

Mfumo wa 3 - Sehemu ya 1: Vifaa vya kusambaza kwa ajili ya marejesho ya misitu



Welcome to part 1 of Module 3 'sourcing material for forest restoration'.

Karibu sehemu ya 1 ya Module 3 'kuhamasisha vifaa kwa ajili ya marejesho ya misitu'.

Lengo la moduli



Moduli hii inalenga kuhakikisha ufahamu mkubwa wa:

- Aina ya nyenzo ambazo zinaweza kufutwa kutoka kwa mashirika tofauti
- Faida za kukusanya nyenzo zako mwenyewe kwa ajili ya mradi wa kurejesha
- Njia za kuongeza utofauti wa maumbile wakati wa kukusanya mbegu
- Jinsi ya kuangalia ubora wa mbegu
- Kukusanya mbegu ngapi

The aim of this module is to have a greater understanding of the following:

- The type of material which can be sourced from different organisations
- The advantages of collecting your own material for a restoration project
- How to maximise the genetic diversity when collecting seed
- How to check seed quality
- How much seed to collect

Lengo la moduli hii ni kuwa na ufahamu zaidi wa yafuatayo:

- Aina ya nyenzo ambazo zinaweza kufutwa kutoka kwa mashirika tofauti
- Faida za kukusanya nyenzo zako mwenyewe kwa ajili ya mradi wa kurejesha
- Jinsi ya kuongeza utofauti wa maumbile wakati wa kukusanya mbegu
- Jinsi ya kuangalia ubora wa mbegu
- Mbegu ngapi kukusanya

Mahali pa kupata vifaa ?



- **Vitalu vya kibiashara**
- **Vitu vya mbegu za miti**
- **Bustani za Botanic**
- **Bustani za mbegu**
- **Kusanya nyenzo zako mwenyewe**

Where to get material from?

There are a variety of ways in which you can source material for forest restoration projects. These include commercial nurseries, tree seed centres, botanic gardens, seed orchards and you can collect your own material.

Wapi kupata vifaa kutoka?

Kuna njia mbalimbali ambazo unaweza kupata vifaa kwa miradi ya kurejesha misitu. Hizi ni pamoja na vitalu vya biashara, vituo vya mbegu za miti, bustani za mimea ya mimea, bustani za mimea na unaweza kukusanya nyenzo zako mwenyewe.

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- Inatumika kwa aina zaidi ya kawaida
- Kawaida haiwezekani kujua asili ya mimea
- Mimea mara nyingi huwa na utofauti mdogo wa maumbile
- **Mara nyingi, nyenzo zifai kwa marejesho ya kiikolojiakutoka !
kwa vitalu vya biashara ha**

Commercial nurseries can be used as a source of material especially for more common species. However it is important to take into consideration that they often do not provide associated data and it is usually not possible to know the origin of the plant. The majority of material is usually of horticultural origin which is bred from a small gene pool and therefore has a low genetic diversity. As discussed in Module two: selecting species for restoration – low genetic diversity reduces the resilience of your restored forest. **Therefore in many cases, material from commercial nurseries is not suitable for ecological restoration.**

Vitalu vya biashara vinaweza kutumika kama chanzo cha nyenzo hasa kwa aina zaidi ya kawaida. Hata hivyo ni muhimu kuzingatia kwamba mara nyingi hawapati data zinazohusishwa na kwa kawaida haiwezekani kujua asili ya mmea. Wengi wa nyenzo ni kawaida ya asili ya maua ambayo imezalishwa kutoka kwenye kijiji kidogo cha jeni na kwa hiyo ina tofauti tofauti za maumbile. Kama ilivyojadiliwa katika Module mbili: kuchagua aina za kurejeshwa - utofauti mdogo wa maumbile hupunguza ustahimilivu wa misitu yako iliyorejeshwa. Kwa hiyo, katika hali nyingi, nyenzo kutoka kwa vitalu vya biashara hazifa kwa marejesho ya kiikolojia.

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- Takwimu bora za uhamisho kuliko vitalu vya biashara
- Inaweza kukusanya kwa mahitaji
- Hata hivyo miti huchaguliwa kwa ajili ya utendaji wa misitu si kwa ajili ya kurejesha mazingira

Kituo cha Mbegu cha Miti cha KEFRI nchini Kenya, hutoa mbegu kwa aina zaidi ya 150 za asili na za kigeni



Tree seed centres are a great asset to the countries in which they are found, especially if accompanied by long-term seed banks and research programmes. For example, the Kenya Forestry Research Institute's Tree seed Centre specialises in the production of high quality tree seeds of both indigenous and exotic species. Tree seed centres often have better provenance data than commercial nurseries and can enable you to select plants of a local origin if needed. They can often also be contracted to collect seed for your project as they often have in house tree climbing skills which your restoration project team might not have. However it is important to take into consideration that tree seed centres often select trees for forestry performance, i.e. tall and straight trees, limiting the genetic diversity of material collected and thus the resilience of your restored forest.

Vitu vya mbegu za miti ni mali nzuri kwa nchi ambazo hupatikana, hasa ikiwa ni pamoja na benki za mbegu za muda mrefu na mipango ya utafiti. Kwa mfano, Kituo cha Miti cha Utafiti wa Misitu ya Kenya kina mtaalamu katika uzalishaji wa mbegu za miti wa shaba ya aina zote za asili na za kigeni. Vitu vya mbegu za miti huwa na data bora zaidi kuliko vitalu vya biashara na vinaweza kukuwezesha kuchagua mimea ya asili ya asili ikiwa inahitajika. Wanaweza pia kuambukizwa kukusanya mbegu kwa ajili ya mradi wako kama wao mara nyingi wana ujuzi wa kupanda kwa nyumba ambayo timu yako ya urejesho wa mradi inaweza kuwa nayo. Hata hivyo ni muhimu kuzingatia kwamba vituo vya mbegu za miti huchagua miti kwa ajili ya utendaji wa misitu, yaani miti mirefu na ya moja kwa moja, kupunguza uharibifu wa maumbile wa nyenzo

zilizokusanywa na hivyo ustahimilivu wa misitu yako iliyorejeshwa.

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- Kukusanya aina tofauti za aina na rekodi
- Mara nyingi huwa na taarifa juu ya mbinu za uenezi na huduma



Mfano wa itifaki ya uenezi

Prunus africana	
Propagation	
Method	Seed
Soil media	1:3 Sand: loam soil. Need mycorrhiza
Pretreatment	None
Depth sown	3 cm
Environment	Kept in shade until first three months after germination
Expected success rate	Over 70%

Although many botanic gardens historically focused on exotic species, the majority have shifted to a stronger conservation focus. Many botanic gardens have experience of collecting a large variety of native species. As botanic gardens are research institutions with a wealth of botanical and horticultural expertise they often have accompanying information on provenance, propagation and care techniques. For example on the BGCI website, propagation protocols have been developed by Brackenhurst Botanic Gardens in Kenya, Tooro Botanical Gardens in Uganda and the Royal Botanic Garden, Jordan. Botanic gardens may also be able to provide seed or seedlings of threatened species. By incorporating threatened species in your restoration project, you will be helping the conservation of these species.

Ingawa bustani nyingi za botani zimezingatia historia ya kigeni, wengi wamebadilika kuzingatia nguvu ya uhifadhi. Bustani nyingi za botani zina uzoefu wa kukusanya aina mbalimbali za asili. Kama bustani za mimea ni taasisi za utafiti zilizo na utajiri wa utaalamu wa mimea na maua huwa na uhamasishaji wa habari juu ya utangulizi, uenezaji na mbinu za utunzaji. Kwa mfano kwenye tovuti ya BGCI, protocols za uenezi zimeundwa na Bustani za Botanic za Brackenhurst nchini Kenya, bustani za Tooro Botanical nchini Uganda na Bustani ya Botanic ya kifalme, Jordan. Bustani za Botanic pia zinaweza kutoa mbegu au miche ya aina za kutishiwa. Kwa kuingiza aina za kutishiwa katika mradi wako wa kurejesha, utawasaidia uhifadhi wa aina hizi.

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- Mara nyingi kuna mbegu za mbegu au mabenki ya kuhifadhi / kurejesha mbegu
- Kutoa ushauri juu ya aina zinazofaa kwa mazingira fulani ya hali ya hewa na aina za udongo
- Kusanya mahitaji

Bustani za Botanic za Royal Kew's Millennium Seed Bank ina makusanyo zaidi ya 80,000 ya mbegu inayowakilisha aina zaidi ya 37,600!



Many botanic gardens also often have associated seed banks and thus have seed collecting expertise which can be utilised. For example, the Royal Botanic Gardens Kew's Millennium Seed Bank contains more than 80,000 seed collections representing over 37,600 species! Botanic gardens can also provide horticultural advice for example about which species are appropriate for a particular climate and soil conditions, and can provide seed collecting as a consultation service.

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www.bgci.org/plant_search.php

Kituo cha PlantSearch ya BGCI

- Inao kumbukumbu za mimea iliyobaki kwenye bustani ya botani & makusanyo ya benki ya mbegu
- Inaweza kutumiwa kutambua wapi aina za mimea zinafanyika
- Inaweza kutuma ombi la mtandaoni kwa vifaa au habari

BGCI's PlantSearch database (available on the BGCI website):

- Maintains records of plants held in botanic garden and seed bank collections
- Can be used to identify where species are held
- Can send an online request for material or information

GOING TO MAKE VIDEO

Mbegu ya PlantSearch ya BGCI (inapatikana kwenye tovuti ya BGCI):

- Inao kumbukumbu za mimea iliyobaki katika bustani ya botani na makusanyo ya benki ya mbegu
- Inaweza kutumiwa kutambua wapi aina zilizopo
- Inaweza kutuma ombi la mtandaoni kwa vifaa au habari

Mahali pa kupata vifaa ?



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- Mradi mkubwa wa marejesho unahitaji mbegu nyingi!
- Inaweza kutoa ugavi ulioendelea wa nyenzo kwa kuongeza upya upya
- Hasa ni muhimu kwa aina za kutishiwa na mimea chache

Seed orchards are stands planted for the production of seeds. They can be a very useful resource for large scale restoration projects that require a lot of seed. Planting a genetically diverse seed orchard will increase the availability of indigenous tree seed and will reduce reliance on wild sources of material. This can be particularly helpful for threatened species with small populations.

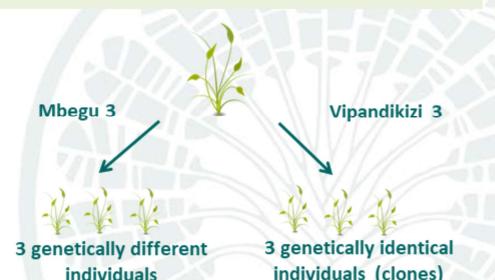
Bustani ya mbegu ni imara iliyopandwa kwa ajili ya uzalishaji wa mbegu. Wanaweza kuwa rasilimali muhimu sana kwa miradi ya kurejesha kwa kiasi kikubwa ambayo inahitaji mbegu nyingi. Kupanda bustani ya mbegu ya mazao itaongeza upatikanaji wa mbegu za asili na itawawezesha kutegemea vyanzo vyenye mwitu. Hii inaweza kuwa na manufaa hasa kwa aina za kutishiwa na watu wadogo.

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- Inaweza kuwa yenyne manufaa sana
- Mbegu, vipandikizi na wildlings zinaweza kukusanya
- Kusanya mbegu inahitaji timu ya wenyne ujuzi
- Mbegu ni bora kwa kukamata tofauti za maumbile



Collecting your own material for a restoration project can be highly advantageous. You will know the origin of the material collected and, by following best practice, you can ensure that you consider genetic diversity when sourcing material. Different types of material can be collected, including seeds, cuttings and wildlings.

Seed collecting requires a skilled team, but it is worthwhile investing in to achieve the best results for ecological restoration. This is because seed is best for capturing genetic diversity. For example, three seeds from one plant can produce 3 genetically different individuals, whereas three cuttings from one plant will produce 3 genetic clones of the mother plant. Wildlings should only be taken if the species of interest is not producing seed, then you can collect a small number of wildlings and plant them in a botanic garden or ex situ collection to establish a seed orchard.

Kukusanya nyenzo zako mwenyewe kwa ajili ya mradi wa kurejesha inaweza kuwa na manufaa sana. Utajua asili ya nyenzo zilizokusanya na, kwa kufuata mazoezi bora, unaweza kuhakikisha kuwa unachunguza utofauti wa maumbile wakati ukiangalia vifaa. Aina tofauti za vifaa zinaweza kukusanya, ikiwa ni pamoja na mbegu, vipandikizi na wildlings.

Kusanya mbegu inahitaji timu ya ujuzi, lakini ni muhimu kuwekeza katika kufikia matokeo bora ya kurejesha mazingira. Hii ni kwa sababu mbegu ni bora kwa kuzingatia utofauti wa maumbile. Kwa mfano, mbegu tatu kutoka kwenye mmea

mmoja zinaweza kuzalisha mimemea 3 tofauti, wakati vipandikizi vitatu kutoka kwenye mmea mmoja watazalisha clones 3 za maumbile ya mmea wa mama. Wildlings inapaswa kuchukuliwa tu kama aina ya maslahi haipati mbegu, basi unaweza kukusanya idadi ndogo ya wildlings na kupanda katika bustani botanic au ukusanyaji ex situ ili kuanzisha bustani ya mbegu.

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Wildlings lazima tu kuchukuliwa kama aina ya lengo si kuzalisha mbegu!

Wildlings should only be taken if the species of interest is not producing seed, then you can collect a small number of wildlings and plant them in a botanic garden or *ex situ* collection to establish a seed orchard.

Wildlings inapaswa kuchukuliwa tu kama aina ya maslahi haipati mbegu, basi unaweza kukusanya idadi ndogo ya wildlings na kupanda katika bustani botanic au ukusanyaji *ex situ* ili kuanzisha bustani ya mbegu.

Kukusanya mbegu



Collecting seed

When collecting seed it is important to consider:

- How to maximise the genetic diversity
- How to check seed quality
- And how much seed to take

We will now look at this different aspects in detail.

Kukusanya mbegu

Wakati wa kukusanya mbegu ni muhimu kuzingatia:

Jinsi ya kuongeza utofauti wa maumbile

Jinsi ya kuangalia ubora wa mbegu

Na mbegu ni kiasi gani

Sasa tutaangalia mambo haya tofauti kwa undani.

Kutathmini watu



Idadi ya watu ni kundi la watu ambao wana uwezo wa kuingiliana na kuchukua nafasi ya eneo la kijiografia.

- Hakuna mtiririko wa jeni kati ya watu tofauti
- Watu tofauti walitengwa na vikwazo vyta kijiografia



→ Ili kuongeza nyenzo za asili za asili kutoka kwa watu wengi!

Assessing a population

A population is a group of individuals that are capable of interbreeding and occupy a defined geographical area. There is no gene flow between different populations and they are usually separated by geographical barriers. To maximise genetic diversity, material should be sourced from multiple populations.

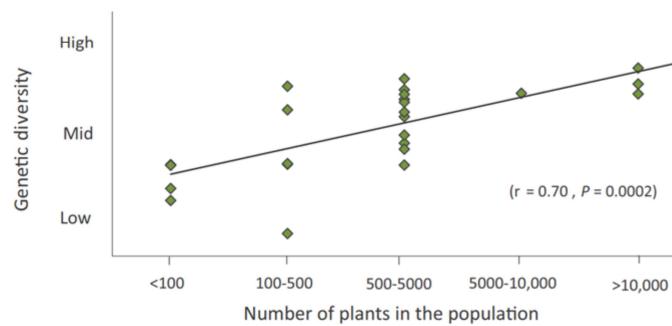
Kutathmini idadi ya watu

Idadi ya watu ni kundi la watu ambao wana uwezo wa kuingiliana na kuchukua nafasi ya eneo la kijiografia. Hakuna mtiririko wa jeni kati ya watu tofauti na kwa kawaida hutengwa na vikwazo vyta kijiografia. Ili kuongeza utofauti wa maumbile, nyenzo zinapaswa kufutwa kutoka kwa watu wengi.

Kutathmini watu



Ufafanuzi
wa asili
huongezek
a kwa
ukubwa
wa idadi
ya mimea



Basey, A.C., Fant, J.B. and Kramer, A.T. (2015). Producing native plant materials for restoration: 10 rules to collect and maintain genetic diversity. *Native Plants Journal*, 16, 37–52.

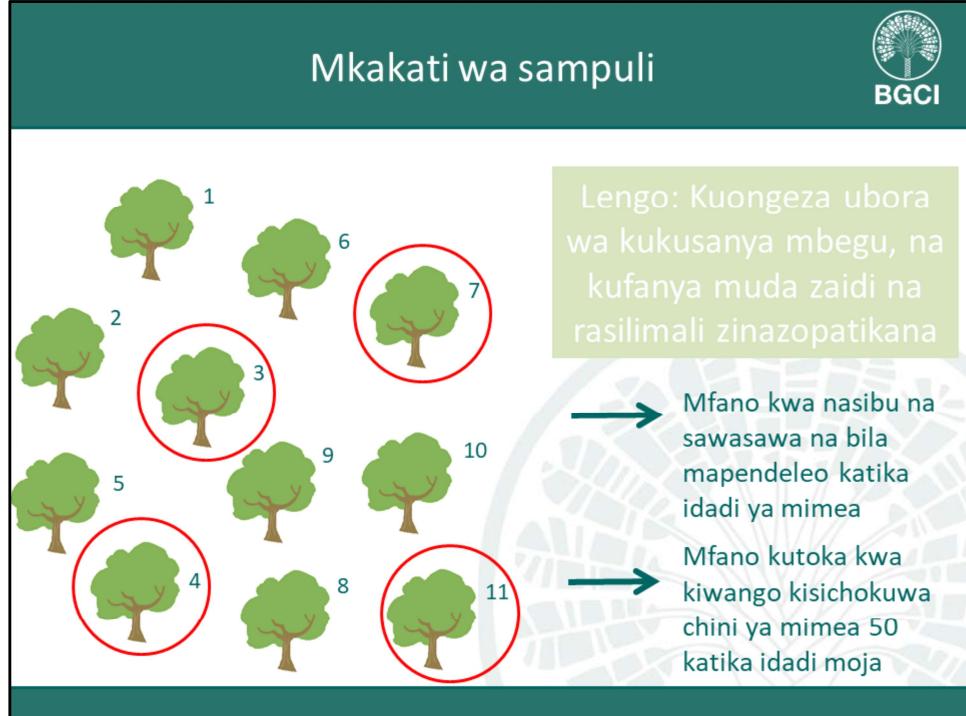


Mfano wa idadi kubwa ya mimea!

Research has found that genetic diversity tends to increase with population size. Therefore it is important to collect seed from large populations of the target species.

Utafiti umegundua kwamba utofauti wa maumbile unaongezeka na ukubwa wa idadi ya mimea. Kwa hivyo ni muhimu kusanya mbegu kutoka kwa mimea mengi na lengo kwa aina kadhaa.

Mkakati wa sampuli

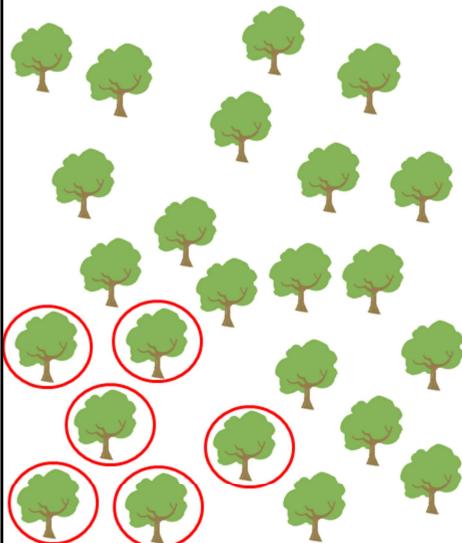


Sampling strategy within the target population.

The aim of the sampling strategy should be to maximise the quality of the seed collection, making the most of the time and the resources available. Sample randomly and evenly across a population, aiming to collect seed from a minimum of 50 individuals within a single population.

Mkakati wa sampuli ndani ya idadi ya watu.

Lengo la mkakati wa sampuli linapaswa kuwa kuongeza ubora wa ukusanyaji wa mbegu, na kuchukua fursa ya muda zaidi pamoja na rasilimali zinazopatikana. Kusanya sampuli bila mapendeleo na sawasawa katika idadi ya mimea, kwa lengo la kukusanya mbegu kutoka kwa kiwango isiyokuwa chini ya watu 50 ndani ya idadi moja.



Point sampling

=

Sampuli kitone

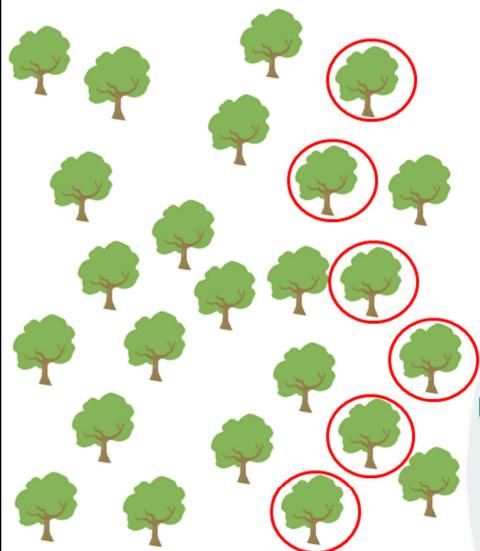
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**utofauti wa chini wa
maumbile**

It is important to capture as much genetic diversity as possible. Not all sampling methods capture the same amount of genetic diversity for example point sampling and conducting transects are not as effective as grid and random sampling.

Ni muhimu kukamata tofauti nyingi za maumbile iwezekanavyo. Sio mbinu zote za sampuli zinazotumia kiasi sawa cha utofauti wa maumbile kwa mfano sampuli kitone na kufanya transecti sio sawa kama gridi na sampuli isiyo na mapandekezo.

Mkakati wa sampuli



Transects

=

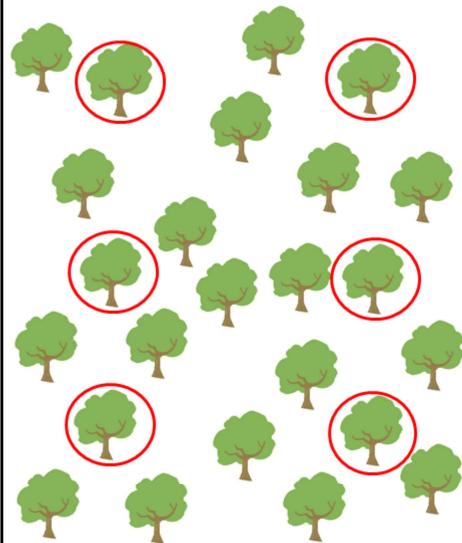
Transecti

=

utofauti wa maumbile

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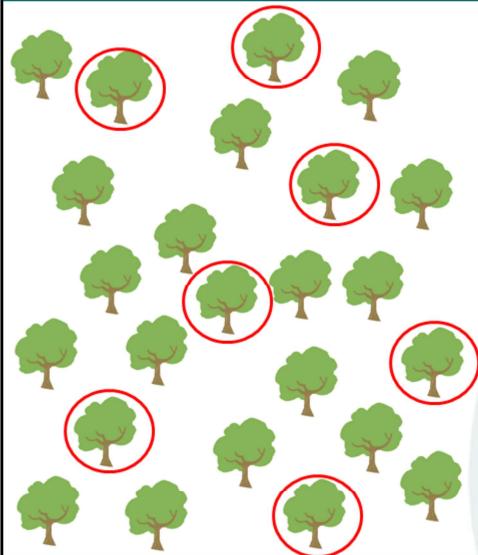
Grid sampling

Sampuli ya Gridi

utofauti wa maumbile

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Ni muhimu kukamata tofauti nyingi za maumbile iwezekanavyo. Sio mbinu zote za sampuli zinazotumia kiasi sawa cha utofauti wa maumbile kwa mfano mfano wa sampuli na kufanya transects sio sawa kama gridi na sampuli ambayo haijahamishika.



Random sampling

=

**Sampuli ambayo
haijahamishika**

=

**utofauti wa
maumbile**

It is important to capture as much genetic diversity as possible. Not all sampling methods capture the same amount of genetic diversity for example point sampling and conducting transects are not as effective as grid and random sampling.

Ni muhimu kukamata tofauti nyingi za maumbile iwezekanavyo. Sio mbinu zote za sampuli zinazotumia kiasi sawa cha utofauti wa maumbile kwa mfano, mfano wa sampuli na kufanya transctei sio sawa kama gridi na sampuli ya random.

Mkakati wa sampuli



Umbali wa nafasi ni muhimu katika ngazi zote za kupata tofauti nyingi

- Idadi ya watu wanapaswa kuwa mbali
- Mimea iliyopangwa ndani ya idadi ya watu inapaswa kuwa mbali
- Mbegu za sampuli zinapaswa kukusanywa kutoka sehemu mbalimbali za mmea



Spatial distance is also important at all levels of sampling for capturing the greatest amount of genetic diversity.

- Sampled populations and sampled plants within a population should be distant. Sampled **seeds** should be collected from different parts of the plant. This is particularly important for large plants such as trees as they are likely to have been pollinated by different paternal plants.

Umbali wa nafasi ni muhimu pia katika ngazi zote za sampuli kwa kupokea kiasi kikubwa cha utofauti wa maumbile.

- Wakazi wa sampuli na mimea ya sampuli ndani ya idadi ya watu wanapaswa kuwa mbali. Mbegu za sampuli zinapaswa kukusanywa kutoka sehemu mbalimbali za mmea. Hii ni muhimu kwa mimea kubwa kama miti kama inawezekana yamekuwa na mimea na mimea tofauti za baba.

Mkakati wa sampuli



Mikusanyiko haipaswi kuepuka wala kuchagua ...



Jaribu kuwa bila mapendeleo iwezekanavyo



Sampling should be random – therefore when making a collection you should neither avoid nor select:

- Less robust looking individuals
- Difficult to access areas
- Plants that look different and have unique growth forms

Try to be as unbiased as possible to capture as much of the genetic diversity as possible.

Sampuli inapaswa kuwa nasibu - kwa hiyo wakati wa kufanya mkusanyiko usipaswi kuepuka wala kuchagua:

- Watu wachache sana wanaotafuta
- Ni vigumu kufikia maeneo
- Mimea ambayo inaonekana tofauti na ina aina za ukuaji wa kipekee

Jaribu kuwa bila mapendeleo iwezekanavyo kukamata kiasi cha utofauti wa maumbile iwezekanavyo.

Mkakati wa sampuli



Ni mbegu ngapi unalenga kukusanya?

- Inategemea malengo na ukubwa wa tovuti ya kurejesha
- Upatikanaji wa aina za lengo
- Mkusanyiko wa angalau 20,000 mbegu itawawezesha matumizi makubwa ya ukusanyaji
 - ✓ Ilipandwa
 - ✓ Ilihifadhiwa
 - ✓ Kusambazwa



→ **Usikusanye zaidi ya asilimia 20 ya mbegu zilizokomaa zinazopatikana wakati wa kukusanya !**

How many seeds to collect is very much dependent of the aims and size of a restoration site as well as the availability of your target species. A collection of at least 20,000 seeds will allow the greatest possible use of the collection, i.e. allowing for some seed to be planted this season, some seed to be stored for future use, and some seed to be distributed to botanic gardens for ex situ conservation. Large quantities of seed can be collected easily for species producing a lot of seed. However, for some species only a small amount of seed will be available, in which case multi-year collections are advised.

The most important thing to remember is to never collect more than 20% of available seed

Mbegu ngapi za kukusanya ni tegemezi kubwa sana ya malengo na ukubwa wa tovuti ya kurejesha pamoja na upatikanaji wa aina zako za lengo. Mkusanyiko wa angalau mbegu 20,000 itawawezesha matumizi makubwa ya ukusanyaji, yaani kuruhusu mbegu zilizopandwa msimu huu, mbegu nyingine zihifadhiwe kwa ajili ya matumizi ya baadaye, na baadhi ya mbegu za kusambazwa kwa bustani za botani kwa hifadhi ya ex situ . Mbegu nyingi za mbegu zinaweza kukusanya kwa urahisi kwa aina zinazozalisha mbegu nyingi. Hata hivyo, kwa baadhi ya aina tu ndogo ya mbegu itakuwa inapatikana, ambapo kesi ya makusanyo ya miaka mingi wanashauriwa.

Jambo muhimu zaidi kukumbuka ni kamwe usikusanye zaidi ya asilimia 20 ya mbegu

zilizopo

Mkakati wa sampuli



Kwa aina ya kutishiwa na nadra (<50 watu):

- Kusanya kutoka kwa watu wote wanaopatikana
- 10-15% mbegu zilizopo
- Kuanzisha bustani ya mbegu
- Je, makusanyo ya miaka mingi

Kamwe usikusanye kiwango kinachozidia!



Only collect seed from threatened species if you have been trained to do so. Otherwise you may be harming the plants, or hindering their ability to reproduce naturally.

For threatened species with less than 50 individuals remaining in the wild. It is important to:

- Collect from all available individuals and aim to collect only 10-15% of available seed
- Establish a seed orchard to supply a source of seed
- Multi-year collecting may be necessary to achieve a good-sized seed collection

It is essential not to over collect!

Tu kukusanya mbegu kutoka aina ya kutishiwa ikiwa umefundishwa kufanya hivyo. Vinginevyo unaweza kuumiza mimea, au kuzuia uwezo wao wa kuzaa kwa kawaida.

Kwa aina za kutishiwa na chini ya watu 50 waliobaki katika pori. Ni muhimu kwa: Kukusanya kutoka kwa watu wote wanaopatikana na lengo la kukusanya tu 10-15% ya mbegu zilizopo

Kuanzisha bustani ya mbegu ili kutoa chanzo cha mbegu

Mkusanyiko wa miaka miwili inaweza kuwa muhimu ili kufikia mkusanyiko wa mbegu nzuri

Ni muhimu kutokusanya kiwango kinachozidia!

Asjli na hali ya hewa - uhakikisho?



Daima kuhakikisha kwamba hati ya nyenzo zilizokusanya !



Nyenzo kutoka ndani ya nchi VS Nyenzo kutoka eneo kubwa

Provenance and climate-proofing restoration.

It is important to think about where you source your material from. When sourcing material it is very important to always record the provenance of your material.

There is an ongoing debate about whether to plant only locally sourced material or material from a larger area to incorporate more genetic diversity, e.g. collecting material from warmer areas to try climate-proof your restoration project. It is up to each restoration project to decide what approach they will use.

Upatikanaji na urejeshaji wa hali ya hewa.

Ni muhimu kufikiri juu ya mahali nyenzo hutoka. Unapotafuta nyenzo ni muhimu sana kurekodi daima utunzi wa nyenzo zako.

Kuna mjadala unaoendelea kuhusu kupanda mimea tu au vitu kutoka eneo kubwa ili kuingiza utofauti wa maumbile, k.m. kukusanya nyenzo kutoka maeneo ya joto ili kujaribu ushahidi wa hali ya hewa mradi wako wa kurejesha. Ni juu ya kila mradi wa kurejesha kuamua njia ambayo watatumia.

Tathmini ya utayarishaji wa kukusanya



Aina tofauti za matunda zinaonyesha ukali kwa njia tofauti



Mabadiliko katika rangi ya matunda



Kupasua tunda



Baadhi ya mbegu tayari wameenea



Matunda na mbegu ni ngumu na kavu

Assessing readiness for collection

Seed must be collected at the optimum stage of development to maximise chances of germination, as well as longevity in long-term storage. Different types of fruits display ripeness in different ways. Some key things to look out for are:

- Changes in fruit colour
- Splitting of fruit
- Whether seeds have already started to be dispersed
- Whether fruit and seed are hard and dry

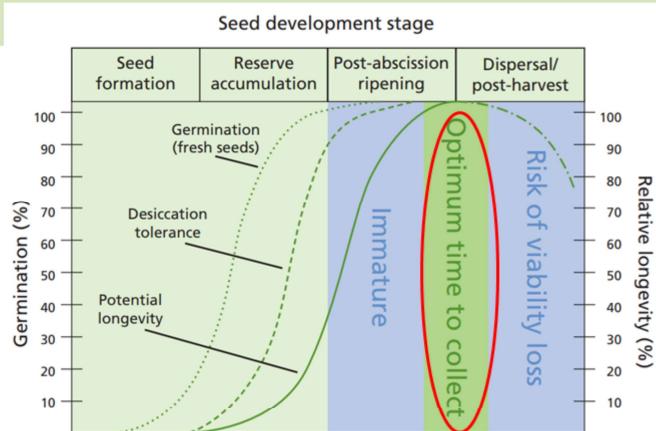
Tathmini ya utayarishaji wa kukusanya

- Mbegu lazima zikusanyike kwenye hatua nzuri ya maendeleo ili kuongeza uwezekano wa kuota, pamoja na muda mrefu wa kuhifadhi muda mrefu. Aina tofauti za matunda zinaonyesha ukali kwa njia tofauti. Baadhi ya mambo muhimu ya kuangalia ni:
 - Mabadiliko katika rangi ya matunda
 - Kupasua matunda
 - Ikiwa mbegu tayari zimeanza kutawanyika
 - Kama matunda na mbegu ni vigumu na kavu

Tathmini ya utayarishaji wa kukusanya



Lengo: Kusanya mbegu karibu na utawanyiko wa asili iwezekanavyo



Way, M. and Gold, K. (2014). Seed collecting techniques. Technical Information Sheet_03, Royal Botanic Gardens, Kew, United Kingdom.

Try to collect seed as close as possible to the point when the plant is naturally dispersing its seed. Seeds collected before or after this stage may not germinate or may not maintain viability when stored for future use.

Jaribu kukusanya mbegu kwa karibu iwezekanavyo mpaka wakati mmea hupanda mbegu yake kwa kawaida. Mbegu zilizokusanya kabla au baada ya hatua hii haiwezi kuimarisha au haiwezi kudumisha uwezekano wakati kuhifadhiwa kwa matumizi ya baadaye.

Tathmini ubora wa kimwili wa mbegu

Baadhi ya familia za kupanda hususan kukabiliwa na:

- Uharibifu wa wadudu
- Mbegu tupu



Jaribio la kukata

- ✓ Afya
- Utayarishaji
- Upatikanaji

Collecting healthy seed

It is necessary to assess the physical quality of seeds. Some plant families have high levels of non-viable seeds, e.g. they may be particularly prone to insect damage or having empty seeds.

A cut test is a simple and reliable technique for assessing the health, readiness and availability of seed:

To carry out a cut test:

- Cut around 10 seeds from several well spaced individuals in the population.
- If seeds are small use adhesive tape to hold them during sectioning and use a hand lens to view them.
- Make a record of empty, infested, immature and aborted seeds.
- Use this information to determine how many seeds you will need to collect to achieve your target number. E.g. if you aim to collect 100 seeds, but the cut test shows that 2 our of 10 seeds are empty, you will need to collect more than 100 seeds to account for empty seeds.

- Submit this data alongside the field data if a collection is made.

Kukusanya mbegu nzuri

Ni muhimu kupima ubora wa mbegu. Baadhi ya familia za kupanda zina kiwango cha juu cha mbegu ambazo haziwezekani, k.m. huenda ikawa hasa huharibika na uharibifu wa wadudu au kuwa na mbegu tupu.

Uchunguzi wa kukata ni mbinu rahisi na ya kuaminika kwa kutathmini afya, utayari na upatikanaji wa mbegu:

- Ili kufanya jaribio la kukata:
- Kata karibu na mbegu 10 kutoka kwa watu kadhaa walioachwa vizuri katika idadi ya watu.
- Ikiwa mbegu ni ndogo ya kutumia adhesive mkanda kuwashikilia wakati wa kugawanya na kutumia lens mkono kuona yao.
- Fanya rekodi ya mbegu tupu, zilizoathiriwa, za mbegu zilizosababishwa na zilizopigwa.
- Tumia maelezo haya ili ueleze mbegu ngapi unahitaji kukusanya kufikia namba yako ya lengo. E. ikiwa unalenga kukusanya mbegu 100, lakini mtihani wa kukataa unaonyesha kwamba 2 yetu ya mbegu 10 haijapungukiwa, unahitaji kukusanya mbegu zaidi ya 100 kuhesabu kwa mbegu zilizopunguzwa.
- Tuma data hii pamoja na data ya shamba ikiwa mkusanyiko unafanywa.

Kukusanya mbegu nzuri



- Kata wazi c. Mbegu 10
 - kutoka kwa watu kadhaa walioachwa vizuri katika idadi ya mimea
 - Ikiwa mbegu ni ndogo
 - tumia mkanda wa kushikamana
 - Lens ya mkono ili kuona



Unahitaji kukusanya mbengu ngapi?

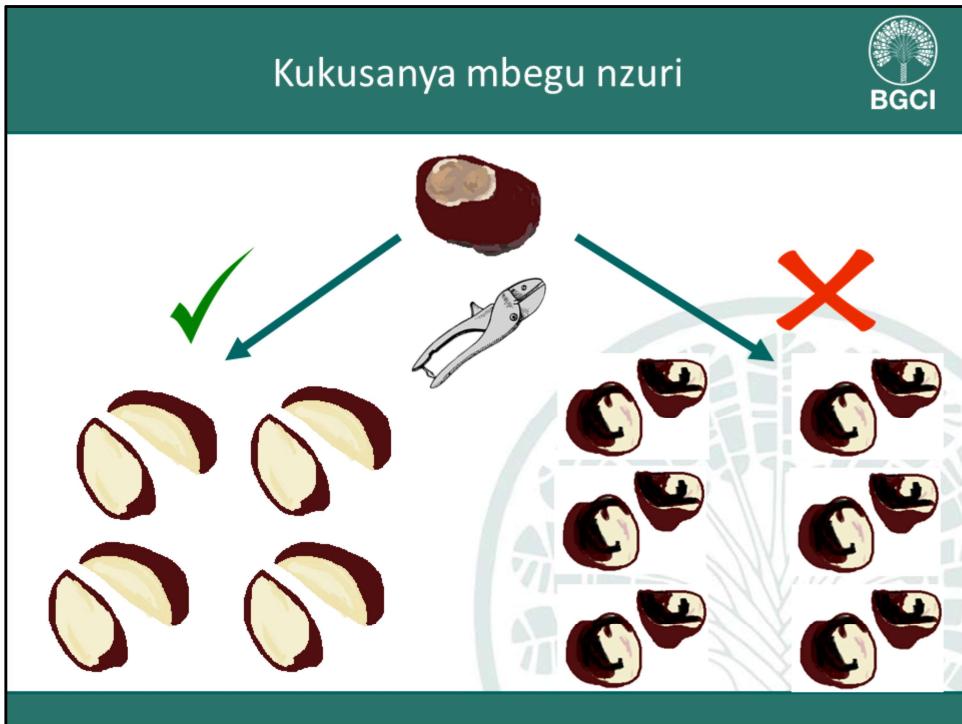
To carry out a cut test:

- Cut around 10 seeds from several well spaced individuals in the population.
- If seeds are small use adhesive tape to hold them during sectioning and use a hand lens to view them.
- Make a record of empty, infested, immature and aborted seeds.

Kufanya jaribio wa kukata:

- Kata karibu na mbegu 10 kutoka kwa watu kadhaa walioachwa vizuri katika idadi ya watu.
- Ikiwa mbegu ni ndogo ya kutumia adhesive mkanda kuwashikilia wakati wa kugawanya na kutumia lens ya mkono kuona yao.
- Fanya rekodi ya mbegu tupu, zilizoathiriwa, mbegu zilizotoka kabla ya kukomaa pamoja na zile ambazo zilikufa kabla ya kukomaa na kutolewa.

Kukusanya mbegu nzuri



- Use this information to determine how many seeds you will need to collect to achieve your target number. If you aim to collect 100 seeds, but the cut test shows that **6 out of 10 seeds** as shown in this example, are infested, you will need to collect more than 100 seeds to account for empty seeds.
- Submit this data alongside the field data if a collection is made.
- Tumia maelezo haya ili ueleze mbegu ngapi unahitaji kukusanya kufikia namba yako ya lengo. Ikiwa unalenga kukusanya mbegu 100, lakini mtihani wa kukata unaonyesha kuwa mbegu 6 katika 10 kama ilivyoonyeshwa katika mfano huu, zimeathiriwa, unahitaji kukusanya mbegu zaidi ya 100 kwa akaunti kwa mbegu tupu.
- Tuma data hii pamoja na data ya shamba ikiwa mkusanyiko utafanywa.



Mbinu za kukusanya mbegu na utunzaji wa baada ya kuvuna

(part 2...)



Connecting People • Sharing Knowledge • Saving Plants

Our Mission is to mobilise botanic gardens and engage partners in securing plant diversity for the well-being of people and the planet

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