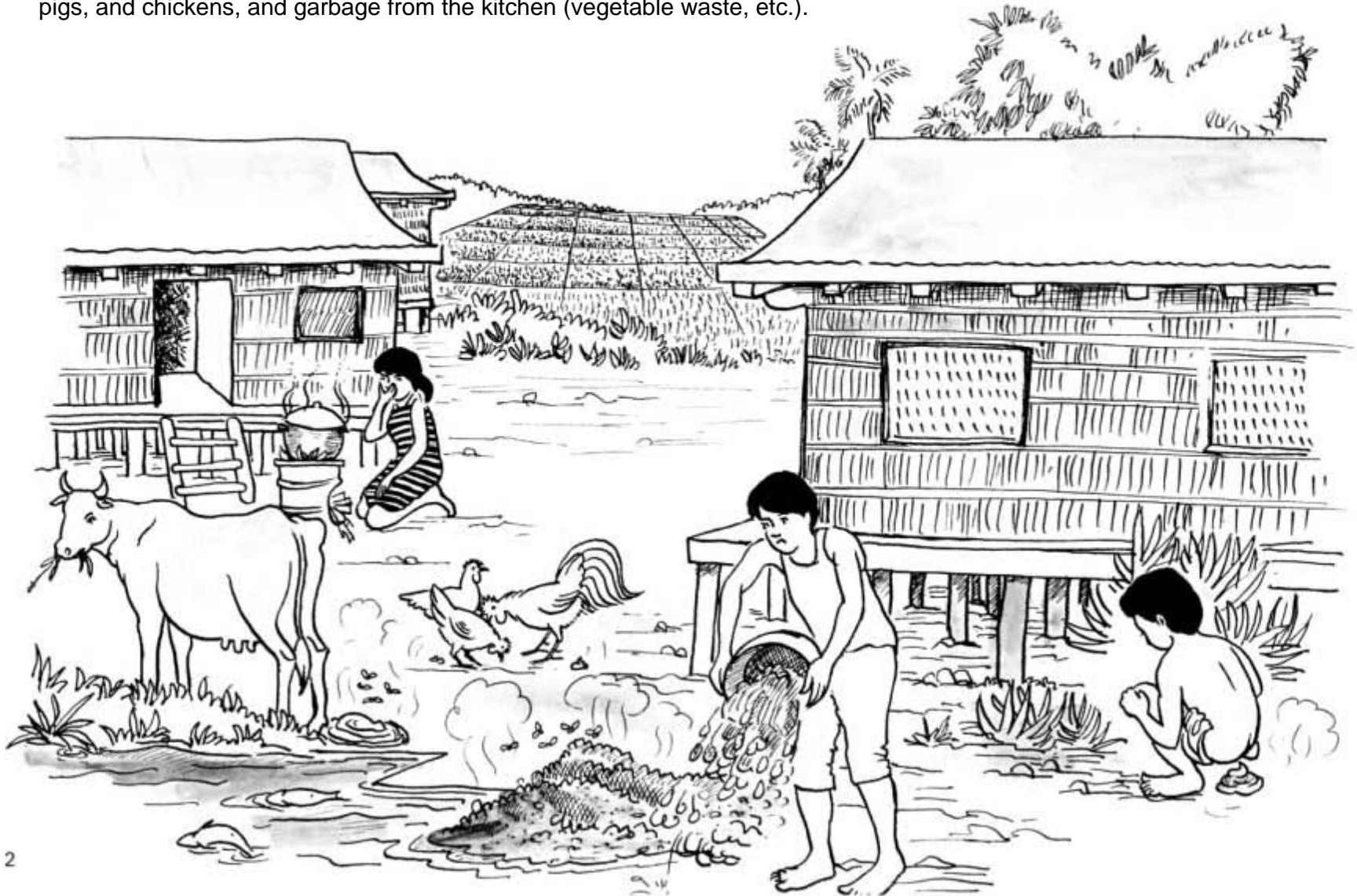


# USE OF GAS FROM DAILY WASTES

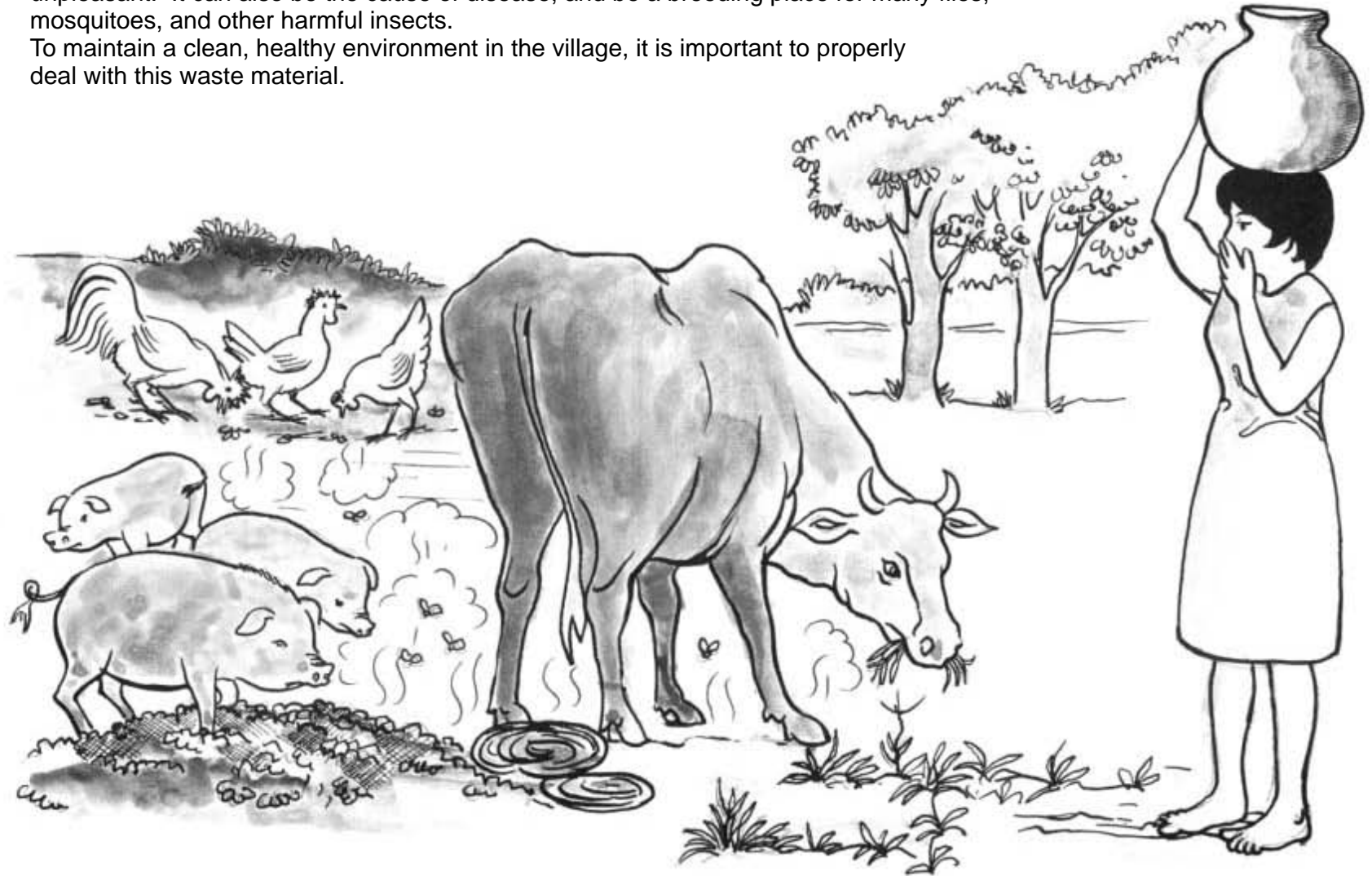


## Much waste material in everyday living

Much waste material of many kinds is produced by us in our day-to-day living. These waste products include excrement of humans and animals such as cows, horses, goats, pigs, and chickens, and garbage from the kitchen (vegetable waste, etc.).

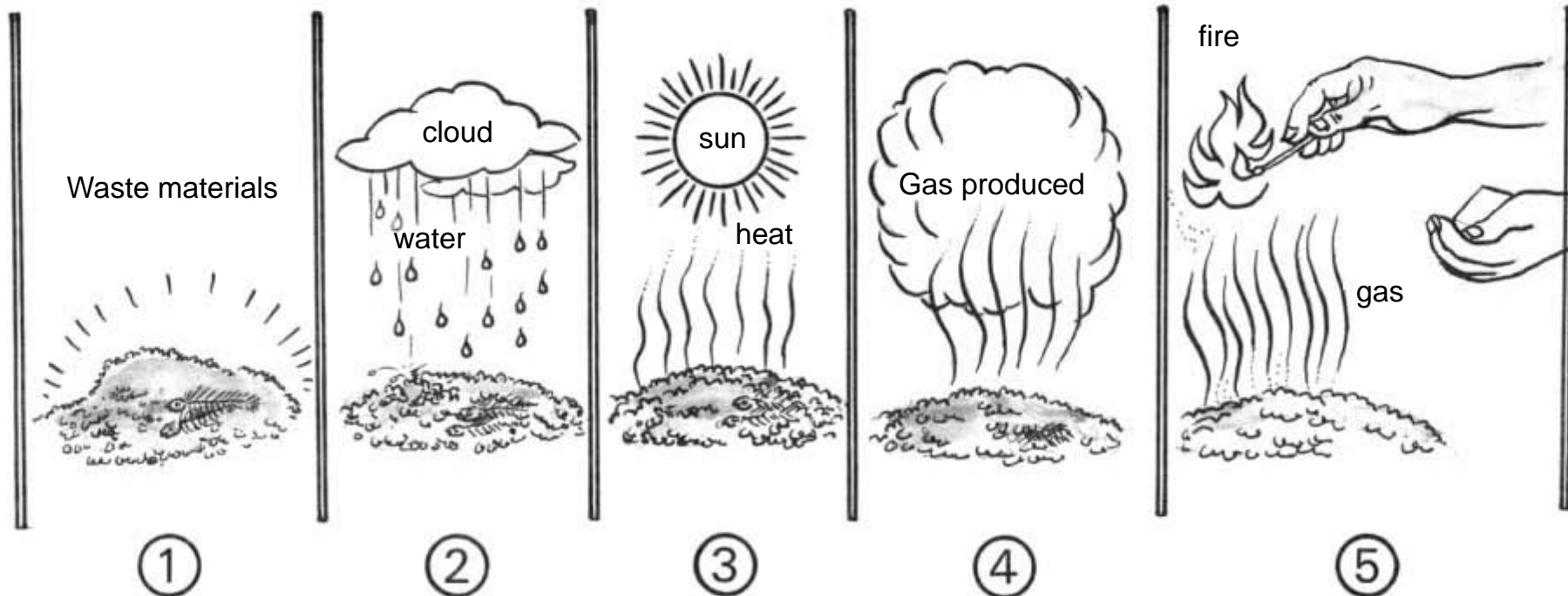


Garbage and other waste rots, giving off bad smell, and making our living environment unpleasant. It can also be the cause of disease, and be a breeding place for many flies, mosquitoes, and other harmful insects. To maintain a clean, healthy environment in the village, it is important to properly deal with this waste material.



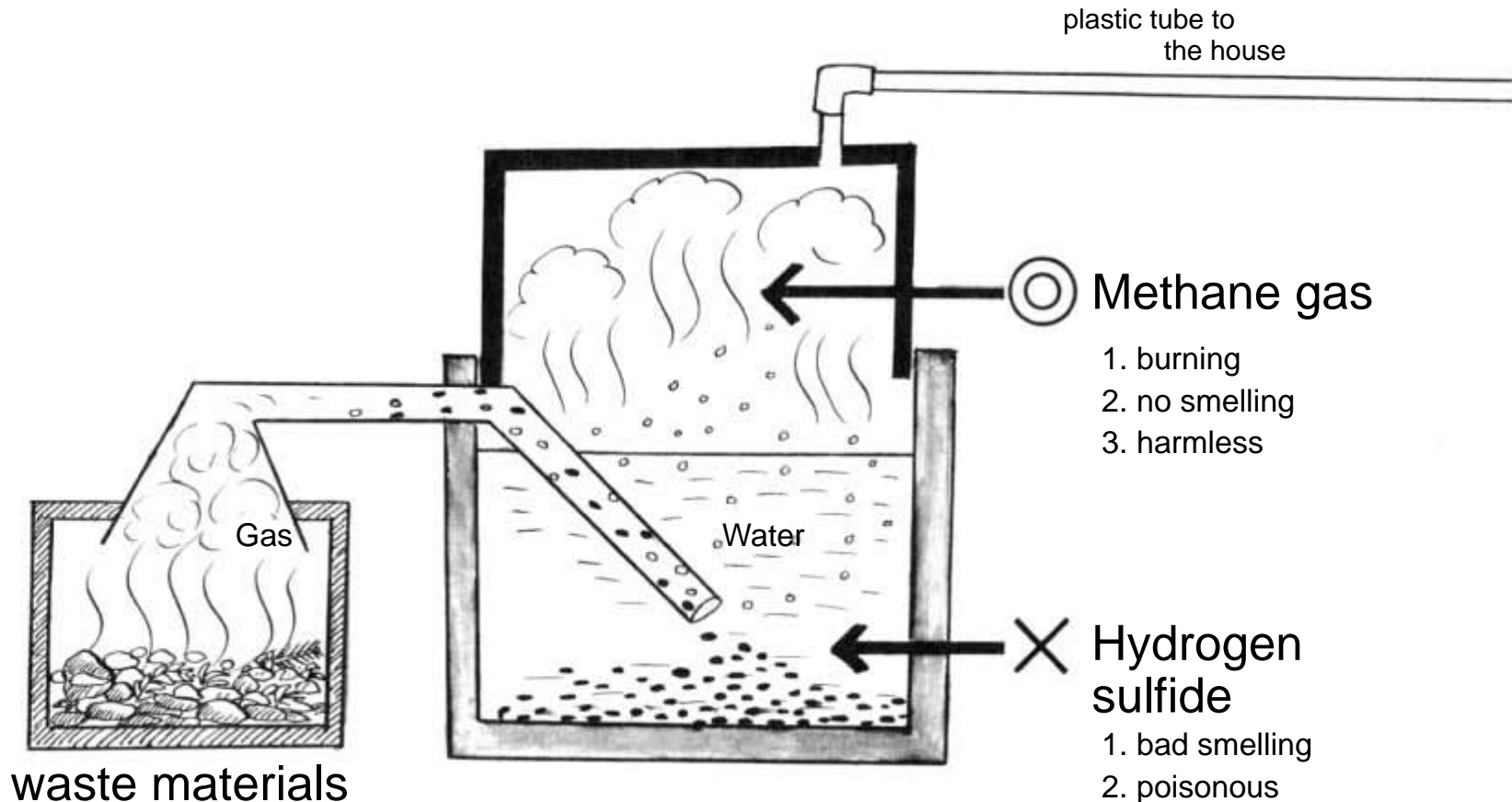
## Why methane gas is produced?

When moisture and heat are added to these waste products into a container that keeps out air, they begin to rot, and a kind of gas is produced. This gas, called methane gas, produces a hot flame when burned. Let's think about how we can use this heat energy source as fuel and at the same time help keep our environment clean.



## What is methane gas and how can it be collected?

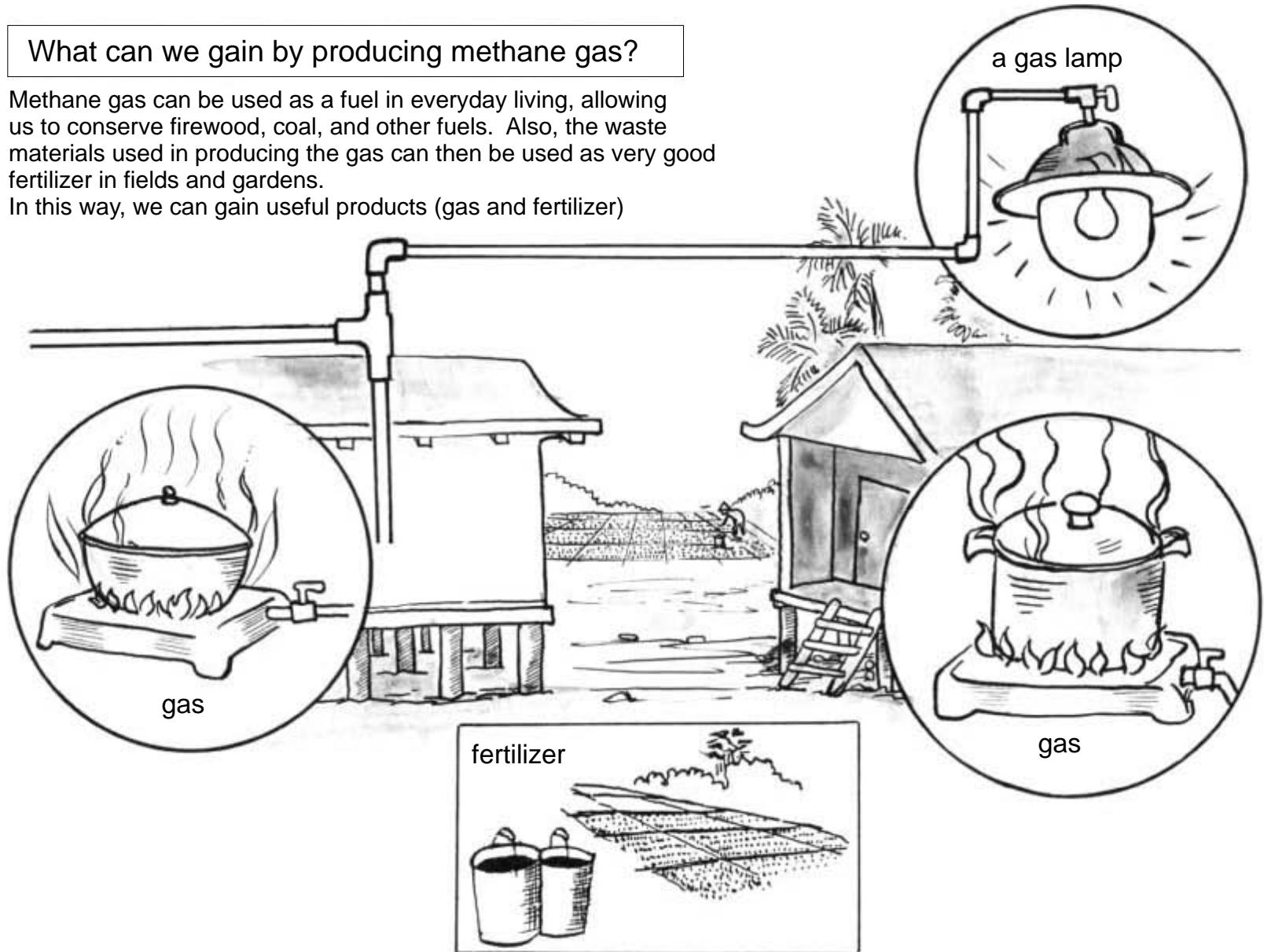
Methane gas burns easily and produces a hot flame, and can be used to boil water or cook. Methane gas itself is no smelling and tasteless and is lighter than air, but other gases are also produced along with the methane gas. One of these, hydrogen sulfide, is a poisonous gas that smells like rotten eggs. This dissolves in water, so most of it can be filtered out by passing methane gas and hydrogen sulfide mixture through water, making the methane gas safe to use.



## What can we gain by producing methane gas?

Methane gas can be used as a fuel in everyday living, allowing us to conserve firewood, coal, and other fuels. Also, the waste materials used in producing the gas can then be used as very good fertilizer in fields and gardens.

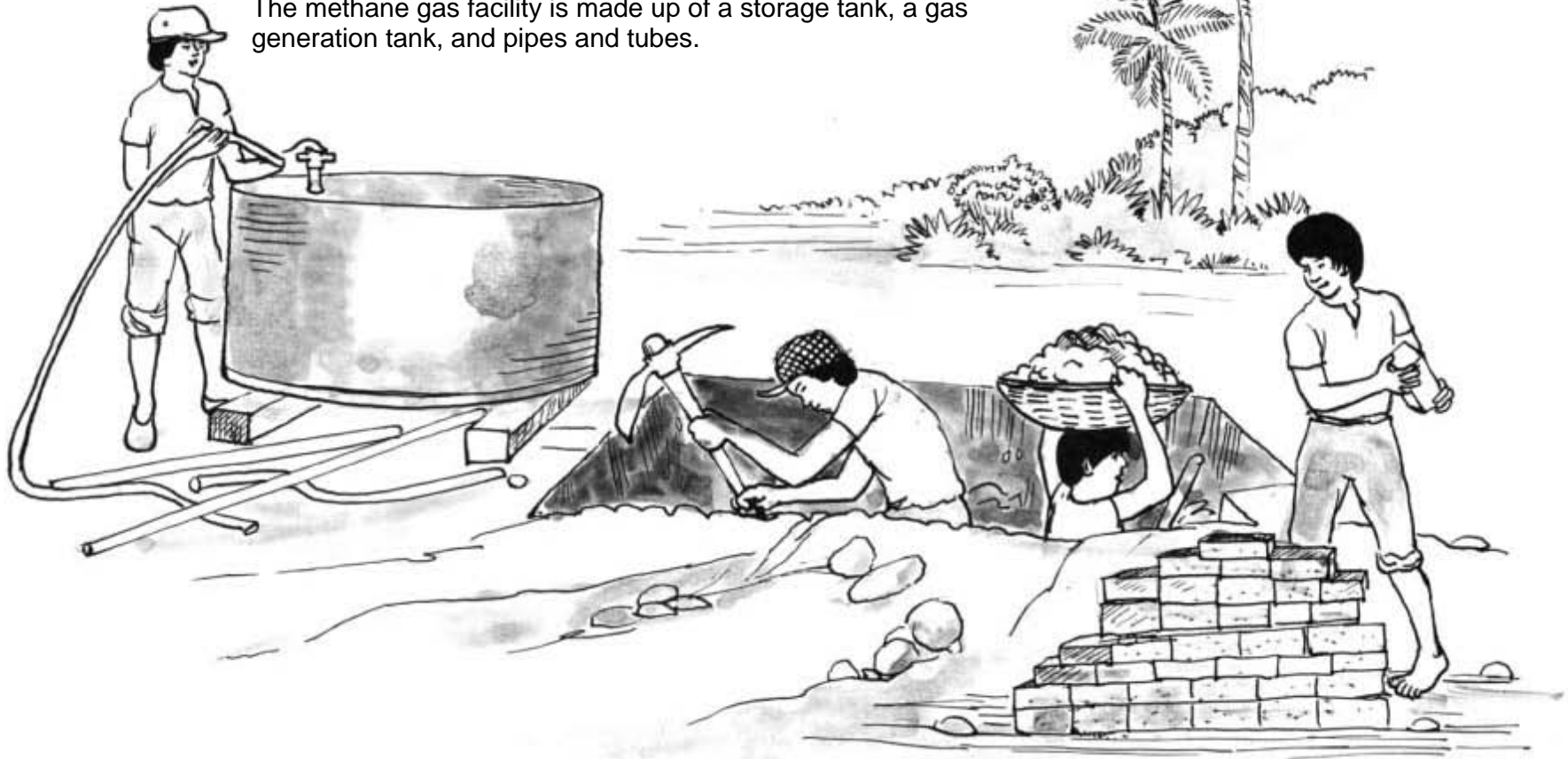
In this way, we can gain useful products (gas and fertilizer)



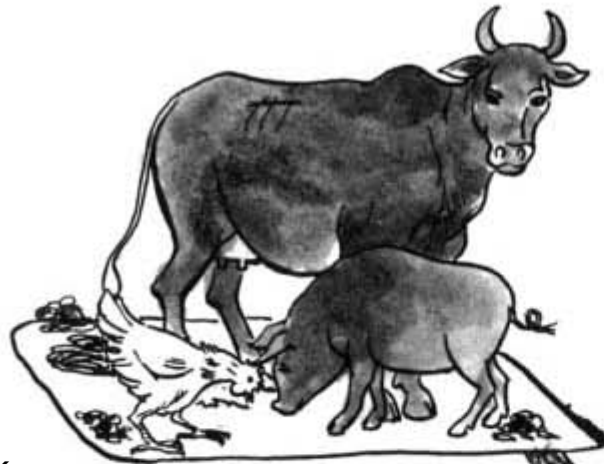
## Let's try to make a methane gas facility

Small methane gas facilities can be made for individual homes, and a larger facility can be built as a cooperative project for use by a number of homes. Once it is built, the methane gas facility can be used for many years with almost no maintenance cost.

The methane gas facility is made up of a storage tank, a gas generation tank, and pipes and tubes.



# Methane Gas Production Facility



- livestock

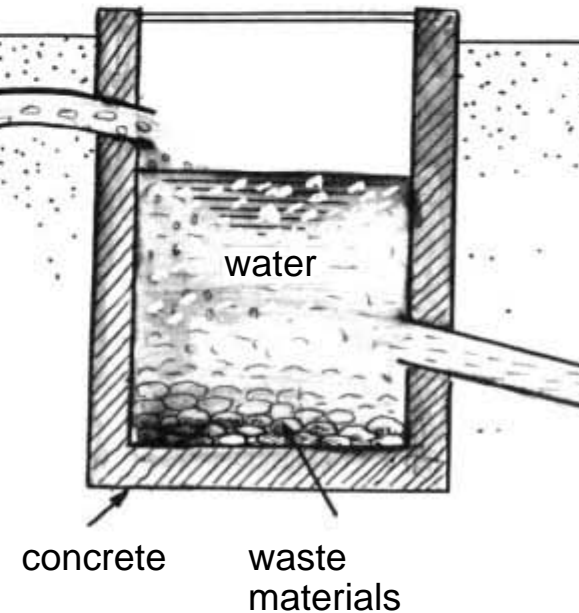


- human excrement
- rotten vegetables and other matter



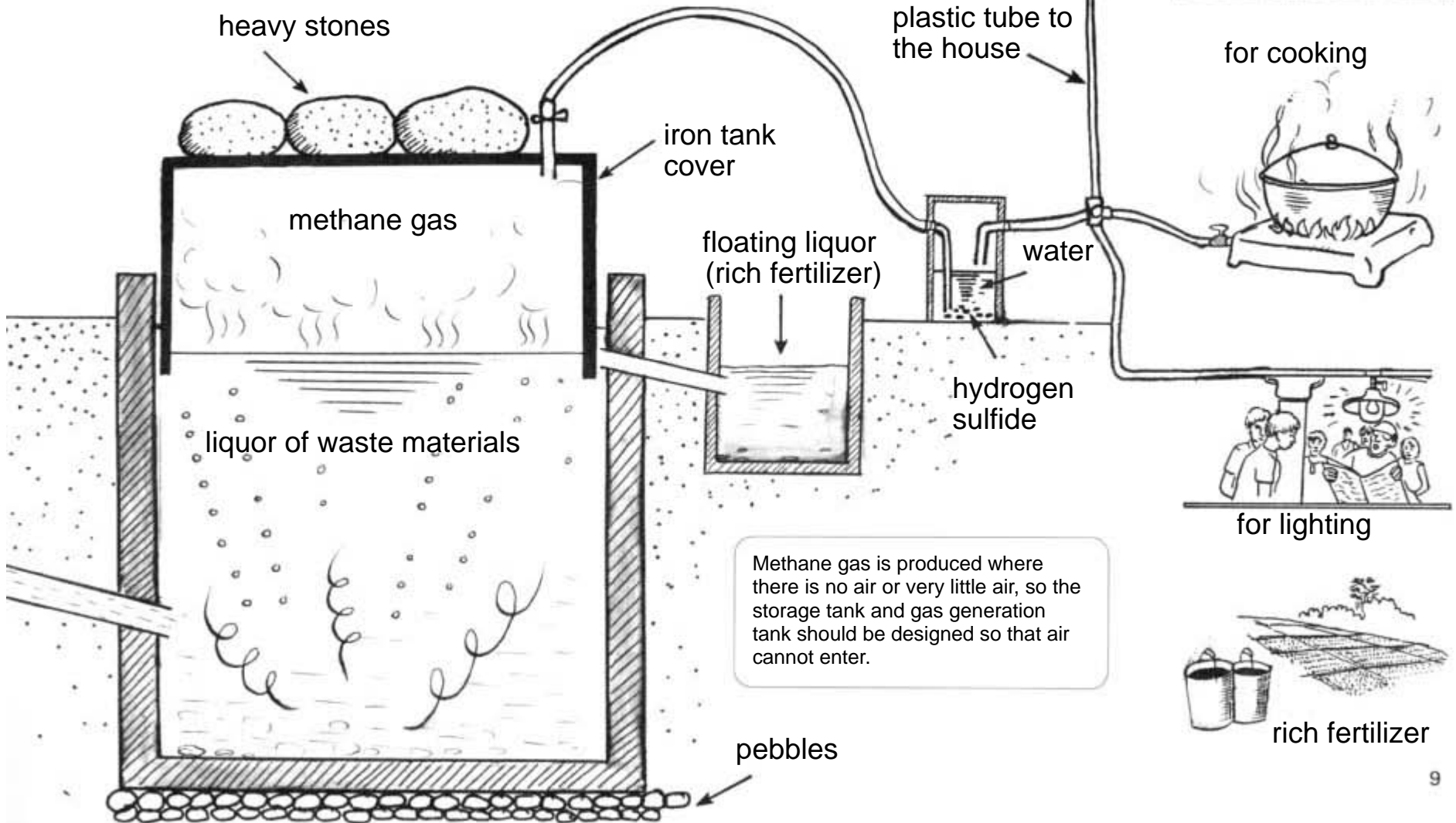
Waste materials to be used are kitchen wastes, human and animal excrement, and weeds and grasses, but Wood, metal, plastic, cloth, etc. should not be used.

## Storage tank



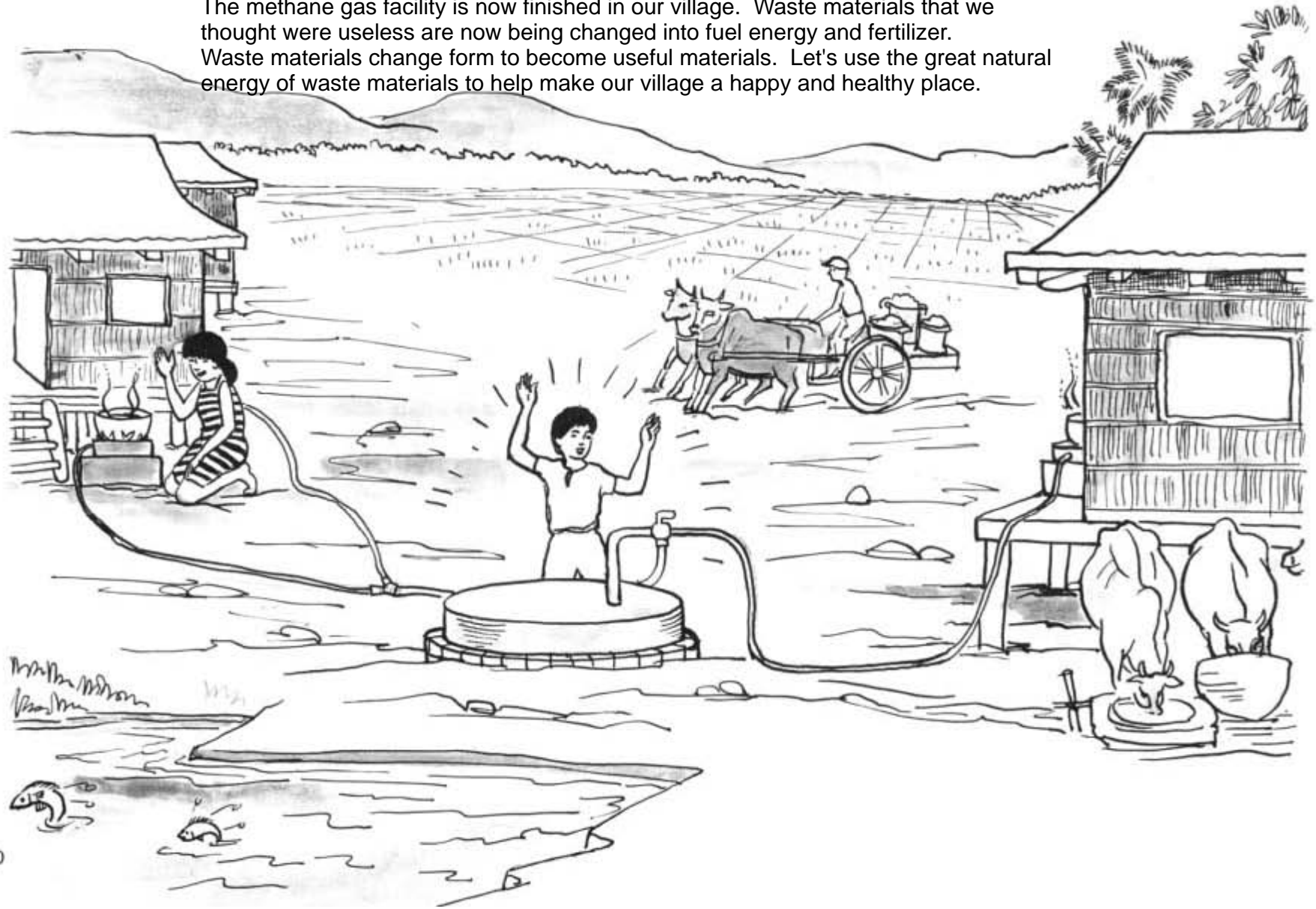


# Gas generation tank



## Let's have nature do more for us

The methane gas facility is now finished in our village. Waste materials that we thought were useless are now being changed into fuel energy and fertilizer. Waste materials change form to become useful materials. Let's use the great natural energy of waste materials to help make our village a happy and healthy place.



# Guide for Utilization

## Objectives:

1. To promote scientific point of view among learners to deal with daily matters.
2. To improve the circumstances of the daily life using the scientific knowledge.
3. To think the possibility of using methane gas produced from daily wastes.

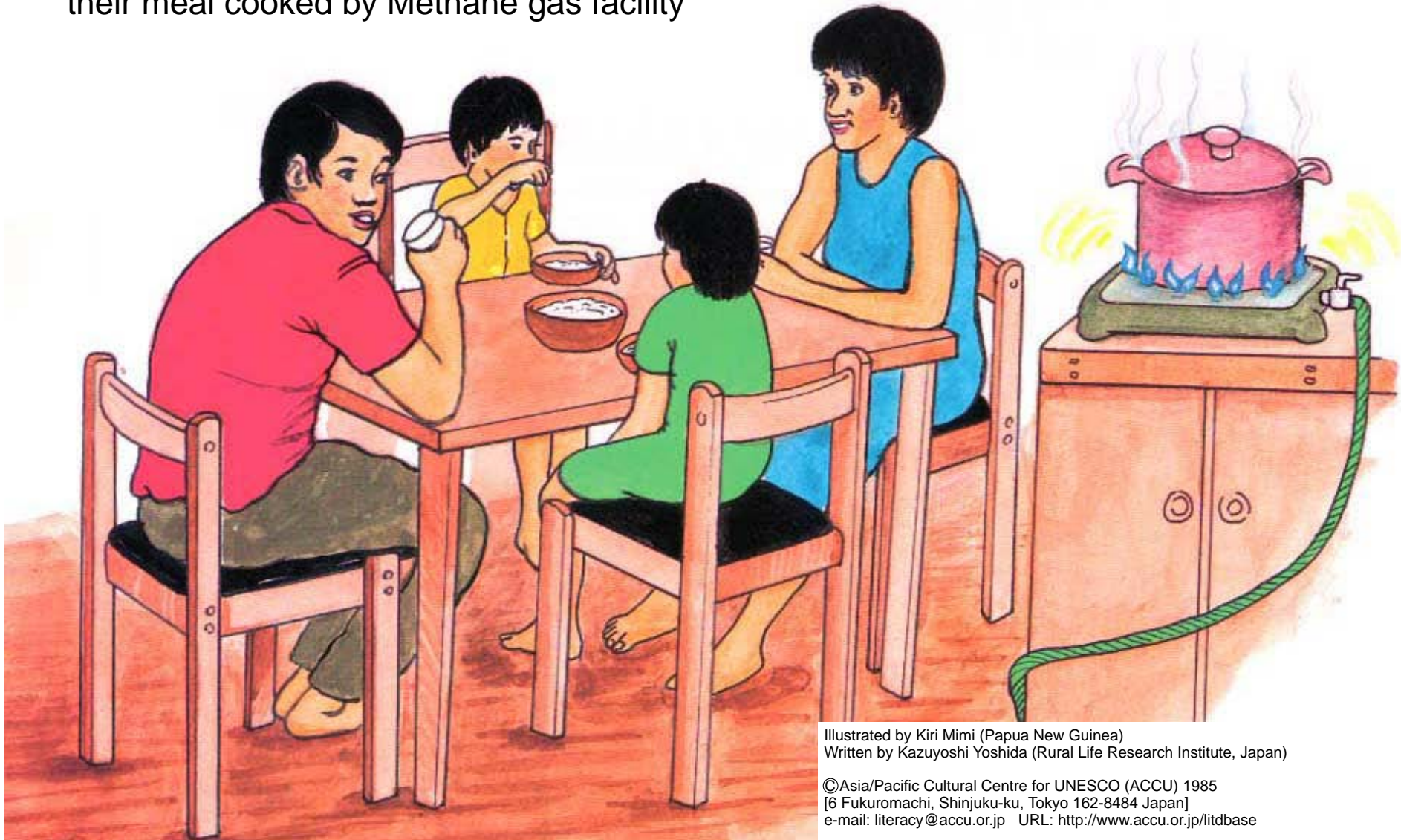
## Target:

Middle level neo-literates.

## Applications:

1. Before distributing the booklets to learners, instructor asks how they actually deal with their daily wastes in a village.
2. Instructor distributes booklets to learners and asks them to read. Points of interest and problems are then taken up in question-and-answer and discussion among participants (including instructor).
3. Instructor suggests to a group of interested people how to get the information on technique, materials needed and possibility of financial assistance to build methane gas facilities.

Family members are enjoying  
their meal cooked by Methane gas facility



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