

Coffee Implementation Guide

for Vietnamese smallholders



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Introduction

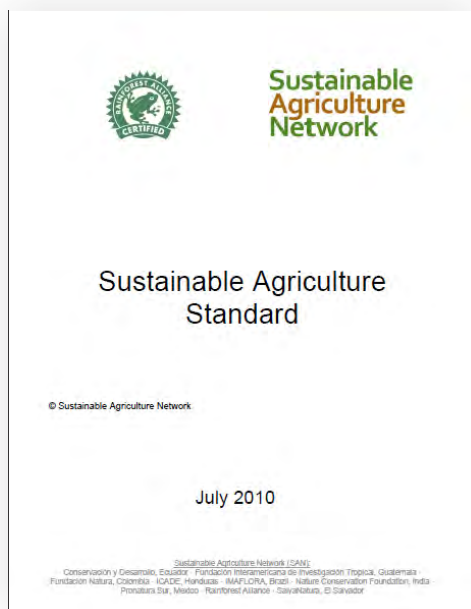
towards sustainable agriculture



Coffee is one of the most important agricultural crops in Vietnam, and is a source of income for countless smallholder farms. While all of us wish that coffee production continues in the future, some practices on the farms are sustainable, and some practices are not sustainable.



If certain practices continue to contaminate the environment, exhaust the water or soil, or exploit the workers, coffee production cannot last in a long run. It is important to ensure that each producer takes the responsibility to produce coffee in a sustainable way.



How can smallholders produce coffee in a sustainable way? This “*Coffee Implementation Guide*” shows simple and practical implementation techniques of sustainable agriculture in smallholder coffee farms in Vietnam.

The content of this guide is based on the “***Sustainable Agriculture Standard***” published in July 2010 by the Sustainable Agriculture Network. This standard covers all the important areas of sustainability. This is the basic document when a producer opts for Rainforest Alliance certification.

Conditions for certification



In order to achieve Rainforest Alliance Certification, following are the minimum conditions.

1. Comply with **80%** of all the criteria. *(There are 99 criteria in total.)*
2. Comply with **50%** of each principle. *(There are 10 principles.)*
3. Comply with **all** the critical criteria. *(There are 15 critical criteria.)*

In the case of smallholders, many criteria are non applicable. In this guide, we focus on the criteria that are applicable and important for smallholder farms. Please keep in mind that this guide does not cover all the criteria or all the principles of the standard, nor does it cover the cases of big plantations.

Content of this guide

This guide consists of the following 8 chapters, each of which corresponds to a principle of the standard.

Chapter 1: Integrated Pest Management

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Corresponds to: Principle 8

Chapter 2: Safe handling of chemicals

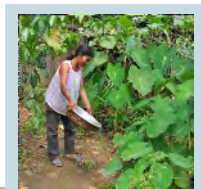
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Corresponds to: Principle 6

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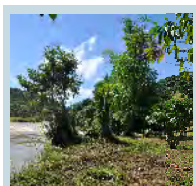
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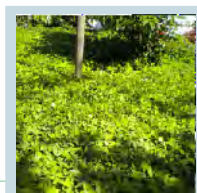
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Corresponds to: Principle 1

Integrated Pest Management

In order to keep the coffee trees healthy and productive, it is suggested to prevent pests and diseases, and control them appropriately. This section will describe how to manage pests and diseases in a sustainable way.

Coffee Leaf Rust (*Hemileia Vastatrix*)

Symptom: The first symptoms of Coffee Leaf Rust are yellowish circular spots on the underside of the leaves, after about a week these are covered by an orange powdery substance. Slowly these spots form larger circles. The upside of the leaf shows brown/yellow spots. If you do not take action, coffee leaves start dropping massively. Consequently coffee trees will die if severe infected. In the Central Highland, Coffee Leaf Rust spreads quickly in July and August and peaks in October and November.



Prevention and Treatment: The best way to prevent Leaf Rust from occurring is to have strong and healthy trees by applying correct techniques: selection of variety resistant to pest and disease, weeding, balancing fertilization and pruning. If infested, it is proposed to cut infected leaves, branches and burn to avoid spreading. If coffee trees are heavily damaged, uproot the entire tree including all its roots and destroy it by burning. Do not leave the uprooted trees around, as the fungus can spread and contaminate the farm.

Nematode

Symptom: It affects the coffee plant by causing lesion in the roots, limiting the plant to uptake nutrition and water. Common symptoms include yellow leaf, leaf loss, rotted roots and poor growth.

Prevention: The best way to avoid the development of nematode is to apply Good Agricultural Practices:



1. Weeding (cutting grass is recommended).
2. Balancing fertilization, increased use of organical and bio-fertilisers.
3. Pruning.
4. Flooding irrigation is not recommended to avoid spreading.
5. If seriously infested, it is proposed to uproot the entire tree including all its roots and destroy by burning. The infested parts should be well removed from the farm; it is suggested that planting seasonal crops such as bean family for at least two years to improve the soil fertility before replanting coffee trees.



Mealy bug



Symptom : Mealy bugs are small insects covered with a white mealy wax which form colonies. They live on the young-part shoots, roots and small cherries to suck sap from young shoots, young cherries, and roots which make coffee leaves discolored and cherry loss. Mealy bugs secrete a honey-type substance that attracts ants which can lead to fungus development and therefore these two insects are commonly found in the same area.

Prevention: It is suggested to maintain a clean plantation by cutting weeds and pruning; proper irrigation and shading trees, balancing fertilisation. If a light infestation, it is recommended that you irrigate with high pressured water to wash it; cutting the affected area (young cherry or shoots) and burned to avoid spreading.

Stemborer (*Xyleborus morstatti*)

Symptom: The stemborer will harm buddy branches and make them dried and dead. Clear symptoms include the leaves are wilting, and later branches are easily broken as the stemborer develops deep black tunnels inside the branches. In the Central Highland of Vietnam, this insect damages at the start of the dry season in September and October and damages peak during December and January.



Prevention: The best way to prevent Stemborer from occurring is to have strong and healthy trees by applying correct techniques of selection of pest and disease resistant variety, weeding, balancing fertilization and pruning. It is recommended to regularly visit the farm to timely to identify the disease and cut off the infested branches (5 to 10 cm from the infested hole).

Agrochemical use

It is important that the farm carefully evaluate the use of agrochemical and apply them only as a last resort.

- ✂ Do not use chemical or biological substances that are illegal or prohibited by World Health Organization.
- ✂ Reduce the use of active ingredients from World Health Organization Class I and II.
- ✂ Keep records of applications and ensure to update the inventory of substances.
- ✂ Take all occupational health and safety measures as described in Chapter 2.

Pruning

Pruning is essential for keeping your coffee trees healthy and productive. It has the following benefits.

1. Pruning cuts life cycle of pests because it helps the coffee trees receiving more light for better photosynthesis.
2. Pruning maintains the correct balance between leaf area and crop.
3. Pruning prevents overbearing and dieback.
4. Pruned branches provide mulch for the soil. Mulch keeps the soil moisture level and prevents soil erosion. When mulch is decomposed, it also serves as organic fertilizer for the soil.



Pruning methods:

It is suggested to cut off infested, dry, weak, opposite grown branches, shoots and unproductive branches.



Establishing shade trees

Shade trees protect coffee plants by:

1. Reducing moisture evaporation;
2. Promoting a better balance between flowering and vegetative growth resulting in better berry production;
3. Improving soil fertility (Leguminous trees used for shade contribute substantially to soil health by providing organic matter, and fix nitrogen from the air to restore soil fertility);
4. Reducing the damage by the wind;
5. Preventing and controlling soil erosion.



List of indigenous trees used as shading trees are described in Chapter 4. In addition, there are some other commonly used trees for shading such as *Crotalaria juncea*, *Tephrosia candida* ...

Variety selection



It is recommended to plant the varieties that are productive and resistant to pests and diseases. The Western Highlands Agro-Forestry Scientific and Technical Institutes (WASI) has recently selected a number of varieties that are resistant to leaf rust with improved yield. In Lam Dong province, the three common varieties used are TR4, TR9 and TR11.



Planting of carefully selected clones

Safe handling of chemicals

Certified farmers should not conduct practices that damage their own health or other people's health. If you use chemicals for your vegetables and cattle, they need to be applied and handled in a safe way, for yourself, for your family and for your neighbors.

Personal protective equipment (PPE)

It is not acceptable to spray without Personal Protective Equipment (PPE) because:

When the solution leaks, it will wet your clothes and chemicals will touch your body.

Note:

This is a critical criteria. Not complying with this criteria will seriously affect the certification of the group.



You would inhale chemicals from your mouth and nose.

Solution will wet your hands and chemicals will enter through your skin.

If you do not wear boots, the chemicals will also touch your feet.



Waterproof overall

Chemical filter mask (Not a dust mask. A dust mask does not have a filter for chemicals.)



Dust mask



Goggles for eye protection

Raincoat or back protector

Nylon gloves

Urethane boots

Apron made of a plastic bag (recommended as an extra protection if the overall or raincoat does not fully cover the legs)

Note: Use a plastic bag used for non chemical items (grains etc.) Do not use a fertilizer bag.

Remember that all parts of the body needs to be covered.



Wearing PPE is important not only for vegetable spraying, but also for cattle spraying and fertilizer application.



For fertilizer application, you should wear at least gloves and boots.

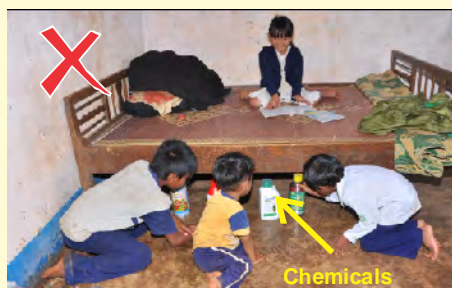
Safe storage of chemicals

What if you keep chemicals somewhere in the house? Toxic fumes that emanate from the stored chemicals may affect negatively the health of your family.



Examples of small chemical store made of a metal drum. It should be locked with a key. Do not put it directly under the sun.

If you keep chemicals in a bedroom, children may find them and drink one, thinking that it is a soft drink.



If you keep chemicals in an open place without a lock, children may find them while playing, or someone from outside may steal them.

The consequences of not storing chemicals properly is very serious, and could result in the death of a family member.

It is better to buy only the amount of chemicals you need and use them up right away, so that you do not need to store chemicals on the farm. In case you need to store any leftover chemical, follow the below points on how to store chemicals safely at a smallholder farm.

1. Size and structure

If you need to store only some bottles of chemicals, it is not necessary to build a storage “room” or “building”. A smaller structure would be sufficient for smallholders. For example, you can modify a metal drum, a metal trunk, an old furniture or an old chicken cage to be a storage. It is important that this structure is not placed inside the house.



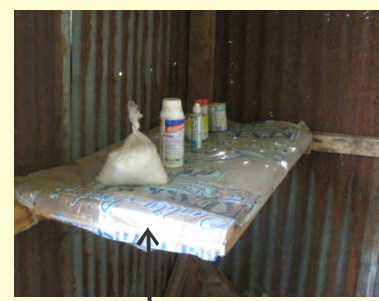
Storage made of metal drums

2. Waterproof materials

You can create a storage with locally available materials that are waterproof. Roof should be sound and not be leaking. If you are going to use wood, you need to line the surfaces with plastic so that spilled chemicals would not be absorbed by the wood.



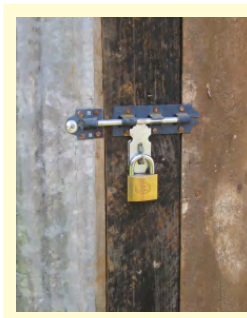
Inside the wooden structure covered with plastics



Wooden shelf covered with plastics

3. Locked

The storage needs to be locked, and the key needs to be kept securely. It is important to keep it locked so that children and other people would not open it and take the chemicals inside.



4. Warning sign

Put a warning sign on the storage so that it is clear to anyone that there are dangerous materials inside.



Establishment of live hedge

When you spray chemicals, you need to ensure that people passing by your farm would not be affected by the drift of chemicals from your farm. To prevent the drift of chemicals, it is recommended to establish life hedge around your farm. Live hedge also promotes biodiversity and connects ecosystems on the farm.



Distance between houses and production areas

If your family or workers are living on the farm, it is important to keep a certain distance from the houses and the field. If the coffee bushes or vegetable gardens are right next to the houses, people living in the house and children playing around the house would be affected by the drifted chemicals. You can prevent the drift by keeping a certain distance and also by establishing a live hedge.



Coffee field right next to the house



Distance between the field and the house

Waste management

Waste can be a useful resource again, if you recycle it or reuse it. Improper management of the waste would contaminate the air, water and soil of your farm. If you burn plastic waste or empty chemical bottles, toxic fumes would be emitted and would damage the health of your family.

Let us manage the waste properly to have a clean and healthy environment at your farm.



Burning of waste is prohibited.

Organic waste management



Kitchen waste and animal manure can be composted to make organic fertilizer. As you compost them, make sure to turn them every 2-3 weeks for aeration and to keep the temperature high enough for decomposition.

Plastic waste and chemical container management

Plastic waste and empty chemical containers should be collected separately. Wash the chemical containers three times and puncture them and dispose them in a way that would not contaminate the environment.



They should never be left in the field.



Barrel for collecting plastic waste

Bag for plastic waste

Ecosystem conservation



If you have any of the following types of area on your farm, that is an important ecosystem to be protected.

- ✦ Area with indigenous trees
- ✦ Area with endangered animals or plants
- ✦ Stream or river
- ✦ Spring
- ✦ Swamp or wetland
- ✦ National park or conservation area designated by the government



These areas need to be protected because they usually support a rich biodiversity of important species, and losing these areas would cause serious environmental damage, such as loss of endangered or indigenous species, soil erosion and water contamination. Therefore, they should not be converted to a coffee farm.

Note:

Not destroying these ecosystems is a critical criteria.



No cutting, no hunting, no farming

In order to protect these areas, it should be prohibited to extract firewood from the area, to hunt wild animals, to cultivate crops or to spray chemicals. This needs to be communicated clearly to all the workers and to the family members.



Planting of indigenous trees

In order to protect the biodiversity of the conservation area, you can plant indigenous trees at the border of the farm, around the water sources and on the steep slopes. It is important to plant indigenous trees, not foreign species, because indigenous trees are best adapted to the local climate and soil conditions, and can host rich biodiversity.



You can have a nursery of indigenous trees to produce seedlings by yourself.



Planting of indigenous trees



Steep slope planted with indigenous trees

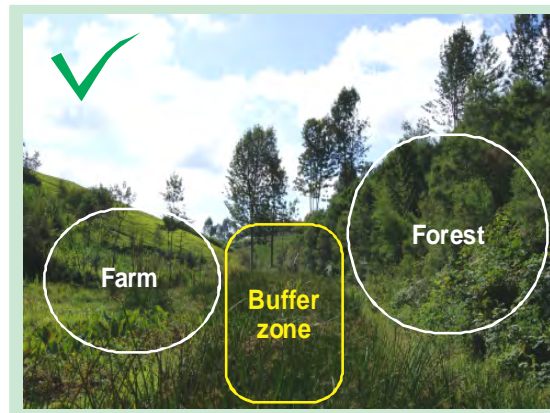
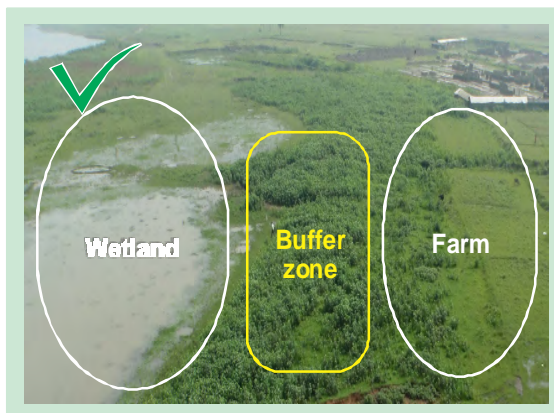
Examples of indigenous trees (used as shading trees) in Vietnam

- ✓ Cassia siamea
- ✓ Leucaena glauca
- ✓ Cajanus cajan
- ✓ Leucaena leucocephala
- ✓ Bamboo



Creating buffer zones

It is recommended to create a buffer zone between the conservation area and a farm to ensure that the drift of chemicals and agricultural activities would not affect the conservation area.

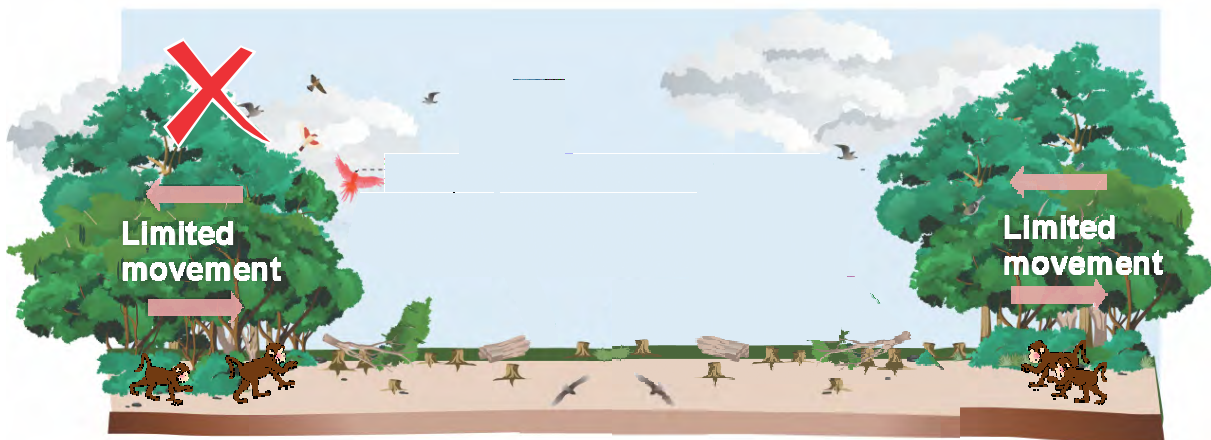


Connecting ecosystems

For animals and birds to move from one place to the other, they need forests to be connected. If a forest is disconnected by farms, animals cannot freely move around. If a water source is not connected to a forest, animals cannot access it.



Connected forests where animals and birds can migrate



Forests destroyed and disconnected by farms where animals and birds cannot migrate



Connected forest patches

To connect the ecosystems, you can plant trees at the borders of the farm to connect patches of forest, or conserve the existing forest corridors.



Water conservation



Water is fundamental for our lives and for agriculture. In this chapter, we learn about how to keep the water clean and how to protect water sources.

Washing of equipment



Equipment should not be washed in a river, stream or pond.

When you spray vegetable fields, wash the equipment and pour the washing water back to the field.

After spraying chemicals, you need to wash your application equipment and personal protective clothing (PPE). Water used to wash these equipment contains chemicals, so if you do not manage it properly, it would contaminate the environment.



When you spray animals, wash the equipment and pour the washing water into a soak pit. A soak pit should be filled with charcoal, which helps to purify the water. Do not cut down indigenous trees to make charcoal.



Soak pit filled with charcoal



Remember also to wash the protective clothing. Treat the washing water in the same way as described above.

Domestic waste water management



Washing clothes in a river contaminates the water. Throwing away dirty water from the kitchen outside the house also contaminates the environment and creates a breeding ground for mosquitos. Domestic waste water needs to be managed properly.



Domestic waste water, when its quantity is small, can be disposed by pouring into a canal dug in the backyard garden. The canal should be planted with bananas and taro, both of which absorb water very well.



Pouring domestic waste water into a canal dug in the backyard garden

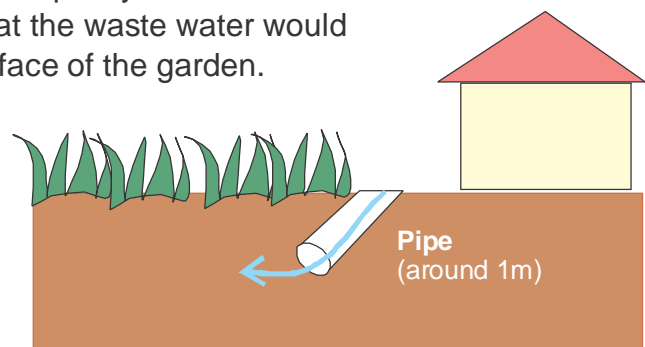


Canal
Banana plants



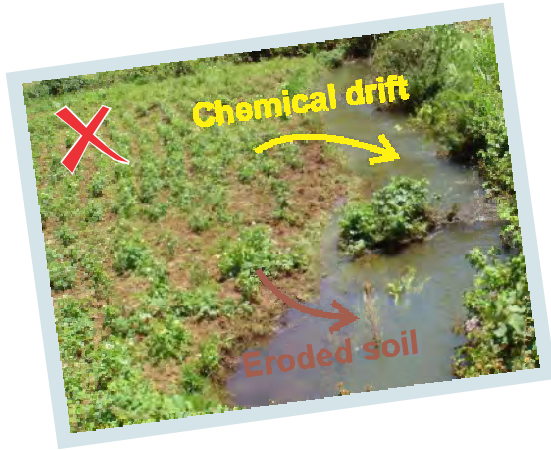
Taro

If you observe stagnant water on the surface of the garden, the quantity of waste water is too much for the soil to absorb, or the characteristics of the soil does not have much capacity to absorb water. In this case, you can bury a pipe so that the waste water would go underground instead of staying on the surface of the garden.



Not cultivating near water sources

It is not recommended to plant coffee or vegetables near water sources. When you spray them with herbicide or pesticide, chemical drift would enter into the water and contaminate the water. Cultivating near water sources would also cause soil erosion into the water. Let us keep the areas around water sources covered with natural vegetation.



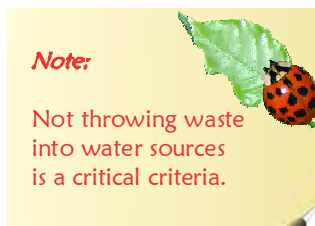
Rain water harvesting

Water is essential for our lives, and we need to secure sufficient supply of water for our living. Harvesting rain water is an economic and efficient way to obtain water. You can collect the rain water that falls on the roof, and keep it in a tank. You can use it in houses, and you can also use it for drinking after treating it or boiling it. Rain is an important source of water, and we should know how to use it well.



Not throwing waste into water sources

Throwing waste into water is not allowed. We need to protect the sources of water and keep the water clean for the lives of the animals and people in the community.



Soil conservation

Soil is the basis for agriculture. We need to ensure that the soil of the farm is not lost through soil erosion.

Soil erosion control

Where there is a steep slope, the soil tends to get eroded over time. If you do not control the erosion, it gets worse and worse.



In order to control soil erosion, you can plant Napier grass and indigenous trees in the areas susceptible to soil erosion. Napier grass holds the soil well, and it serves as feed for animals.



No burning

Burning destroys organic matter and microorganisms in the soil, and makes your soil poorer. Burning for preparing the land is prohibited.

Note:

No burning of the land is a critical criterion.



Good living and working conditions

If you employ workers on your farm, they need to be treated fairly. Your workers deserve a decent and healthy working and living condition.

Workers' housing

1. Rooms

Rooms where workers and their family live and sleep, should not have chemicals, fertilizers or their containers/bags. There should not be any water leaking from the ceiling and walls.



Chemicals and fertilizers in bedroom



Fertilizer bags on the wall



Damaged ceiling with water leaking

2. Kitchen

When a kitchen does not have escape for the smoke, the smoke contained in the room would cause serious health effects, damaging the lungs and eyes of the workers and their families.

A kitchen with a chimney protects their health and improves the workers' quality of lives significantly.



Worker suffering from the smoke filling up the room

Smoke



Improved kitchen whereby all the smoke goes out through the chimney
This improved kitchen is also fuel-efficient and consumes less firewood.

3. Toilet

Workers' housing should have clean toilets.



4. Laundry facility

Workers' housing should have a place to wash clothes. They should not need to go to a river to wash clothes.



Washing clothes in a river



Sink for laundry

Provision of potable water

Workers living or working on your farm should have access to clean water to drink. You should always have boiled or treated water available for them.



Children on the farm

Do not hire a child under 15 years old as a farm worker.



- Under 15 years old
- Contracted as a farm worker
- Cannot go to school because of the work

Note:

Not hiring a child under 15 years old is a critical criterion.



Children under 15 years old can help on their family farm, as long as they go to school during the day and they do not perform any dangerous activities.



Helping the farm work only outside the school hours



Farm management

Record keeping

It is recommended to document the important activities on your farm. By keeping records of your activities, you can reflect on your past activities, analyze them and find ways to improve them. By looking at the records, the internal inspectors and external auditors can also tell that you have been managing your farm well.

Following are the basic activities to be recorded at the farm level.

- Agrochemical application
- Fertilizer application
- Hired workers
- Training of workers
- Tree planting
- Harvesting



What to record for chemical and fertilizer applications

- Plot
- Date
- Name of product
- Quantity
- Dosage
- Operator name
- Equipment used

What to record for training of workers

- Date
- Topic of training
- Trainer
- Names of the participants
- Signature/fingerprint of the participants

What to record about hired workers

- Date
- Name
- Type of work
- Working hours
- Salary

Traceability

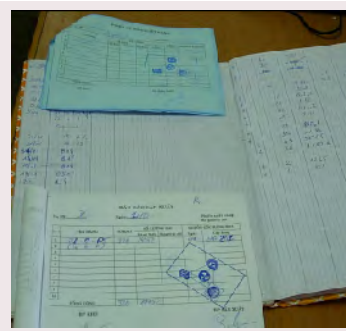
Farmers and their group should never mix non-certified coffee with certified coffee at any point. Certified coffee needs to be separated at all stages of transaction: at buying center, during transport, at the reception of the factory, during all the processing, up to the dispatch of final products.

Note:

Not mixing non-certified coffee with certified coffee is a critical criterion.



Separate transport for coffee from certified farms



Certified coffee are separately documented and identified



