in the solution.

As part of the IPP creation, awareness-raising gives PIs a better understanding of the problem, and why it is important to integrate different (categories of) soil (fertility) management practices. This awareness-raising should be done using a variety of tools, to make it easier for them to understand: videos, image boxes and booklets that explain the issues and possible solutions in detail. Some of these materials are already available for this Module 3, but we encourage the use of other locally-specific materials, according to what is available and needed.

Step 1 consists of two parts:

- a. raising awareness about land degradation and soil related problems, and
- b. identifying possible best-practices for integrated soil (fertility) management

STEP 1a: Raising awareness about land degradation and soil related problems (2h)

- **Brainstorming on erosion and soil fertility problems, causes and consequences (30 mins)**

In the workshop, the facilitator and the PIs discuss and list all the specific problems observed or experienced on their own plots, which hamper agricultural productivity: *erosion, hard impermeable soils, signs of acidity, poor plant growth, etc....* Write down the list of problems on a flip chart.

After listing all the problems, the facilitator asks :

- What are the causes of these problems? What are the consequences? Record the answers on a flip chart.

- **Explain and discuss the soil related problems using a variety of materials (1h30-2h)**

To raise awareness about the causes of land degradation and soil related problems, the facilitator can use a variety of tools. If a (portable) beamer is available at the training location, we recommend to use the video made by the PAGRIS (IFDC) project in Burundi, called **“Principles of integrated and sustainable management of soil fertility in Burundi”**. The images of this video are also used in this Module 3 and in the technical booklet for farmers/trainees that accompanies this Module 3. Given that the video is spoken in French with English subtitles, we suggest that the facilitator pauses the video after short intervals, to explain the main message in that particular part in his/her own words (and in local language where needed!), to enhance the understanding by the PIs.

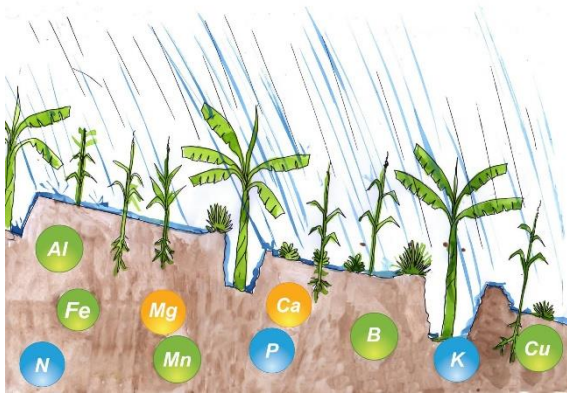
The video is available in .mp4 format and can be requested to the authors off this Module for use by your project. Once received we recommend that you download the video on your laptop for easy use in the field with the PIs.

The material conveyed by the video contains the following messages / topics:

- Soil is essential to life in the world;
- The soil forms over several years but is lost in a very short time if it is not protected;
- Various soil nutrients (macro, meso and micro-nutrients) are essential for plant growth;
- A healthy soil encourages the circulation of water and air, microbial life and root development in plants;
- On bare soil and slopes, erosion causes physical and chemical losses and acidifies the soil;
- Soils cultivated without rest (a fallow period) will become exhausted, because there is a loss of elements exported by the harvest which is often not sufficiently replaced;
- Good conservation and restoration practices are essential, such as returning to the soil what is lost (recycling residues, compost, fertiliser), covering the soil, growing crops perpendicular to the slope, intercropping, contour cultivation, interception of raindrops by plant leaves (reducing the force (kinetic energy) of the raindrops and encouraging infiltration into the soil);
- Protecting catchment areas or watersheds is important, everyone should participate and collaborate, so that the efforts of some are not undone by the lack of participation of others.

As mentioned, a technical booklet accompanies this Module 3 (also produced by the PAGRIS project in Burundi) which can be used to hand-out to the PIs. Images from this booklet are presented and explained on the following pages, but if the facilitator has other tools or materials these can also be used if they add value.

✓ *Awareness of soil formation and soil loss (20 mins)*



The facilitator asks the participants: What do you see in the pictures? *The answers indicate the soil, plants, soil nutrients, rain, water retention in the soil, etc.*

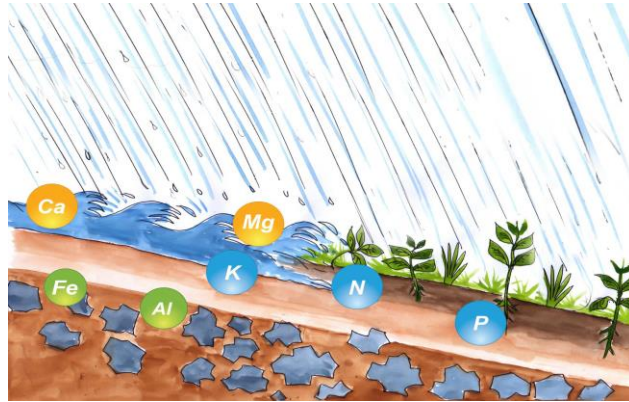
After gathering the participants' answers, the trainer explains that the soil is the upper part of the earth, where the roots find the nutrients and water essential for plant growth. Hence it is essential to preserve this thin layer of soil!

Then, using the explanatory messages in the training booklet, the facilitator explains the soil formation process (decomposition of rock and organic matter, etc.). The facilitator explains that in a forest environment, only 1mm of soil is formed each year.

The facilitator then asks the participants: *If this is the case, how many years does it take to produce a soil of about 20 cm in a forest environment?* The calculation shows that it takes around 200 years in a forest environment where there is enough organic matter to decompose. However, this figure is much higher for cultivated land with little organic matter. In Burundi, for example, experts estimate that in the highlands with steep slopes, around 1 cm of topsoil is lost every year (around 150 tonnes of land per hectare). Hence, 1 cm is lost every year, whereas it is only possible to produce a maximum of 1 mm per year! Moreover, if the topsoil on your fields consists of only 20 cm, this means that in 20 years it will be completely lost and plant growth is no longer possible.

The facilitator concludes that when soil is not well protected, it is lost much more quickly, whereas it takes a very long time to build up. It takes several hundred, even thousands of years to form a good soil, hence the importance of taking care of it!

✓ **Awareness of water erosion, one of the main causes of soil degradation (30 mins)**



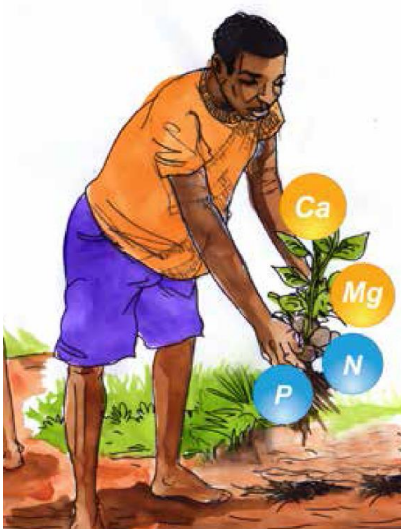
The facilitator asks: What do you see in this picture? Rainwater *carrying soil and nutrients, damaging crops, etc.* After gathering the participants' answers, the facilitator explains that when soil is bare and the land has a slope, there are 2 important processes that lead to soil loss and erosion:

- The force (kinetic energy) of the raindrops that loosens the soil particles and nutrients, especially on bare soils with low organic matter content this has a great impact
- The transport of soil by runoff water, which especially on steeper slopes can have a devastating effect because of the higher flow velocity of runoff

If acidification of the soil is an issue, the facilitator can also elaborate and explain that erosion by the runoff water carries away basic cations (Ca, Mg) and leaves behind elements like iron and aluminium, making the soil acidic.

The facilitator concludes by stressing that water erosion is the biggest factor in land degradation in the world in general, hence the importance of combating erosion on sloping land!

✓ **Awareness of the effects of over-exploitation of the land and failure to return exported elements (10 mins)**



The facilitator asks: What do you see in the picture? (*soil elements exported by the harvest*)

What are the consequences if you do this season after season without fallow period, giving the soil time to rest? (*gradual degradation through over-exploitation, etc.*)

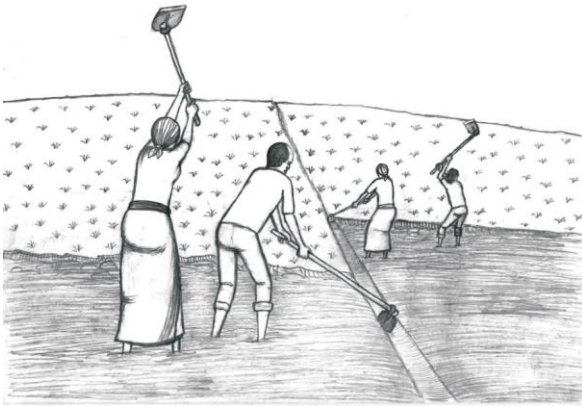
After gathering the responses of the participants, the facilitator concludes that the more the soil is cultivated without rest, the more it loses its nutritive elements, since these elements are exported with what is harvested, including residues. Hence the importance of returning to the soil what it has lost (*recycling residues, adding elements in the form of compost, organic manure, mineral fertiliser*) and fallowing if possible.

✓ **Awareness of the effects of poor farming practices (10 mins)**



The facilitator asks :

What can you see in this image? (*farmers ploughing downhill*)



The facilitator asks :

What can you see in this image? (*farmers digging up the boundaries of plots*)

After collecting the responses, the facilitator emphasises that poor farming practices cause land degradation: ploughing in the direction of the slope leads to erosion, with masses of earth moved down the slope. This can lead to rill and gully formation on this land (the facilitator can show pictures of eroded land with rills and gullies in the local context).

Furthermore, digging into the plot boundaries between the fields of different farmers also enhances erosion because if hedges are removed or absent, it might create a pathway in between the plot, on which water accumulates. The runoff water from these pathways eventually creates erosion gullies that gradually grow bigger.

The facilitator concludes by asking what other human activities have an impact on soil degradation (*overgrazing, tree cutting, bush fires, slash-and-burn agriculture, etc.*).

✓ **Awareness of the risk of bare soils (10 mins)**



The facilitator asks: What do you see in the picture? Bare soil, with the formation of rills and gullies. What could be causing the situation you see in this picture? (Lack of soil cover, enhancing water and wind erosion).

The facilitator explains that when the soil is left bare and not covered, water and wind erosion carry away soil and nutrients, and the soil becomes hard and impermeable to water and air due to the “washing” of the soil, making it unproductive. Hence the importance of keeping the soil covered (*through practices such as agroforestry, mulching, cover crops, intercropping, etc.*).

STEP 1B: Raising awareness of possible solutions (2 h)

After a wide-ranging discussion on the problems of degradation, the facilitator and participants discuss solutions.

- **Group work 1: Discussions on possible solutions (1 hour)**

The PIs discuss in groups the good practices they know of that could remedy the problems they have identified in the previous discussion and that they experience on their own land, and then present and discuss them in plenary. It is important to encourage everyone to have their say, because farmers' knowledge and experiences are very important for learning.

- **Additional information from the facilitator (1 hour)**

After the group work, the facilitator will provide additional information and lead discussions on the 5 categories of best practices, with examples. The facilitator can use tools such as the video, the image box or the booklet to facilitate the discussion and ask the farmers to classify the best practices they have already identified in the following 5 categories. They can also discuss if there are any other practices that they know of and that they can add.

1. Permanent practices



Examples

- Contour lines or trenches with herbaceous hedges (fanya ju and fanya chini)
- Mixed hedges and agroforestry trees (without trenches, just vegetation hedges)
- Stone lines or stone bunds on contour lines
- Correction of gullies using gully control barriers
- Maintenance of trails (that don't provoke erosion)
- Terraces (also individual terraces for trees)

2. Non-permanent practices



Examples

- Cultivation on ridges following contour lines;
- Ploughing following the contour lines;
- Use of organic fertiliser in sufficient quantities;
- Mulching ;
- Staggered planting ;
- Row or strip cropping, intercropping, etc.

3. Soil fertility management practices



Examples

- Use of manure
- Liming
- Composting
- Use of green manures (e.g. mucuna, Tithonia, etc.) ;
- Use of mineral fertilisers, etc.

4. Crop management practices



Examples

- Use of selected seeds (good seeds);
- Respecting adequate plant spacing;
- Good crop combinations: crops grown in rows or alternating strips, intercropping;
- Timely weeding, etc.

5. Other practices and innovations



Examples

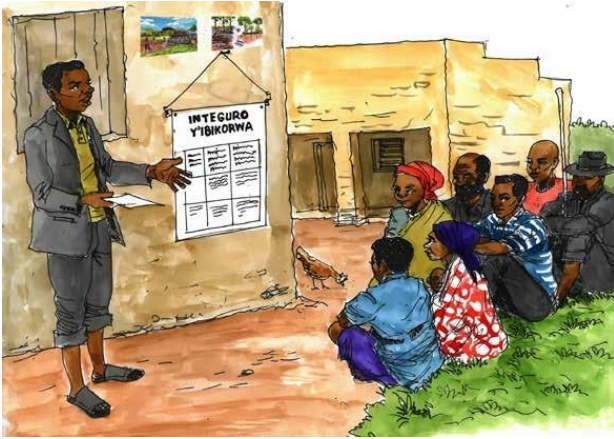
- Using alternative “soil covers” to avoid evaporation of water and drying of the soil (photo above);
- Improve the quality and quantity of compost by growing Calliandra and Tithonia and adding the leaves to the compost (photo below);
- Channeling water from rooftops into the banana garden;
- Cover the compost heap with climbing plants (e.g. producing fruits) that contribute to food nutrition and/or can be sold at the market;
- Production of nitrogen-rich fertilizer from urine.

- **Selection of an example plot on one of the PI’s farms (15 minutes)**

The PIs will learn in the next session how to create the IPP from an example at one of the PIs plots. It is therefore recommended to identify this example PI at the end of Session 1, preferably nearest to the venue where the workshop is given.

→ **The 1st session will take around 4 to 5 hours.**

2.2 STEP 2 – Creating an IPP: how to assess your plot (Session 2)



IPP creation uses the same philosophy as the PIP creation, i.e. **working with an integrated plan and vision**, developed as a family. Again the PIP guiding principles “empowerment, integration and collaboration” are crucial!

The activities covered by session 2 are as follows:

- a) Visit to and discussions on a plot of one of the PIs
- b) Choosing best practices using the 5 key principles
- c) SWOT analysis for IPP implementation

✓ Visit to and discussions on a plot of one of the PIs (1h)

The whole group gathers at the example plot of one of the PIs, where s/he plans to develop his/her IPP.

Drawing on discussions of Step 1, this PI works with the others to identify the problems (*e.g. erosion, low fertility, soil acidity, etc.*) that prevent good production on this plot. The problems vary depending on the agro-geographical zone, the topography, the type of plot, the type of crop, etc.

The following discussions can be held around the plot, in order to increase the awareness and motivation of the PI (20-30 mins):

- What factors hinder productivity on the plot, as observed or known? The group of PIs is encouraged to draw inspiration from the discussions that took place in Step 1, this time by analysing the real facts in the field;
- How was this productivity in previous years (*e.g. 20 years ago if possible*). To understand how the decline in fertility has evolved over time, the landowner can speak out, or the others who know this plot or similar plots can speak out;
- What are the causes of these problems?
- What are the future trends if nothing is done?

The next stage is a discussion of good farming practices that could improve the productivity of the plot visited (20-30 mins).

The facilitator and the PIs discuss possible best practices that could remedy the situation observed. They draw on the discussion in Step 1 about the categories of best practices to guide the discussion and make sure that diverse types of practices are considered (*i.e. from different categories, the more the better, because integration of practices in the IPP is very important!*).

✓ **Choosing best practices for the plot, using the 5 key principles (1h)**

This activity will take place back at the training site. In order to choose the best practices for an IPP, we use the 5 key principles and make sure that all of these are understood and considered. These should therefore first be discussed and explained by the facilitator, by using the Table below with examples of best practices under each key principle, as well as an explanation why each key principle is important (and of course the facilitator can add own examples of practices for the local context!):

1. **Capture rainwater where it falls**
2. **Increase soil organic matter**
3. **Support life in the soil**
4. **Restore the soil's nutrient balance**
5. **Optimize farming efficiency and sustainability**

Key Principles	Best practices	Why this key principle is important
Capture rainwater where it falls	Almost all soil and water conservation practices, anti-erosion techniques, practices that enhance soil cover, especially those on the contour lines (hedges, ploughing and cultivating on the contour line, etc.).	Avoiding run-off, avoiding that water starts flowing on a field or reduce the speed of the flowing water, retaining water where it falls and allowing it to infiltrate into the soil.
Increase soil organic matter	Agroforestry (trees and shrubs, grasses), soil cover crops, more compost/manure, high biomass plants such as <i>Tithonia diversifolia</i> , mulching, etc.	Improving the soil structure, facilitating the circulation of water and air in the soil, which will increase the soil's resistance to erosion and also support life in the soil (see next principles).
Support life in the soil	Reduce or eliminate soil tillage (ploughing), rational/limited use of pesticides, more compost/manure, soil cover, avoid burning, etc.	Not disturbing the soil (too much), allowing soil life to build "their home" and contribute to making the soil healthy, with an improved structure, good chemical composition and no toxic elements (e.g. from pesticides).
Restore the soil's nutrient balance	A number of practices are used to replenish soil nutrients and reduce their loss (improved fallow, residue management, compost, manure, recycling of residues, agroforestry, green manures, mineral fertilisers, etc.).	Supplying nutrients to the soil that are lost by erosion or crop cultivation, making sure that the original nutrient balance is restored, improving and maintaining soil fertility.
Optimize farming efficiency and sustainability	All the best agricultural practices: <i>liming, good seeds, crop rotation, sensible crop combinations, correct use of fertilisers and organic matter, protection of crops against disease, weeding, etc.</i>	Using agricultural practices that keep the soil healthy, are more efficient (reducing losses during farming, good pH levels), crops in synergy and good rotations, optimize farming, more sustainable and supporting soil health at any time.

Once the 5 key principles are discussed and well-understood by the PIs, the facilitator asks the PIs to classify all the best practice options discussed during the visit to the IPP plot under these 5 key principles. Similarly as how the “different categories of best practices” were used and discussed in the PI group, using the 5 key principles also aims to ensure that a diversity of practices is considered and planned in each IPP, as such achieving optimal integration and enhancing sustainability!

Please note that some best practices can respond to several principles at the same time: e.g. a mulch cover captures rainwater where it falls, increases soil organic matter and contributes to supporting life in the soil! Having such discussions in the PI group is a great learning experience and enhances the PIs awareness about the importance of integration and the (often multiple) benefits of certain practices. It is the role of the facilitator to prepare this session well, ideally with his/her colleagues, making sure to be able to give good examples and master this discussion!

Please take note!

It is important to remind PIs that practices such as trenches (fanya ju and fanya chini) need to be carried out with care, as they can present risks when applied in isolation and/or without respecting standards. So, we recommend that during IPP creation the PIs intend to already start designing trenches with their neighbours, especially on steep slopes where accumulation of water in trenches that do not drain properly to a natural water course poses a risk of flooding and erosion. Among other things, the following advice can be given to PIs:

- As far as possible, choose an IPP plot that does not suffer from runoff coming from upstream (hence from another plot or area where no practices are implemented, so better to choose a plot in the upper part of the slope, or on a moderate slope);
- Start with erosion control practices on the contour line, preferably with vegetative hedges, plant barriers or stone lines, at a **distance trenches that respects the slope**;
- If necessary, discuss with upstream and downstream neighbours and agree on practices to be implemented to reduce runoff;
- When building trenches where water could collect, ensure that the water can be safely drained off into a natural watercourse;
- Incorporate other practices in the field to improve water infiltration and reduce water run-off (always consider the 5 key principles explained above!);
- Discuss the design of the IPP with project staff, extension services or experienced PIs for exchange of ideas and further input.

✓ **SWOT analysis for IPP implementation (2hrs 30mins)**

Once the best practices for improving plot productivity have been identified, farmers identify their strengths, weaknesses, opportunities and threats to see what assets they can capitalise on and what limitations they need to overcome to implement these practices. The SWOT analysis is a tool for farmers to assess whether their objectives to implement the best practices are achievable. For ease of use, the SWOT analysis will focus only on the essential strengths & weaknesses (internal) and opportunities & threats (external) for implementing each of the practices identified.

- ✓ First, an example is elaborated for the PI who was visited (**1 hour**). This is done in the plenary with all PIs, and after this session the example PI will improve on the SWOT analysis done in the workshop with the members of his family at home.
- ✓ Next, a group exercise is given to all the PIs to simulate a SWOT analysis of one of their plots in group of 5-6 PIs. The exercise takes about **45 minutes**, after which a **45-minute** plenary session follows. As the group is made up of 25-30 PIs, they can work in 5 groups.
- ➔ To save time, when the group is tired or seems to understand the SWOT analysis well, this last group exercise can be skipped or shortened, e.g. by cutting the plenary session. Experience shows however that practicing with the SWOT analysis is often needed and good to do!

To guide them, farmers are encouraged to look at the **economic aspects** (e.g. access to seeds, fertilisers, finance, etc.), **social aspects** (e.g. family and community spirit of collaboration, leadership, governance, etc.), **environmental aspects** (e.g. biophysical conditions such as soil, biomass, climate, topography, etc.) and **technological aspects** (e.g. mastery of techniques, etc.) of each practice as they carry out their SWOT analysis.

Examples of strengths, weaknesses, opportunities and threats in a SWOT analysis for an IPP

Key principles	Possible practices	(possible) Strengths	(possible) Weakness	(possible) Opportunities	(possible) Threats
Capture water where it falls	Trenches with living hedges, cover crops, stone bunds, mulching.	<ul style="list-style-type: none"> • Tools available • Shards of Bana grass available • Family workforce • Favourable topography 	<ul style="list-style-type: none"> • No knowledge about contour lines • Unavailability of biomass in the field for mulching • No stones available 	<ul style="list-style-type: none"> • Experience in community work • Agroforestry plants available for living hedges • Biomass/mulch in the surrounding area 	Neighbours' goats graze on the hedges along the contour lines
Increase organic matter	Manure/compost, agroforestry, soil cover crops, high biomass plants e.g Tithonia), mulching.	<ul style="list-style-type: none"> • Goat manure • Labour to make compost 	<ul style="list-style-type: none"> • Low availability of biomass in our field to increase the compost • No tree seedlings for agroforestry 	<ul style="list-style-type: none"> • Availability of Tithonia cuttings in the neighbourhood • Availability of mulch in public areas 	Bush fires

Support life in the soil	Reasoned use of pesticides, apply compost/manure, avoid burning, no tillage of the soil	<ul style="list-style-type: none"> • Manure available • Knowledge of biopesticides 	<ul style="list-style-type: none"> • No knowledge of no-tillage • Poor knowledge of fertiliser dosage (leading to overuse) 	<ul style="list-style-type: none"> • Bio-pesticides applied in adjacent villages • A new law against bush fires 	Demographic pressure on land
Restore the soil's nutrient balance	Recycling residues, improved fallow, compost, manure, agroforestry, green manures, mineral fertilisers, etc.	<ul style="list-style-type: none"> • Mucuna seeds • Funds for the purchase of 50 kg of fertiliser 	<ul style="list-style-type: none"> • Small farm size for fallowing • Insufficient funds to purchase the necessary 100 kg of fertiliser 	<ul style="list-style-type: none"> • VSLA where we can borrow money to buy extra fertiliser 	Low availability of fertilisers on time
Optimize farming efficiency and sustainability	Liming, good seeds, good crop rotations, protection against disease	<ul style="list-style-type: none"> • Money to buy 50 kg of lime • Some knowledge about seed selection 	<ul style="list-style-type: none"> • Insufficient funds to buy the necessary 100 kg of lime • Poor knowledge of crop rotation 	<ul style="list-style-type: none"> • Low availability of quality seeds 	Prevalence of potato bacterial blight in our area

➔ The 2nd session closes after the SWOT analysis and lasts around 5 hours.

2.3 STEP 3 – Creating an IPP: how to draw and plan your IPP (Session 3)

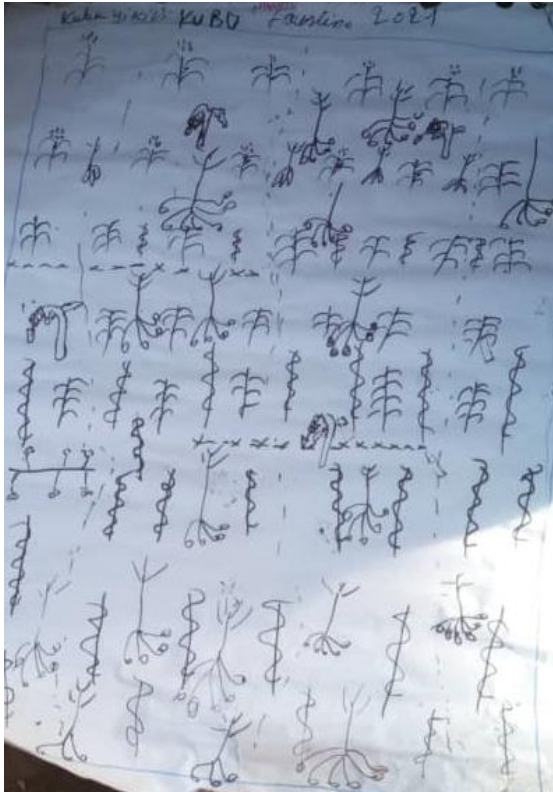
As with the creation of PIPs at household level, visualising positive changes and defining a timetable of steps to be taken to achieve these changes is essential to generate intrinsic motivation for action. Over the course of this 3rd session, the PIs will go through the following training activities:

- a) Discuss and draw the current situation of the plot
- b) Discuss and design the future situation of the plot
- c) Drawing up a plot action plan

✓ Discuss and draw the current situation of the plot (30 minutes)

Given that the PIs have visited the example (IPP) plot of one of the PIs and know the state of this plot, they start by drawing the current situation of this example plot. First, they discuss together: *what problems were observed on the plot (state of the crops, state of the soil, signs of erosion, other signs of degradation, etc.)?*

The PIs join the same 5 groups as in Session 2 and are asked to draw the current situation of the plot that was visited. It is important that the identified challenges are clearly visible in the drawing to differentiate it from the future drawing that will be made afterwards. Please find below find an example from a PI from Burundi.



Explanation of the photo of the current drawing of a plot

The image shows the current situation drawn by the household of a PI.

The photo shows an unprotected plot, with visible erosion gullies, crops in poor condition and little application of best practices (planting along the slope, lack of anti-erosion measures, etc.).

IPP creation was also done in Burundi with students from a TVET. Instead of making a drawing the students chose to take a photo of the current situation and print it out. In this way, each time they compare the changes they have achieved by implementing their IPPs with the initial photo, and they say that this motivates them because they can clearly see the changes.

This photo clearly shows presence of *Pteridium aquilinum* on the plot, which is an indicator of acid soils in Burundi.



✓ Discuss and design the future situation (2h)

After finalising the current drawing, the work continues in the same groups (of 5-6 PIs) to draw the future situation (for 2-3 years) considering the best possible practice options that were discussed and chosen by the PI in Session 2 (1 h). If any new relevant ideas emerge during the discussion, they can be added. The group working with the example PI as a group member works on a real case that the PI in question will improve by discussing with the members of his family. The other groups carry out the simulation for the plot visited (they can be more creative and work with more assumptions, but of course, since they have all visited the plot, also their simulations will come close to what is possible and most desirable for the visited PI and his plot).

After this exercise, the different groups will discuss their future situations in plenary (45 mins). These discussions will also help the example PI to gain ideas from the other groups to refine the design of his plot. And the others will also learn from this example how to do it for their own IPPs.

Some hints that may help the drawing of the future situation: farmers show the changes they want to achieve in the plot over a period of 2 to 3 years, by applying the best practices to improve the plot's productivity and sustainability. These changes are illustrated in different drawing next to each other (see figure below as an example), covering the different seasons as follows:

- **Permanent practices** (contour lines, living hedges, agroforestry trees, stone bunds, etc.) are drawn first and are illustrated over all the seasons (since they will be put in place, or some practices may exist already), as they are not going to change.
- **Crops or practices that occupy the plot for more than one season** are drawn for all seasons of occupation (e.g. cover crops such as mucuna, certain intercrops such as cassava last for more than one season, etc.).
- **The practices to be implemented over the course of the different seasons** are outlined in the season in question (rotations, intercropping, cover crops, cultivation on ridges, staggered rows, etc.).

- **The shape of the plot remains the same throughout the seasons**, only the changes are noticeable;

N.B. Some good practices are not easy to draw up (e.g. application of lime, organic matter, etc.). These practices will be indicated on the action plan!

The figure on the next page shows the IPP vision for the future situation, extracted from an IPP plot which had serious soil fertility problems, covering for 4 seasons (seasons A-B 2022, and seasons A-B 2023).

Another example of the current and future situation of an IPP is given in Appendix 3.

✓ **Discussing and drawing up the IPP action plan (2h-2h30)**

After drawing and presenting the future situation of the example IPP, the PIs will work together again to write down the IPP action plan in the plenary. As with the SWOT analysis, the group compiles an example for the plot of the selected PI, with help from the facilitator **(45 mins)**.

The action plan indicates :

- The crop rotation plan for the next 4-6 seasons
- The right crop combinations for each season
- Best practices for each of the next 4-6 seasons

The action plan also makes it possible to highlight practices that are not easy to identify on the IPP (liming, application of fertilisers, etc.).

Next, the PIs will carry out a simulation exercise in groups **(45 mins)**, and then present the exercise in plenary **(45 mins)**. These groups are the same as in Session (SWOT analysis) and do the simulation for the same plot!




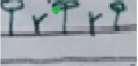




➔ *To save time, when the group is tired or seems to understand well, this group exercise can be skipped or shortened, e.g. by cutting the plenary session. Also here experience shows that the more the PIs practice the more they will remember and do this same exercise better at home!*

The table in Appendix 1 gives an example of a 4-season action plan from the IPP presented on the previous page, as well as two other examples from Burundi.

➔ **The 3rd session lasts approximately 4.30 hours**



LEGENDE

-  Maize
-  Potatoes
-  Cassava
-  Trench on contour line with Banna grass and Calliandra
-  Beans
-  Banana planted in holes
-  Lines of sweet potatoes with soya
-  Soya on the contour line

2.4 STEP 4 – Homework for the PIs: creating your own IPP (1 week)

The creation of the IPP at home follows the same activities as learned from the example given in the training, but this time with the involvement of all the members of the household, as in the case of the PIP. Even the PI who served as an example will repeat the exercise with members of his family to take account of their ideas. The work can generally be done within one week.

As the couples' participation took place on the first training day, the spouse also participates in this awareness-raising by sharing what he or she has learned with the other members of the household. The PI will guide the development of the IPP as a family and will ensure that all members of the household contribute.

At home, the following points are discussed by the members of the household:

1. **Importance of an IPP:** The household members discuss first about importance of using different good practices in a plot, with the IPP becoming a reference plot where the family aims to sustainably improve productivity, with a view to extending the lessons to the rest of the farm. Once all household members have understood the importance of the IPP and integration of practices, they choose the IPP plot where they will try out the good practices.
2. **Identification of problems:** As was done during the training, the members of the household visit the chosen plot and discuss the problems and limiting factors that prevent good production and how these have changed over time. This is also an opportunity for the PI (and his/her spouse) to share their knowledge of factors that may go unnoticed by members of the household, since they did not participate in the training. .

Example of cases observed in the PAGRIS/Burundi project

In Burundi, some members of households were not aware of certain factors, such as the problem of soil acidity and the importance of organic matter in the soil, and considered the lack of access to chemical fertilisers to be the main factor limiting the productivity of their plots. This was an opportunity for the PI to raise awareness in the household by sharing the knowledge gained in the workshop.

3. **Formulation of best-practice options:** After sharing their views on the key problems on the plot, the members of the household discuss the possible options for remedying them. The PI begins by explaining the different practices learned in training, in the 5 categories and considering the 5 key principles, which can remedy the problem observed. They then discuss and draw up a list of practices to be developed on the plot, based on the factors identified and the specific needs of the plot.
4. **Drawing up a SWOT analysis:** As learnt in the training course, the PI explains the importance of the SWOT analysis, which is to assess whether the objectives they have set themselves in

terms of practices to be developed on the plot are achievable, in order to better guide their choices. As explained (during the training course), the SWOT analysis is carried out in a simplified and general way, by looking at the strengths and weaknesses (internal), and opportunities and threats (external) that they have to improve the productivity and for the sustainable conservation of their plot by applying a set of integrated good practices.

5. **Drawing the current and future situation of the plot and the plot's action plan:** The members of the household draw the current situation of the plot and its challenges, taking into account the limiting factors already discussed, then the future situation and the plan, taking into account the practices chosen to deal with these limiting factors, following the model used in the training. This is generally done by one of them, who has most talent for drawing, but with contributions from the others.

Experience in Burundi/PAGRIS project

In the PAGRIS project in Burundi, groups of two or three households in close proximity sometimes agreed on the date and place in order to complement each other. This was particularly the case during discussions on the IPP plot about limiting factors and options for remedying them, and it enriched the discussion and consequently the IPPs. According to the lessons learned, the areas where this strategy was adopted had better IPPs compared with the others.

2.5 STEP 5 – Presenting, discussing and enriching the IPPs in the PI group (Session 4)

Once each IP has drawn up his/her IPP, the next step is to present the IPP in the final plenary session with the group of PIs. Here, each PI presents their IPP and the various practices they will be implementing to achieve this vision. The other PIs follow each PIs presentation and make suggestions for improvement.

Each PI presents for 3-5 mins, followed by a short 3-5 mins discussion. With 25-30 PIs, this session can take 4-5 hours.

The good practices observed by others and the group discussions enable new lessons to be learnt, which in turn will enable the PIs to improve their IPPs.

NB: The IPP is dynamic, it can be updated according to good practices, innovations or new lessons learned by the farmer during the implementation of his IPP. It's important to stress this at the end of the sessions!

→ The 4th session lasts approximately 4.30 hours

3. TECHNICAL TRAINING AND MUTUAL LEARNING WHEN IMPLEMENTING IPPs

Once the IPPs have been created, support is needed to help the PIs implement their plans. This involves capacity building on technical aspects, mutual learning through exchange visits and field days, and other activities beyond the household level (and potentially facilitated by the project, such as linkages to agro-input dealers, seed suppliers, financial institutes, etc.).

- **Technical training for implementing best practices on the IPP**

Most of the training provided is based on requests expressed by the PIs. It should be noted that the trainings are always participative, taking into account the existing knowledge of the farmers and emphasising practical demonstration in the field.

These training sessions are generally organised at a time when the PIs are going to start implementing the lessons learned, hence after IPP creation and - depending on the kind of practice – in the dry or wet season, or when a practice is best implemented on the IPP. This allows the PIs to apply the lessons learned during the training directly on their IPP or other plots.

For example, in Burundi and DRC, **contour lines are staked out** (using the A-frame) in the dry season, when the fields are not yet occupied by crops, which is also the best time for farmers to dig trenches and build stone bunds on the contour lines. The same applies to **the production of seedlings in nurseries**, which must begin in the dry season (June-July) so that the seedlings are ready to be planted in the early months of the rainy season. Training in crop management techniques (and good farming practices) is also provided at the right time of year for the crops in question.

Experiences in Burundi

After the IPPs were created, the PIs expressed their need for technical capacity building. In response to these needs, the project provided training in the following areas:

- Tree nursery establishment and production of seedlings
- Techniques for planting living hedges and agroforestry trees in crop fields
- Staking out contour lines, building trenches (fanya ju mostly)
- Gully control techniques
- Technical crop management (4 days per season, with good farming practices such as staggered rows, ridges, contour farming, intercropping, etc.)
- The production of organic matter in the form of compost
- The liming technique
- Mineral fertiliser application techniques

Since the training emphasises practical demonstration, they were organised in consultation with the farmers, and often on PI fields for demonstration purposes. Other themes were proposed by the project to help the PIs strengthen their commitment to and ownership of the actions, such as:

- Integrated soil fertility management training (1 day)
- Transformational leadership training (1 day)

- **Organisation of exchange and learning visits between PIs**

With the development of IPPs, it is expected that innovative farmers will develop various best practice options. We recommend that exchange visits for mutual learning are organised during each season by the project. These visits will enable mutual learning, and serve to continually enrich each other's IPPs.

- **Organising field days**

In addition to the technical trainings given to PIs, field days are organised. The field days are based on the positive experiences that we had with them in the PAGRIS project. Field days consist of practical training and demonstration sessions on the IPP plot in the presence of nearby PIs, as well as other neighbouring farmers. As far as possible, local technical extension services (from the district or sub county) will take part in these days to ensure greater ownership of the project's activities by local structures.

The themes to be developed during these field days will depend on the needs expressed by the PIs, and will be planned in collaboration with them according to the right period for each theme, such as:

- Technical / practical trainings for crops,
- Best practices and innovations that farmers would like to learn about (e.g. composting techniques, green manures, integration of sustainable soil management practices, etc.).

During these days, the project staff will take into account what farmers already know and will give them the opportunity to share their knowledge and experiences in order to motivate each other, as the positive experience of peers with regard to a good practice can positively influence its adoption by others.

This activity is of vital importance because it enables the PIs to improve their practical skills, but also, by involving farmers in the neighbourhood, it enables knowledge to be disseminated to neighbours in the village and paves the way for the IPP process to be extended to other generations.

An example of how this activity was conducted according to the experience of the PAGRIS project is given in Appendix 2, where it was carried out more intensively, taking into account the phenological stages of the crop. This is only an example, and as explained above, the themes may vary according to the needs of the PIs.

- **Other types of support**

As part of the SWOT analysis for PIP implementation, farmers may mention topics that cannot be solved at the household level, or through trainings; but require different types of actions. For instance, farmers may indicate a lack of good quality inputs. This requires establishing linkages with trusted agro-input dealers and/or seed producers. Project staff may facilitate these linkages by actively seeking these partners and linking them to the relevant group of farmers.

Another example could be that farmers need access to credit to implement certain practices. This requires linkages to any form of credit; either through local savings groups (which could be encouraged to increase their savings, get additional financial literacy trainings, etc.); or to more formal organisations such as SACCOs, banks or micro-finance institutes.

Other topics, such as theft, deforestation, land use on steep slopes or land ownership could need policy interventions, e.g. through by-laws or through higher government layers. Project staff could help the PIs to establish linkages with relevant policy makers and advocate for their support and intervention.

Finally, sometimes improved access to output markets provides incentives to farmers to enhance their farming practices and maintain their land for increased productivity. This could be done by exploring linkages to existing output buyers in the vicinity, or reaching out to new potential market players.

It is important for field staff to keep an eye out for these different types of potential interventions and opportunities, and build on them to further strengthen farmers' capacities to improve the sustainability of their production and land use.

APPENDICES

Appendix 1: Example of an action plan for an IPP

Season A /Year 1	Season B /Year 1	Season A /Year 2	Season B /Year 2
<p>Crops Alternate crops of maize, potatoes and cassava</p> <p>Practices</p> <ul style="list-style-type: none"> ○ Maintenance of contour lines ○ Planting agroforestry trees and shrubs and hedges ○ Liming ○ Applying organic and mineral fertilisers ○ Staggered sowing ○ Weeding ○ Continuous ridges for cassava ○ Alternating crops ○ Ploughing the soil and planting along contour lines 	<p>Crops Banana and beans intercropped with cassava</p> <p>Practices</p> <ul style="list-style-type: none"> ○ Maintenance of contour lines ○ Liming ○ Applying organic and mineral fertilisers ○ Staggered sowing ○ Weeding ○ Continuous ridges of cassava ○ Staggered of banana ditches ○ Ploughing the soil and planting along contour lines 	<p>Crops Banana/ maize intercropped with potatoes and cassava</p> <p>Practices</p> <ul style="list-style-type: none"> ○ Maintenance of contour lines ○ Liming ○ Applying organic and mineral fertilisers ○ Staggered sowing ○ Weeding ○ Continuous ridges of sweet potatoes ○ Maintenance of banana ditches ○ Ploughing the soil and planting along contour lines 	<p>Crops Combined soybean crops Banana, sweet potato and cassava</p> <p>Practices</p> <ul style="list-style-type: none"> ○ Maintenance of contour lines ○ Liming ○ Applying organic and mineral fertilisers ○ Staggered sowing ○ Weeding ○ Continuous ridges of sweet potatoes ○ Combined and alternate cropping ○ Ploughing the soil and planting along contour lines



Appendix 2: Description of field days according to the PAGRIS project methodology.

At PAGRIS, field days are practical training-demonstration sessions on the IPP plot, taking into account the plant's 4 phenological phases (*sowing, weeding, growth, harvesting*). They take place in the presence of the PI, but also of other nearby farmers (the other PIs in our case), as well as technical extension services and government representatives.

The following boxes describe how this activity was developed in the PAGRIS project, with messages appropriate to each of the plant's 4 phenological phases.

Sowing phase

Introducing the principles of ISFM and explaining the purpose of the meeting, the other important points to be discussed are:

- The previous crops grown ;
- Preparing the site ;
- The crop to be sown (variety, quality of seed including origin) ;
- Recommended crop spacing ;
- Application of organic fertiliser ;
- The possible need for liming ;
- The application of base fertilisers ;
- Explain the types of fertiliser used and why they were chosen;
- Explain the role of each type of fertiliser and the role of each of the major elements contained in each type of fertiliser;
- Explain the method of application;
- Explain the conditions for success ;
- Fertiliser dose per ha, per 10 ares plot for the crop concerned ;
- Dose per spray-bundle (if applying to spray-bundles) ;
- The main pests and diseases affecting the crop and how to control them.

Weeding phase

- Reminder of the previous session;
- The importance of weeding:
- Factors favouring weeds ;
- Effects of weeds on crops.
- The importance of ridging for certain crops ;
- How to apply fertilisers ;
- Why fertilisers are applied, why certain types of fertiliser are split, why a given fertiliser is chosen, the dose, the method of application and the conditions for success;
- Show and explain the difference in vegetation between the Demos IPP and the fields next to it;
- Demonstrate the staking technique for climbing beans and tomatoes and explain its importance

Growth phase

- Reminder of the previous session;
- Activities related to crop maintenance and according to observed needs (plant disease management, etc.)
- Show and explain the difference in vegetation between the Demos IPP and the fields next to it;

Harvesting phase

- Reminder of treatments and IPP management ;
- Reminder of observations made during the season (rainfall and its distribution; the importance of run-off; diseases and pests that could not be controlled, etc.; anything that helps to understand the yield obtained and the possible difference with the expected yield).
- Disseminate messages on the importance of measuring the IPP harvest;
- Show and explain the difference in yield between the IPP and the control of another farmer or of the PI who has not experienced good practices (if there are any in the vicinity) ;
- What if there is no difference? Look for the reasons by analysing climatic conditions, diseases and pests, etc.
- Remind farmers of the importance of returning crop residues (except in the case of potatoes) and other forms of organic matter such as manure, compost, agroforestry, etc.
- Specify the crop rotation planned and why;
- Communicate important information for the day of the joint results presentation.

Appendix 3: Example of a current and future image of a IPP

