

**Climate Smart
Agriculture (CSA)
Technology**
Farmer's Guide



Drip Irrigation System



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About the project

<https://cop.sac.org.bd/about-c-suces/>

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Cover Image Source

Title: Drip irrigation system for Potato crop
Source/credit: Anisha Mohan/IFPRI, Location: Nepal

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What?

Drip irrigation provides water directly to the root zone, thus reducing losses from run-off and evaporation. It enhances water use efficiency in row crops (vegetables, tea, coffee, and other soft fruits) and vine crops where water emitters can be provided for each plant.

Why?

It can maintain moisture within the root zone of the plant. It can also minimize nutrient leaching and thereby reduces fertilizer loss.

Saves Water, Time and Money

- Drip irrigation is the most efficient method of irrigation today.
- Prevents overwatering and results in less weeding.
- Conserves upto 30% water* and in some cases, even more than 50% water.
- Eliminates time spent in manual irrigation.
- Can be fully automated with a timer or soil moisture sensors.
- High fertilizer use efficiency (labour/ energy)
- Land grading & leveling not required
- Possibility of measuring water usage
- User friendly operation

* study link - Chapter 6- Drip Irrigation Training Manual
<https://www.fao.org/3/y1275e/y1275e00.pdf>



Title: Drip irrigation system for Cucumber

Source/credit: Mamata Pradhan/IFPRI

Location: Sri Lanka

Where can you apply?

Drip irrigation systems are Long lasting and adaptable and can be used just about anywhere -

- Farms
- Gardens
- Vineyards
- Protected houses(Greenhouses/Poly-houses/Rain-shelters)
- Hillsides or flat terrain



Title: Drip irrigation system
Source/credit: Department of
Agriculture - Sri Lanka
Location: Sri Lanka

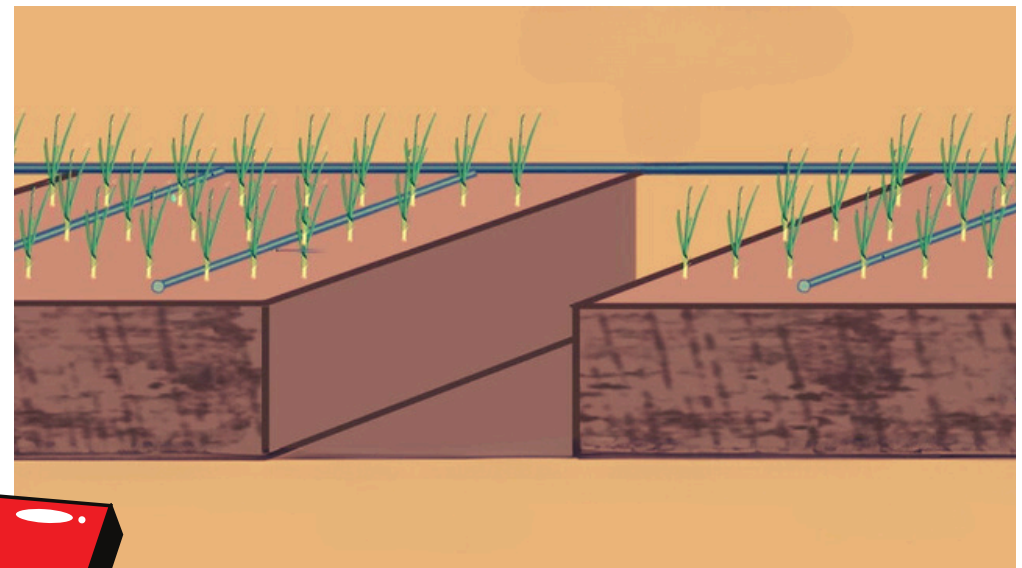
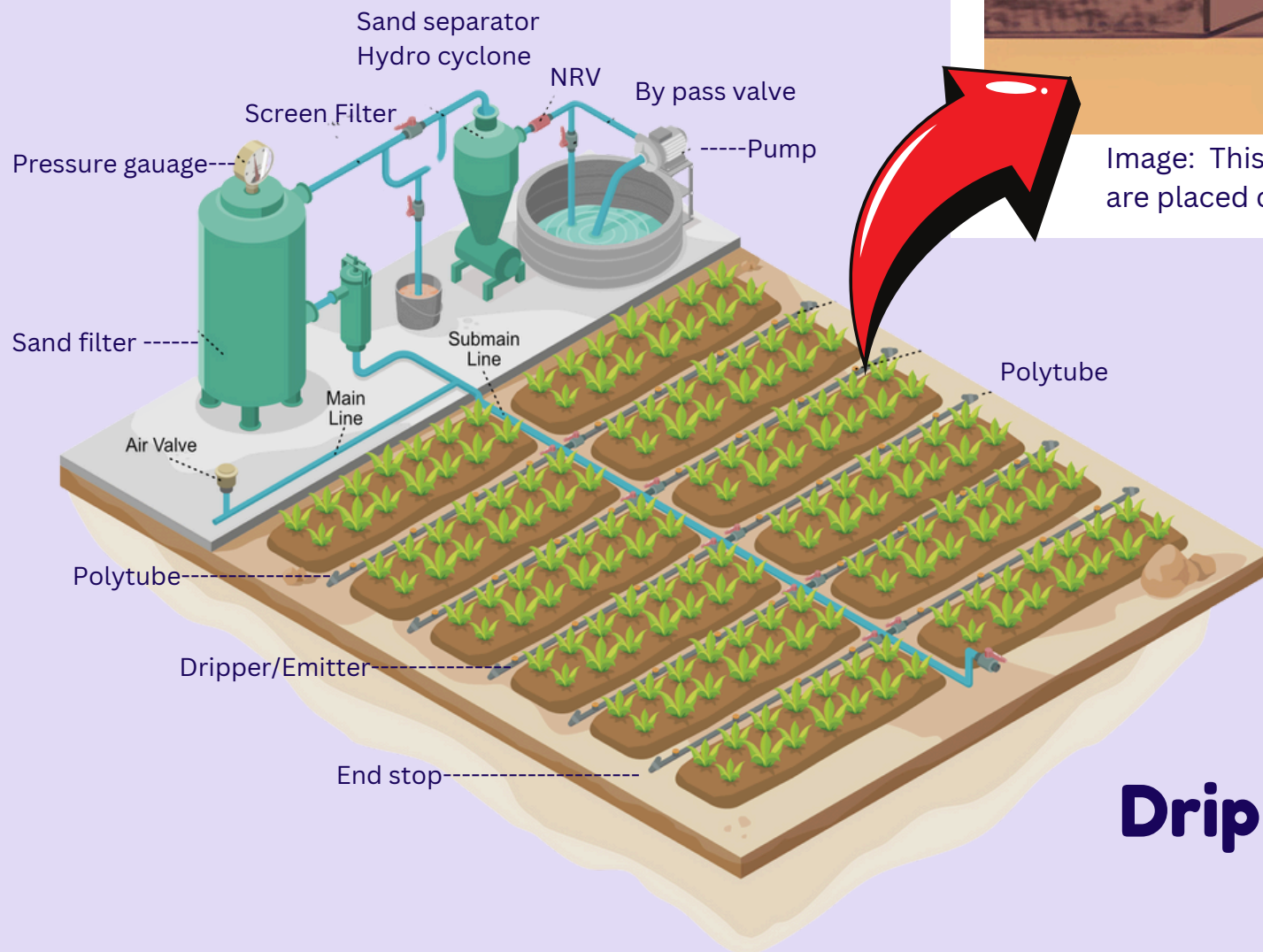


Image: This detailed view shows how the lateral pipes are placed on the planting beds (along the plant rows).

Drip Irrigation System

Main components

- **Pump unit** takes water from the source and provides the right pressure for delivery into the pipe system.
- **Control head** consists of valves to control the discharge and pressure in the entire system. This section have filters to clean the water. Common types of filter include screen filters or discs which remove fine material suspended in the water. Control head units contain a fertilizer tank or ventury systems which slowly add a measured dose of fertilizer into the water during irrigation. This is one of the major advantages of drip irrigation over other methods.
- **Mainlines, submains and laterals** supply water from the control head into the fields. They are usually made from PVC or polyethylene pipes and these PVC pipes should be buried below ground or painted with an enamel paint because they easily degrade when exposed to direct solar radiation.
- **Emitters or drippers** are devices used to control the discharge of water from the lateral to the plants. For row crops more closely spaced emitters may be used to wet a strip of soil. They are spaced at higher spacing when used for tree crops such as fruits and other perennial. Many different emitter designs have been produced in recent years. The basis of design is to produce an emitter which will provide a specified constant discharge which does not vary much with pressure changes, and does not block easily.

Suitable Crops

Drip irrigation is most suitable for row crops such as vegetables, tree and vine crops where one or more emitters can be provided for each plant. Generally, only high value crops are considered because of the high initial costs of installing a drip system.

Suitable Slopes

Drip irrigation can be successfully applied in farms with slopes or hills. It is because this system delivers water directly to the root zone of the plants which is useful on uneven land where water might drain too quickly.

Suitable Soils

Drip irrigation is suitable for most of the soils as it delivers water directly to the root zone of the plants. On clay soils, the emitter discharge rates must be slower to avoid surface water ponding and runoff. On sandy soils, water must be applied at a faster rate to ensure adequate lateral wetting of the soil. In general, drip irrigation is not recommended in sandy soils.

Suitable Water

- It is essential for irrigation water to be free of sediments. One of the main problems one can face with drip irrigation is blockage of the emitters. All emitters have very small dripping holes ranging from 0.2-2.0 mm diameter and these can become blocked if the water is not clean. Filtration of the irrigation water will be needed in that case.
- Blockage may also occur if the water contains algae, fertilizer deposits and dissolved chemicals which precipitate such as calcium and iron. Filtration may remove some debris but sometimes the problem may be too complex and require an experienced engineer or consultation with the equipment dealer.



Title: Drip irrigation system

Source/credit: Mamata Pradhan/IFPRI

Location: Sri Lanka



Title: Installing Drip irrigation system (Mr. C.K. Wickramatunga, deputy director of agriculture, Ministry of Agriculture, Sri Lanka demonstrating the installation of Drip irrigation System)

Source/credit: Himanshu Pathak/IFPRI

Location: Sri Lanka

Remember

- Many people assume that drip irrigation saves water by reducing the amount of water that is required by the crop. But this is not true. The amount of water used in drip irrigation does not change, only the method of applying water changes.
- The water saved using drip irrigation is from the reductions in deep percolation, in surface runoff and in evaporation from the soil. Therefore, the water use efficiency in drip irrigation is significantly higher.
- Drip irrigation is not a substitute for other proven methods of irrigation. It is just another form of irrigation. It is best suited to areas where water availability is less, quality is marginal, land is steeply sloping or uneven, where water or labor are expensive, and/or where high value crops require frequent irrigation.

Activity Time

Activity 01 : Picture your farm

- Try drawing your farm (Need not be perfect) using simple lines, Curves or shapes.
- Try giving a name to your farm as you recognise it based on its size, location or may be based on directions it is facing.
- Write or draw crop names as plan.
- Try pasting a picture/photo if you are not willing to draw at all.

Activity 03 : Evaluate CSA methods

- Try evaluating adopted CSA methods and keep a track over the year.
- Try keeping as per your real experience.
- Ask Facilitator to guide if you are not able to see significant impact on your farming practice.

All activities would be performed with the help of facilitators.

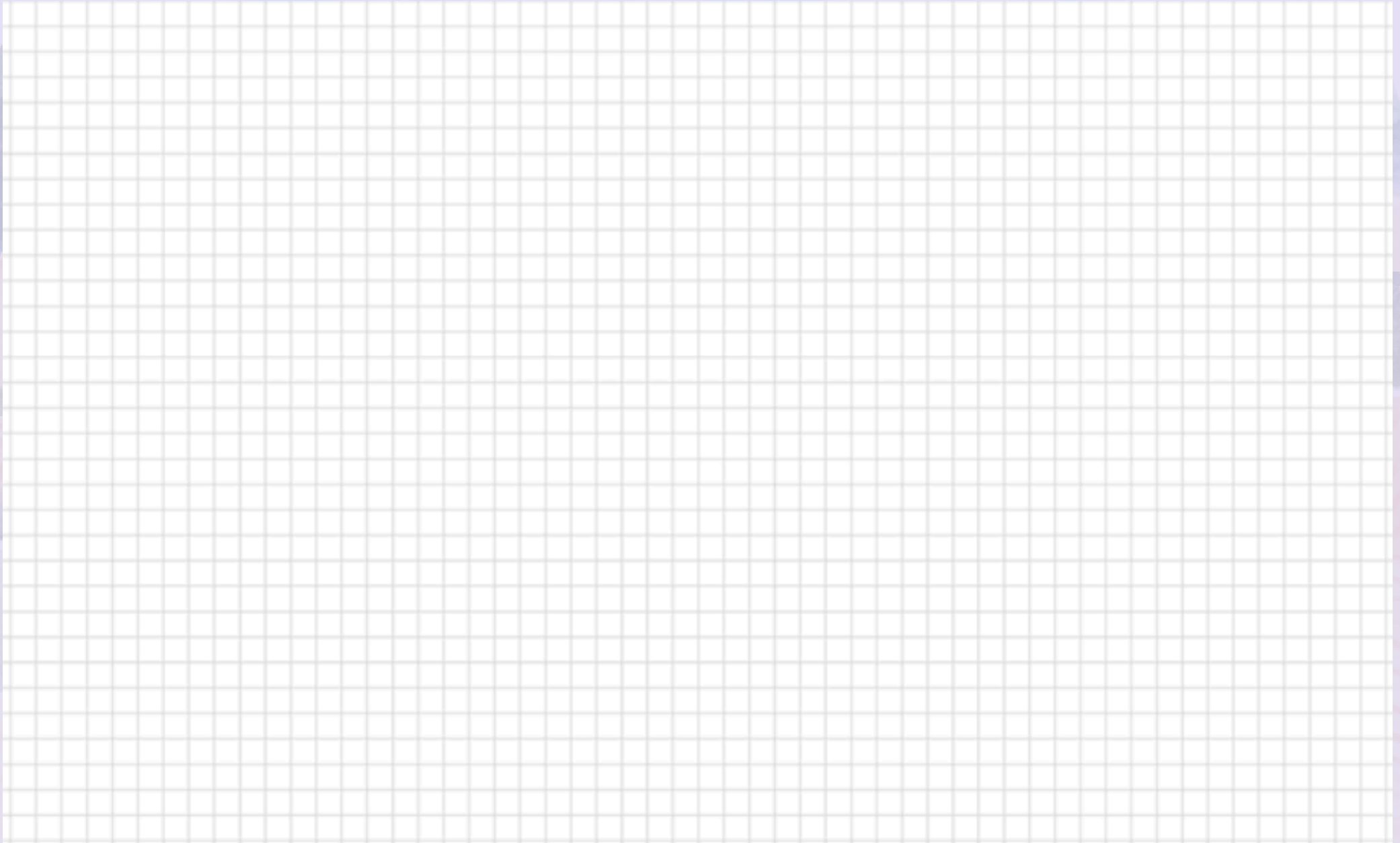
Activity 02 : Create your farm profile

- Try Filling information of your farm.
- Take help of your facilitator if you can not fill it on your own.
- Try discussing it with other farmers in farmer group.
- Try to learn more about farm profile.

Activity 04: Feedback form

- Give feedback as it will help your facilitator to help and improve your learning.
- Discuss it with other farmers and learn about their experience as well.
- Ask questions and take help of your facilitator, when you need.

Activity 01 : Picture your farm (Current conditions)



Activity 02: Create your farm profile

• Farm type	
• Terrain	
• Area	
• Aspect (Farm facing direction)	
• Physical features	
• Soil Type	
• Inputs needed <ul style="list-style-type: none">◦ Labor◦ Machinery◦ Water◦ electricity◦ fertilizer◦ pumps	
• Temperature Range (By month)	
• Precipitation Range (By month)	
• Commonly grown crops	
• Natural challenges (climate, pests, invasive species-weeds)	
• Any CSA methods in use	

Activity 03 : Evaluate CSA methods

(Post-implementation)



Decreased



No impact



Partially Increased



Significantly Increased

Resources and indicators

• EASE OF TECHNOLOGY USAGE

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• CROP PRODUCTION



• CROP QUALITY



• OCCURRENCE OF PEST



• OCCURRENCE OF WEEDS



• WATER REQUIRED



• FERTILIZER REQUIRED



• LABOR REQUIRED



• INCOME



• WORKLOAD



• FREE TIME AVAILABLE



• USAGE OF CSA METHODS IN FUTURE



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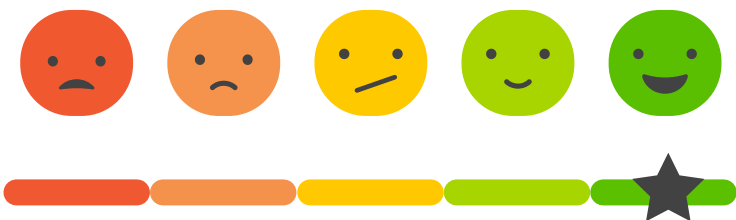
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Activity 04 : Feedback form



Experience scale

Do you have any question/Suggestion?

Fill the feedback form below at end of your training by marking it like this. 😊👍 that is closer to your experience.

1. What do you like the most about this guide?

2. Is there anything that you want to suggest for improvement?

3. Do you have any suggestions for facilitator?

4. How useful are these sessions for you for your farm?



5. How engaging are these sessions?



6. How likely are you to recommend CSA methods to other farmers?



This image shows a single page from a notebook or ledger. At the top, there is a light blue horizontal band containing the word "Notes" in a bold, black, sans-serif font. Below this header, the rest of the page is white and filled with thin, grey horizontal lines spaced evenly apart, providing a guide for writing. The corners of the page are rounded.

This image shows a blank sheet of white paper designed as a notebook page. At the top, there is a light blue rectangular header area with rounded corners. Inside this header, the word "Notes" is written in a bold, black, sans-serif font, centered horizontally. Below the header, the rest of the page is filled with horizontal ruling lines. These lines are evenly spaced and extend across the width of the page, providing space for writing notes.



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