

Guidelines for the Sustainable Harvesting of Traditional Medicinal Plants in Zimbabwe

For Ministry of Environment and Tourism

by

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Acknowledgements

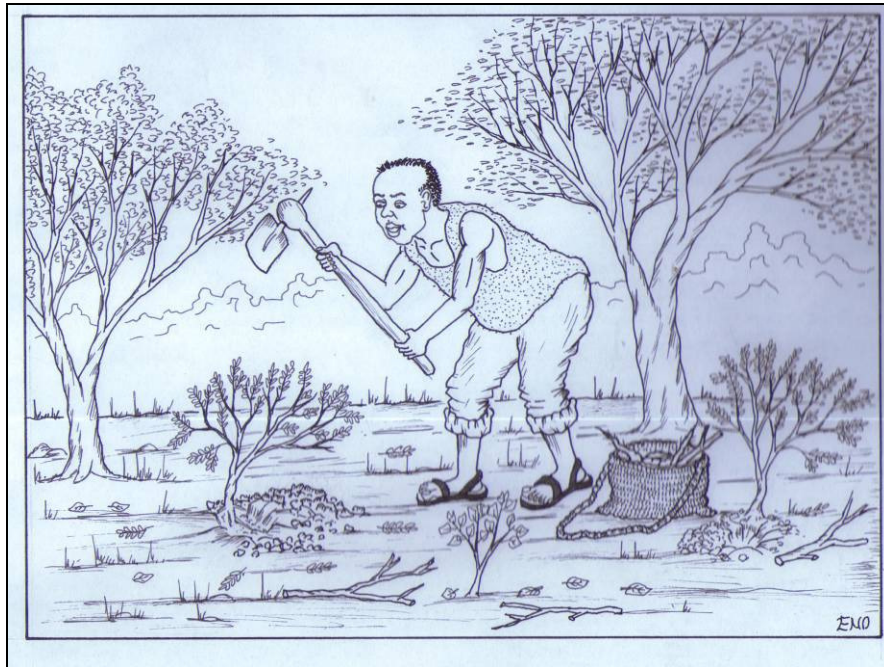
This manual is the result of a participatory process and is built on the input of many people. First and foremost, we would like to express our deep gratitude to the leaders and members of the SAFIRE Harvesting Groups who were actively involved in the assessment of harvesting techniques in use and a collection of best practices. At all stages of the work, they have given us a warm welcome, dedicate their time, shared their knowledge and valuably contributed to the content and design of this document.

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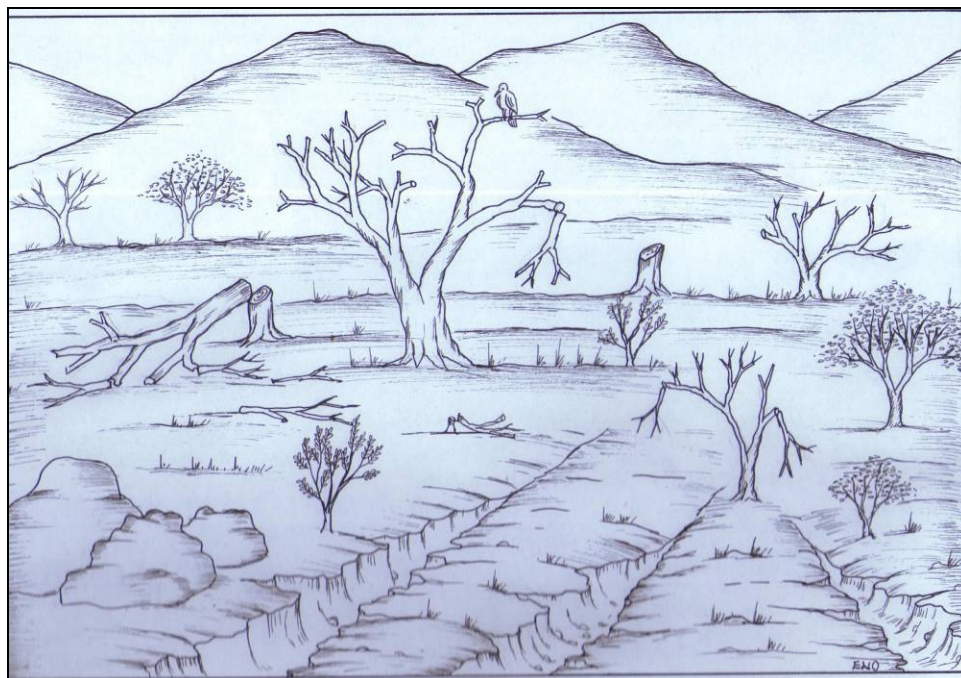
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1. Introduction and background

There is a long tradition of using medicinal plants in Zimbabwe. Various parts of plants, such as roots, bark and leaf material are collected, processed and used throughout the country. The use of medicinal plants in traditional healing is an important pillar of the health sector. The increasing numbers of practitioners selling herbal remedies and medicinal plants indicate the acceptance and popularity of the use of herbal medicine in Zimbabwe.



Due to lack or loss of traditional knowledge and the growing demand for these herbal remedies from both domestic and foreign markets, many of the medicinal plants in the open woodlands of Zimbabwe are being over-harvested and/or unsustainably harvested and becoming highly threatened. Furthermore, some of these plant species do not grow anywhere else in the world. The long-term availability of medicinal plants is of vital importance, not only for the practitioners, but also for the preservation of indigenous medicinal knowledge.



Degraded woodland

Thus, conservation and sustainable use of medicinal plants are of a high importance. Cultivation may be a solution to decrease the threat of extinction of some plant species, but cultivation is not easy and is impossible for some of the plants. Accordingly, gathering medicinal plants from the wild will always continue. Historically, conservation and sustainable use of medicinal plants used to be achieved by various customary conservation practices such as taboos, religious controls and seasonal and social restrictions. In other cases, inadvertent restrictions such as the use of inefficient digging sticks to remove bulbs and roots also prevented over-exploitation.

As general rule, traditional healers and plant gatherers collected according to their need, which usually held the amount harvested at a low levels. Most traditional practitioners still adhere to these traditional conservation practices of plant collection. However, as the collecting and selling of medicinal plants have become highly commercialized, harvesting is often undertaken in destructive

ways. The modernized and highly commercialized herbal industry often leads to efficient but environmentally unfriendly and unsustainable harvesting methods.

This guideline is aimed at supporting traditional medicinal practitioners and will encourage and support the sustainable collection of medicinal plants of good quality in ways that preserve the medicinal plants and the environment. As nature is a fascinating but highly complex system and we have to try to keep it general, adaptation of the guidelines to special site conditions and requirements of special plants will be necessary and shall be conducted on a case-by-case basis.

The guidelines are drawn from our own experiences and those of others in Zimbabwe and international experience was that were provided by the references listed at the end of the publication. The guidelines conform to the principles of 'Caring for Earth' prepared in partnership by IUCN, WWF AND UNEP. They also refer to the Draft International Standard for the Sustainable Wild Collection of Medicinal and Aromatic Plants, which is currently developed by international stakeholders.

This publication seeks to provide general technical guidelines on the sustainable harvesting of medicinal plants. Section two gives an overview of general rules and recommendations for harvesting are given. In the third section, special attention is given to bark, root, leaf and fruit harvesting whilst the fourth section provides some tips for post harvest handling and lastly an overview of sustainable management of medicinal plants is presented in section five. The last two sections have been included in this harvesting guideline as i) the former influences the level of extraction due to loss or wastage in processing and ii) the latter can determine the amount of medicinal plants available for harvesting.

2. General guidelines

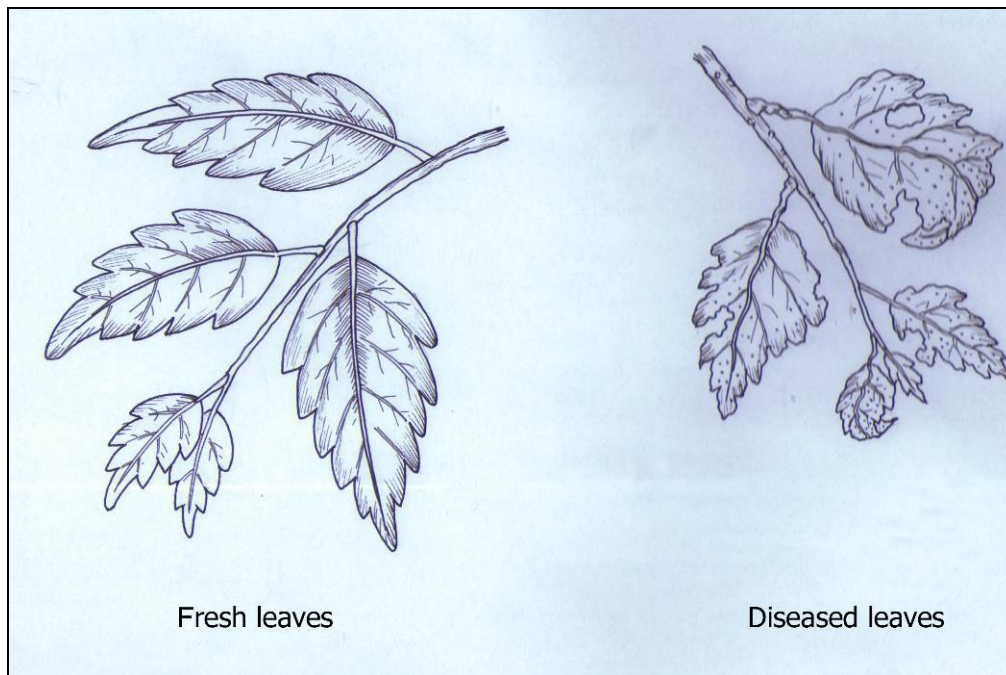
Medicinal plants should be harvested sustainably. 'Sustainability' is a principle that has been used for centuries in forestry and in the management of natural resources and has been simply described as a system *that meets the needs of the present without compromising the ability of future generations to meet their own needs*. This includes timing of harvesting, material to be harvested, harvesting techniques, harvesting equipment and storage.

WHEN to harvest

- Determine the right time for harvesting which will vary from one species to the other. Collect at a time when the plants are in optimum condition with respect to required medical quality and efficacy.
- Determine the best time for collection, e. g. the season, date or time of day, rather according to the quality and quantity of the active ingredients than the total amount of material you can gather. This ensures the best possible quality of raw material and products. The concentration of biologically and medically active ingredients varies with the stage of plant growth and development. This also applies to non-targeted poisonous ingredients. Often, you will be able to rely on a broad range of indigenous knowledge on the appropriate harvesting dates and times.
- Harvest medicinal plants under the best possible climatic conditions for the specific species to avoid either desiccation or fermentation and mould growth and thus deterioration of the material.

WHAT to harvest

- Be sure that you can identify the plants that you intend to harvest without doubt. Distinguish clearly between the medicinal plant and its closely related relatives in order to avoid unwanted mixtures.
- Choose healthy and well-developed plant material. Do not harvest plant material that is infested with fungal growth or insects. This is because by-products of these organisms will alter the ingredient profile and could even be poisonous.

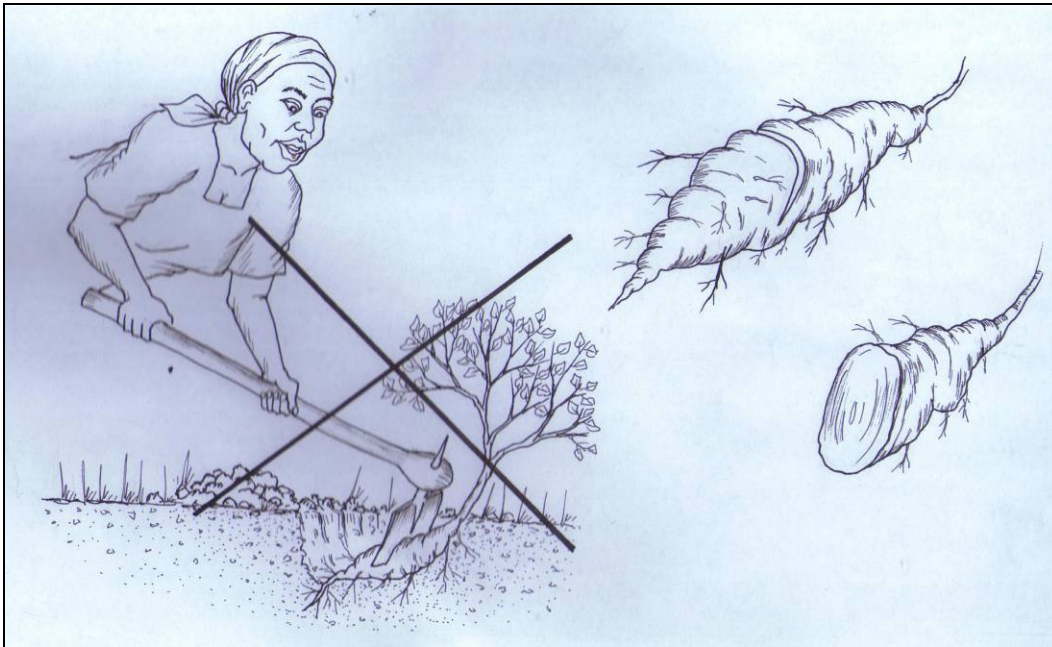


Fresh leaves and diseased leaves

- Be sure the plants you intend to harvest have not been sprayed with pesticides, herbicides, or fertilizers. Be especially aware of this around the edges of farm fields, roadsides, or near industrial activity.

HOW to harvest

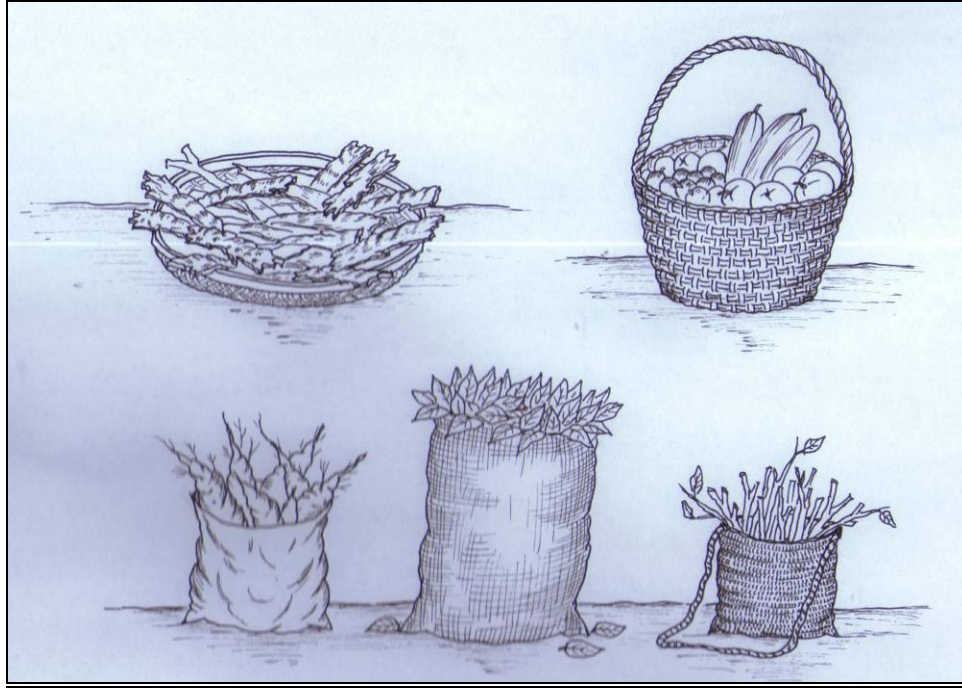
- Gather only plants that are abundant in that area. Be conscientious about leaving a healthy population behind.
- Take special care with leaves and flowers which are much more vulnerable to deterioration than roots due to the nature of their tissue.
- Avoid any unnecessary damage to the plant i.e. exercise caution to enable the plant can re-grow
- Avoid mechanical damage to the harvested material that results in undesirable quality changes.



Severed and damaged bulb

- Identify and discard unwanted plant materials during harvesting this is to ensure that no foreign matter, weeds, or toxic plants are mixed with the harvested medicinal plant materials.

- Put different plant material in different containers.



EQUIPMENT to use

- Make sure that all equipment used is clean and free of remnants of previously harvested plants.
- Keep all containers used during harvesting clean and free from contamination by previously harvested medicinal plants and other foreign matter.
- If plastic containers are used, pay particular attention to any possible retention of moisture that would lead to the growth of moulds.
- When containers are not in use, keep them in dry conditions and in an area that is protected from insects, birds, and other pests.

- In order to reduce the risk, observe carefully whether there are any signs of over-harvest especially, when the plants that you want to collect are in a lower quantity or in a worse condition. Other signs of over-harvesting can be:
 - The distance you have to walk to collect your desired plants increases.
 - The plants do not seem to be in a good condition and/or are infected by pests.
 - Some plants cannot be found locally anymore.



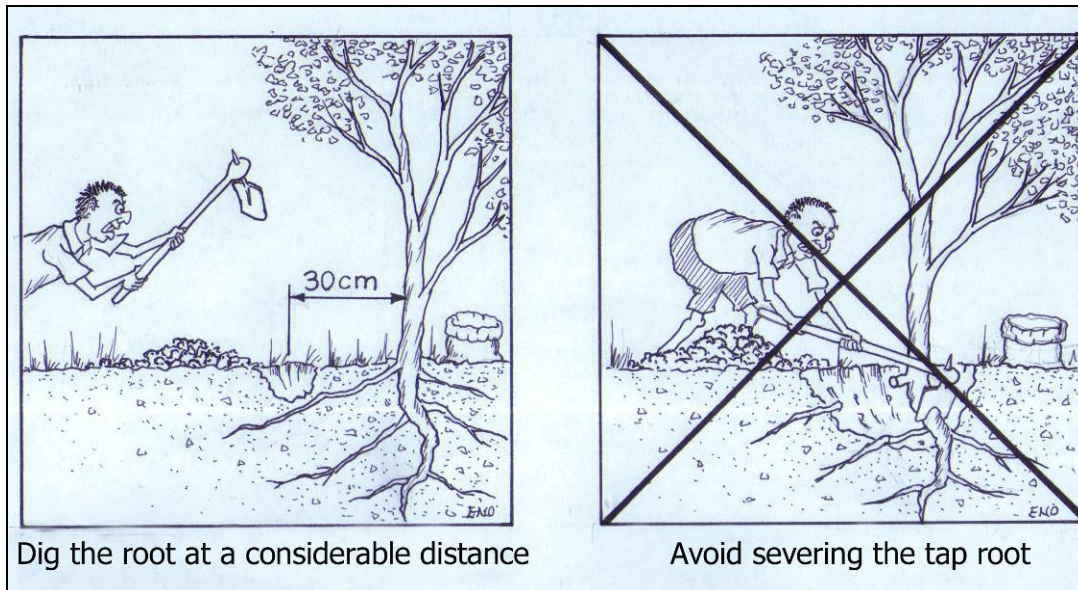
3. Specific guidelines

3.1 Guidelines for root harvesting

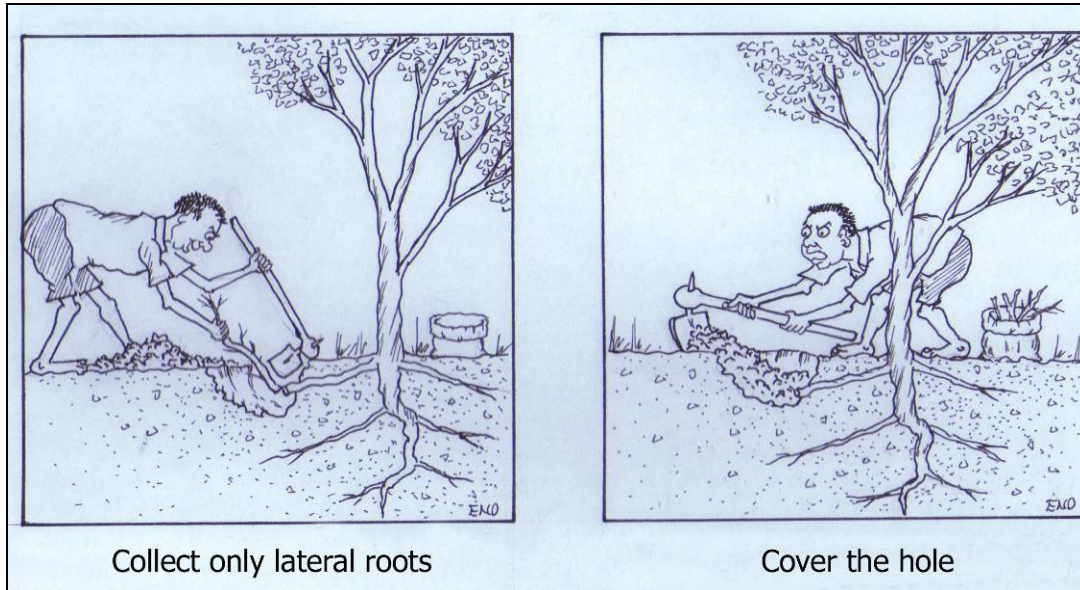
In many medicinal plants, the medically effective substances are found in the root. Thus, in many cases, the whole plant gets uprooted by the gatherers and thus can never grow again. If this technique is used with a high number of plants in a short time, the plant will eventually go extinct

In order to ensure sustainable harvest of root material we recommend you follow these rules:

- Dig the root at a considerable distance, at least 30 cm, from the main stem or tap root.
- Avoid severing of the tap root.



- Collect only the lateral roots.
- After digging cover the hole to ensure protection against infection and invasion by pests.

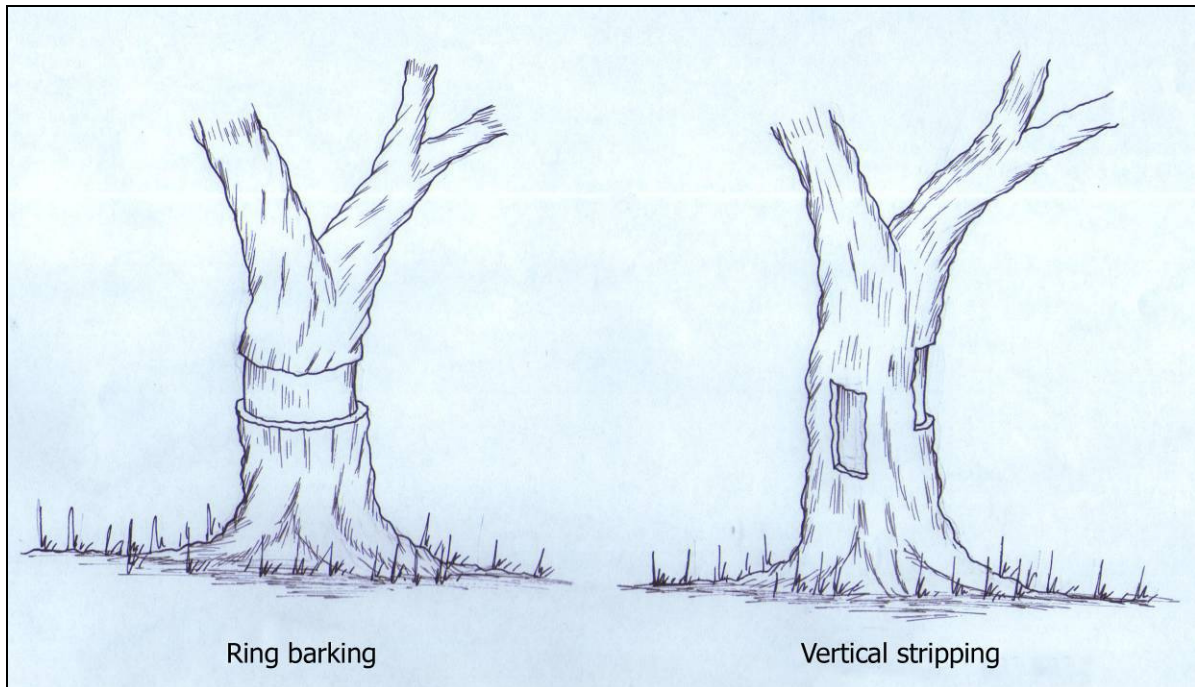


3.2 Guidelines for bark harvesting

Traditionally, bark is harvested with an axe or bush knife. If a particular species is in high demand and intensively used, the plant can become endangered by this technique. The most common unsustainable practice is ring-barking where entire rings of bark are removed around the tree, inevitably leading to death of the tree. In order to ensure sustainable harvest of bark material the following recommendations should be followed:

- Peel the bark from the tree in small pieces leaving most of it intact on the trunk on the East and West side of the tree as has been the tradition.

- Remove the bark in long vertical strips using a thin flexible blade/bush knife.
- Do not practice ring barking, which is the cut of off entire rings around the tree.
- Remove the bark in small sections and leave some inner bark to protect the wood.



- Do not cut the edges of the strip with an axe as this causes the remaining bark to lift from the wood and dry out.
- Possibly use 'tree seal', e. g. apply a piece of wet cow-dung to the bark wound. This will prevent the wound from drying out, though it does not facilitate bark recovery or prevent the development of insect infestation or development of infections on the wound.

3.3 Guidelines for leaf harvesting

In most cases, leaf harvesting is regarded as least destructive form of harvesting to the plants. However, studies revealed that “business as usual” harvesting sometimes resulted in the collection of all the leaves from the tree including cutting down the branches and twigs. In order to ensure sustainable harvesting of leaves it is recommended that one can:



Pluck individual leaves instead of leaf stripping and avoid use of sharp pruning shears for leaves.

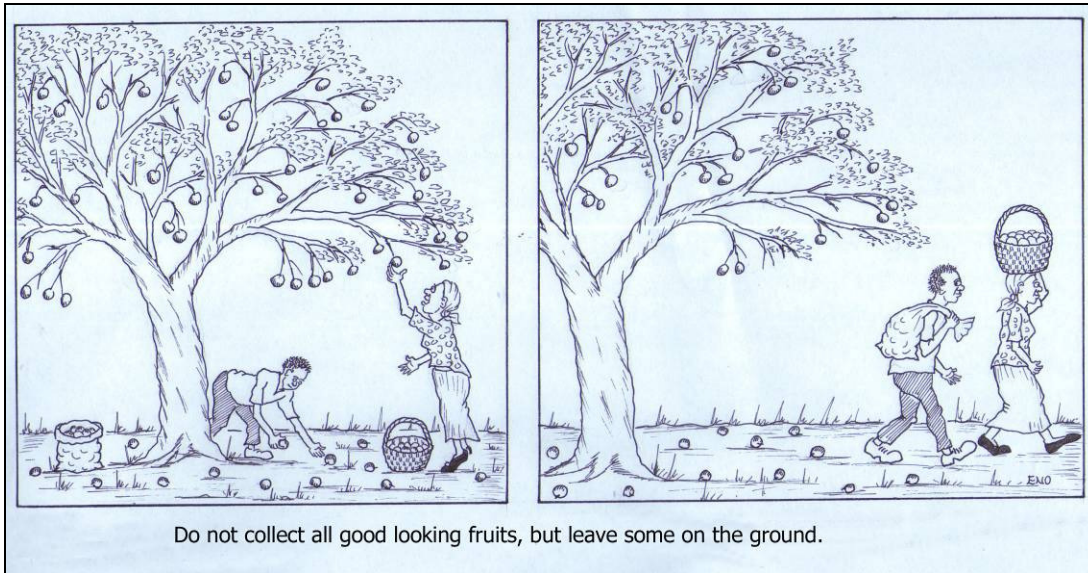


- Regularly prune branches to improve the quality and quantity of leaves.
- Injure a limited number of roots to encourage sprouting of new root suckers.

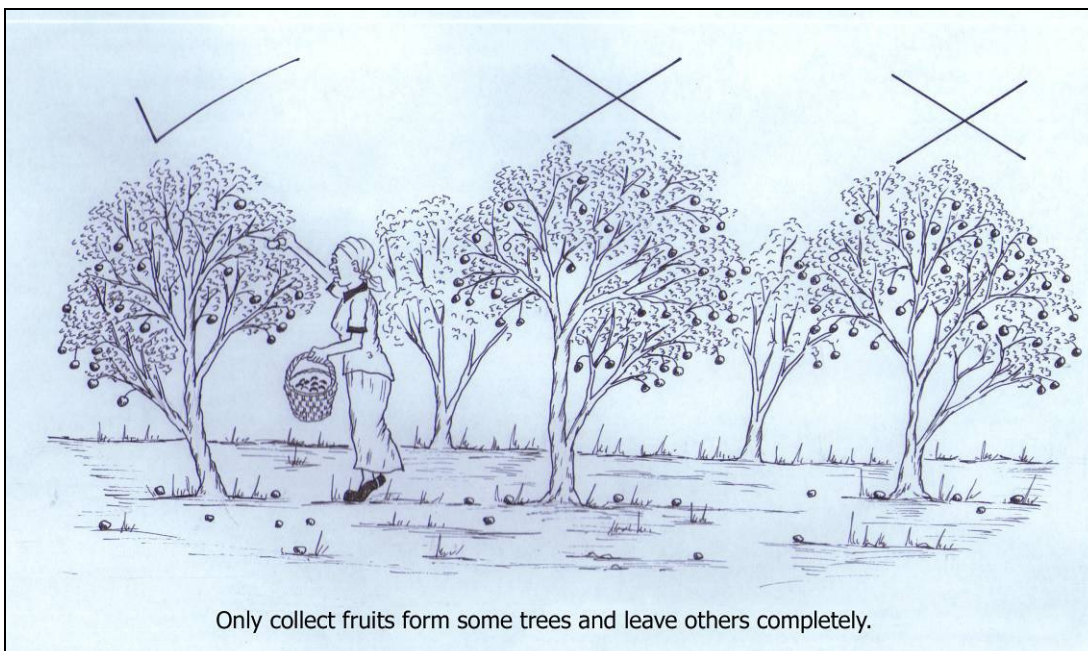
3.4 Guidelines for fruit harvesting

The commercial harvesting of fruits can affect not only species regeneration but also the quality of the resource in an area. This is particularly the case if the fruits and seeds of an inferior quality, such as small and rotten ones, are left to regenerate. Thus, fruits also need to be extracted in a sustainable manner so that the biotic integrity of forests and woodlands is supported. In order to ensure sustainable harvesting of leaves it is recommended to:

- Do not collect all good looking, high quality fruits but leave some on the ground so that more plants of good quality can germinate.



- Only collect fruits from some trees and leave others completely.



4. Post-harvest handling

After harvest, the harvested fresh plant material undergoes a variety of processes which can be either desirable or undesirable. Through the harvesting process, the balance of substances within the plant is disturbed. Such processes are likely to alter the effectiveness of some of the active ingredients. Once the harvesting is done, you should keep in mind the following rules and recommendations in order to ensure a high quality of the harvested material and the products developed:

THINGS TO DO

- Arriving at the place for drying or processing, unload and unpack the plant-material as promptly as possible.
- As soon as you have time to do it, start the appropriate preliminary processing. This could include including inspection, elimination of undesirable materials and contaminants, washing, sorting and cutting.



Sekuru sorting out his harvested plant materials

The inspection may include:

- Visual inspection to make sure that no untargeted medicinal plants and/or plant parts is included,
- Visual inspection for foreign matter,
- Quality evaluation such as: damage, size, color, odor and possibly medical properties,
- Take care to ensure that no foreign matter, weeds, or toxic plants are mixed with the harvested medicinal plant materials.

BUILDING and the EQUIPMENT to use

- Take care that the Building-facilities that you use for drying or processing are clean, well aerated and never used for animal keeping.



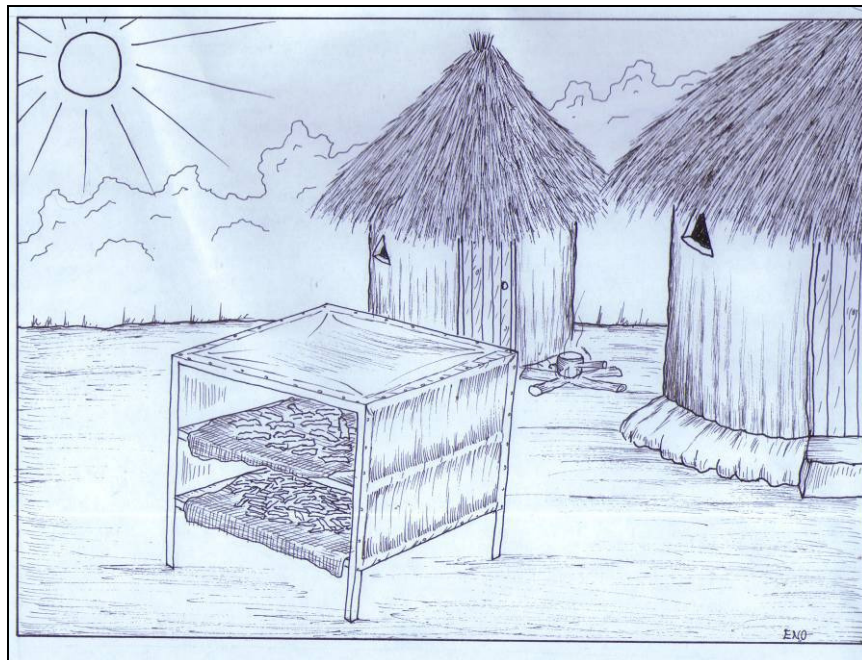
An aerated storeroom

- Make sure that the building-facilities provide protection of the plant-material against pests, rodents, insects and birds as well as against pets and domestic animals.
- Make sure that equipment like drying-frames etc. are clean and regularly serviced.

Have clearly marked waste bins that are kept ready, emptied and cleaned daily.

DRYING

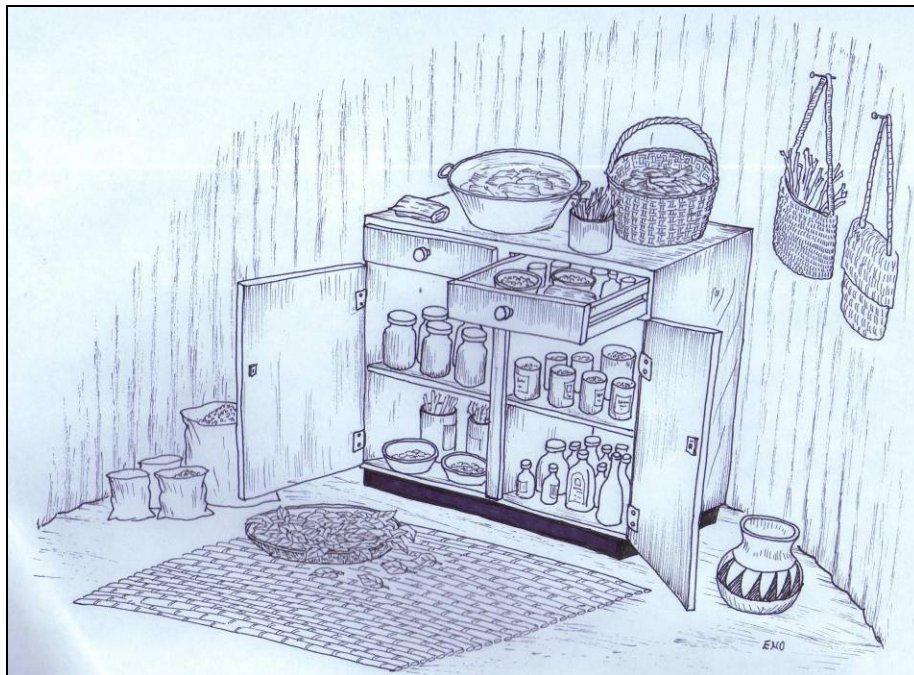
- Give adequate consideration that drying conditions are chosen appropriate to the type of plant-material processed.
- In case of air-drying, spread the plant-material in a thin layer.
- Make sure that the drying frames are located in a sufficient distance from the ground to provide adequate air circulation and facilitate uniform drying.



A solar drier

STORING

- Pack the dried plant-material immediately in bags or containers permitting air exchange in order to reduce the risk of pest attacks and mould.
- Do not store the harvested material in closed and unventilated containers e.g. plastic bags.



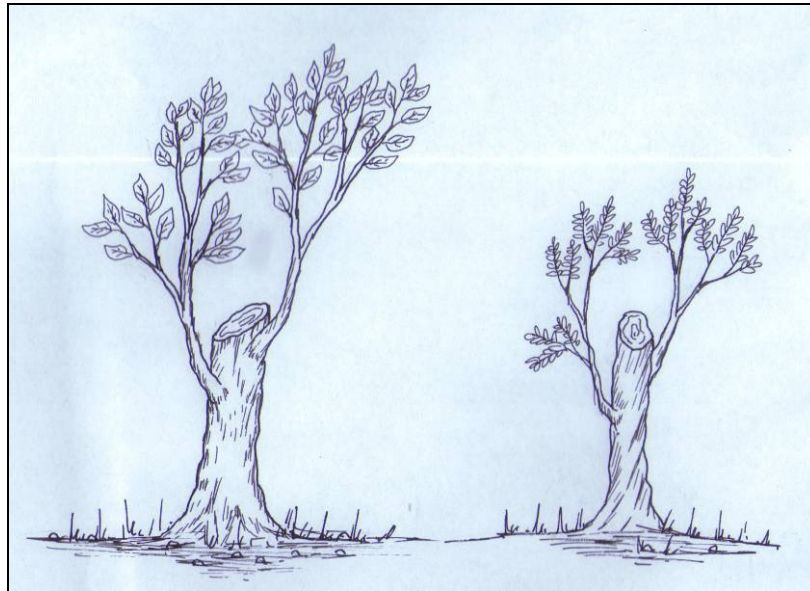
5. Management of medicinal plants

Traditional medicinal plants have been harvested for centuries. However, hardly any documentation of development and/or implementation of management practices have been undertaken. In fact, it is known that some of these species have gone locally extinct and others are endangered. There are also no concerted efforts and measures in place to ensure sustainable supply of medicinal plants in Zimbabwe. Sustainable supply of traditional medicinal plants depends on the proper management and conservation methods. This section gives an overview of some of the strategies that can be used to manage traditional medicinal plants.

Regulation of the collection of plants

To manage levels, techniques and timing of harvesting a system to control access and monitor extraction can be put in place. In such systems permits can be required for the commercial collection of all or some particular plant species. The advantage of a permit system is that, unlike a blanket ban, it gives flexibility to the issuing authority. If the plant is on the verge of extinction permits can be suspended whereas if the plant population is growing, the licensed volume for collection can be increased. It is vital that the regulations take into account the part of the plant being used and its regeneration capacity. Generally, the collection of fruits, flowers and leaves has less adverse immediate impact, whereas the collection of bark, roots, and even whole plants is more likely to be destructive. The regulation should also draw on the harvesting practices observing ethical, legal and social rights of all those concerned in the communities where the plants are native.

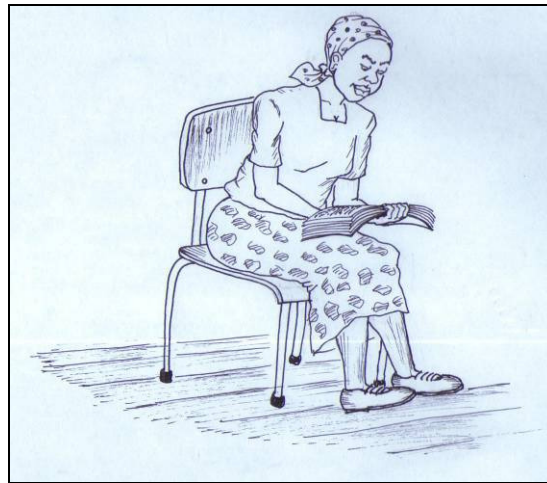
- Management of the coppice regrowth on cut stumps in the forest to support the development of trees with a number of smaller stems for rotational harvesting,



Coppice regrowth

- Encouraging recruitment by covering established seedlings with branches to prevent browsing by browsers,
- Managing planted resources to harvest the leaves instead of the bark where possible as harvesting of leaves is less destructive. This would also reduce the period between planting and resource harvesting.

6. Further reading



In addition to our own experiences, the following publications were used for developing the guidelines.

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