



Practical implications

Vertical gardens are suitable for households that wish to produce vegetables in a controlled environment, close to their house. Being off the ground, the crops are protected from small ruminants and fowls. Our research has shown that particularly the **second wall** and the **planting tower** have the potential to increase production of leafy green vegetables, other types of vegetables, or even spices. While the planting tower provides a larger surface for planting in a free stand, the second wall has the advantage of needing less space and being more protected.

The systems are especially suitable for households with land constraints to produce vegetables. To address the needs of women, who are mainly involved in producing vegetables, the systems are designed to save time and labour. The vertical gardens can be established close to the house and kitchen, where the vegetables are used for cooking. Once the systems are constructed, the water distribution system (cotton cloth) and included biological materials, such as manure or compost, reduce time for watering, fertilisation and harvest.

Required materials and skills

The garden systems were conceptualised to re-use materials that are already present in the household (old clothing, plastic bottles). Constructing a **second wall** or **planting tower** requires the following materials:

Material	Examples of locally available materials
3 pipes á 80 cm, prepared with holes in a diameter of 1-2 cm at a distance of 5 cm	PVC pipe or any material that can be put into a pipe shape
15 long and flexible sticks, sharpened on one end	Cypress Branches or other bendy branches
8 sturdy sticks, approximately one meter	Eucalyptus branches – their length defines the height of the system
Nails	Any type of nails
Larger piece of fabric	Gunny bags or any other material that can hold soil, waterproof fabric (such as wax cloth) increases the durability
Rope to fixate sticks	Rope made of sisal or other plant materials
Cotton materials for water distribution in the system	Old T-Shirts, jeans, other clothing, but the materials should be cotton and not a synthetic material
Gravel	Any hard gravel that prevents waterlogging
Substrate	Home-made compost from manure (cow or goat), household waste, and plant residues. Mixed with a ratio of 80 parts soil and 20 parts fertiliser
15-20 plastic bottles	Bottles any size and shape, for example, water or soft drinks

The construction needs similar skills as building a granary or wall of a house. The best time for establishing and planting of the vertical garden is the beginning of the planting season. After two to three seasons, the cotton cloth on the surface of the garden systems needs to be replaced. To maintain the fertility of the soil, crop residues can be placed on the top so that the nutrients leach into the soil when watering.



