# “Edible native plants of Guatemala”

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FLAAR MESOAMÉRICA

# Program

Characteristics of Megadiverse countries

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What is a ntive plant?

A Little history High

kitchen

Food sacurity

Why are there so many malnutrition problems in Guatemala?

Changes in eating patterns

Effects of dietary changes

Use of native plants

Reforestation with native plants

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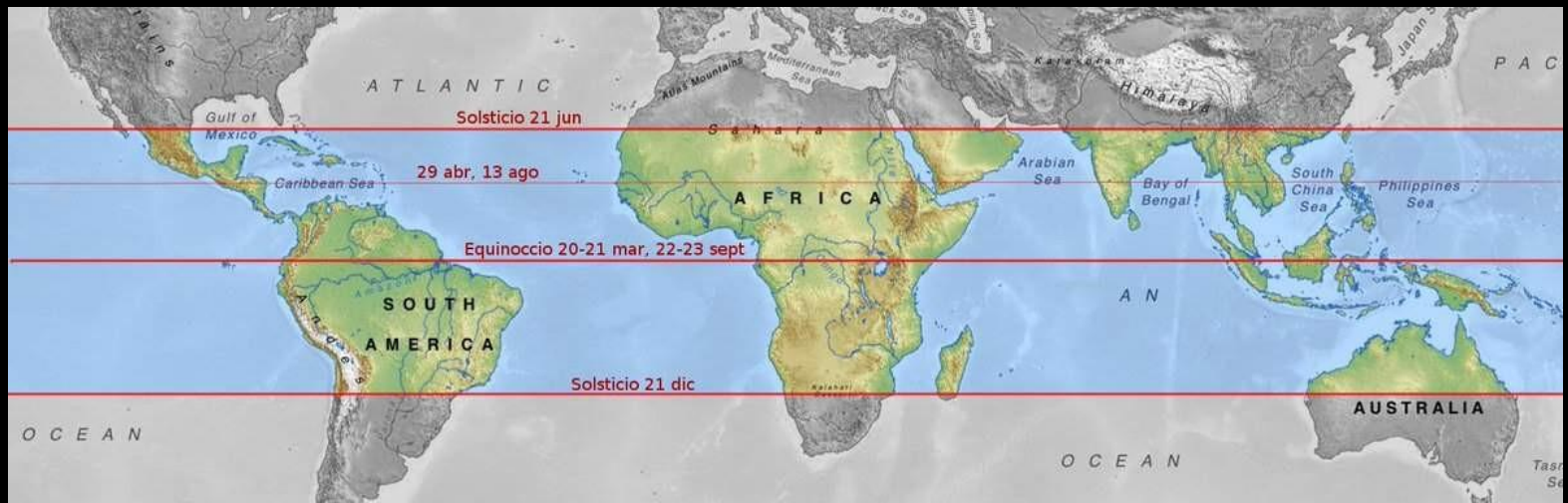
# Guatemala Megadiverse

# Characteristics of Megadiverse countries

According to the Monitoring Center of World Conservation, a megadiverse country has:

- At least 5,000 endemic plants.
- Marine ecosystems within its borders.
- Geographical position
- Diversity of landscapes
- Culture



It is a country rich in culture, represented in traditional knowledge that different ethical groups have perfected over the years..

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# To remember:

## What is a plant?

- Multicellular
- Photosynthetics
- They have chloroplasts
- They are fixed to the ground

# What is a native plant?

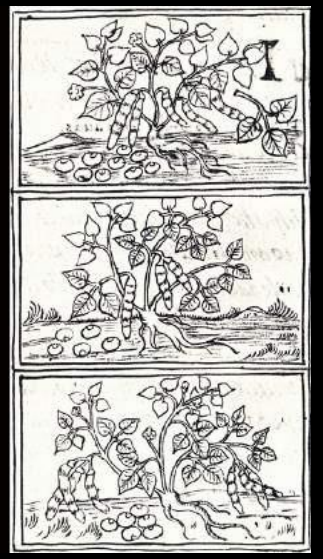
Native: It means to be native to a certain region or ecosystem. They are found in that region as a result of nature without anthropogenic interventions.

Exotic species: Native species from other regions that have been introduced to certain areas.

Chipilín (*Crotalaria longirostrata*)

The richness of plants and the cultural development of Central America have made extremely important contributions to the food security of humanity.

* Maize (*zea mays*)
* Bean (*Phaseolus spp)*
* Cacao (*Theobroma cacao*)
* Chilli (*capsicum spp*)



# A Little history

It is very likely that our ancestors, the first colonizers of Mesoamerica, arrived from the Asian continent approximately 40 thousand years ago crossing the Bering Strait.

Later they dispersed throughout the American continent


# A Little history

In the beginning the populations were groups of nomadic hunters, gatherers and fishermen who constantly moved in search of resources.

The development of agriculture was a crucial stage in the development
of culture since the new societies stopped being nomads and settled in fixed places.
A closer relationship with biodiversity was established


Cincalco o milpa. Códice Vindobonensis, lám. 11. Reprografía: Gerardo Montiel Klint / Raíces

# A Little history

Native species that began to be the main source to satisfy their primary needs.

Maize plant (*Zea mays*) illustration by Katherinne Herrera

# A little history

One of the centers of origin of agriculture was Mesoamerica.

Of the most important events, the domestication of Corn (Zea mays) stands out, which constituted the food base of the populations.

Photo by FLAAR Mesoamerica

# A Little history

There is also evidence of extensive cultivation of cassava (yucca sp.) Shortly after the domestication of corn.

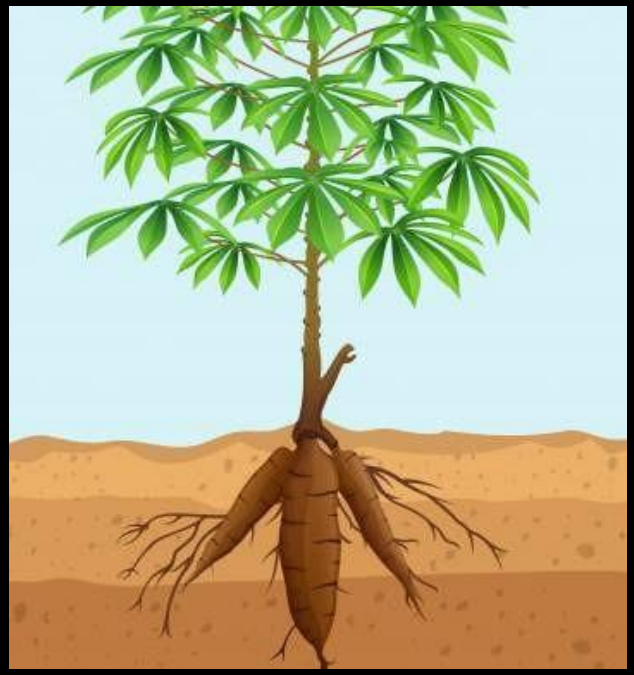
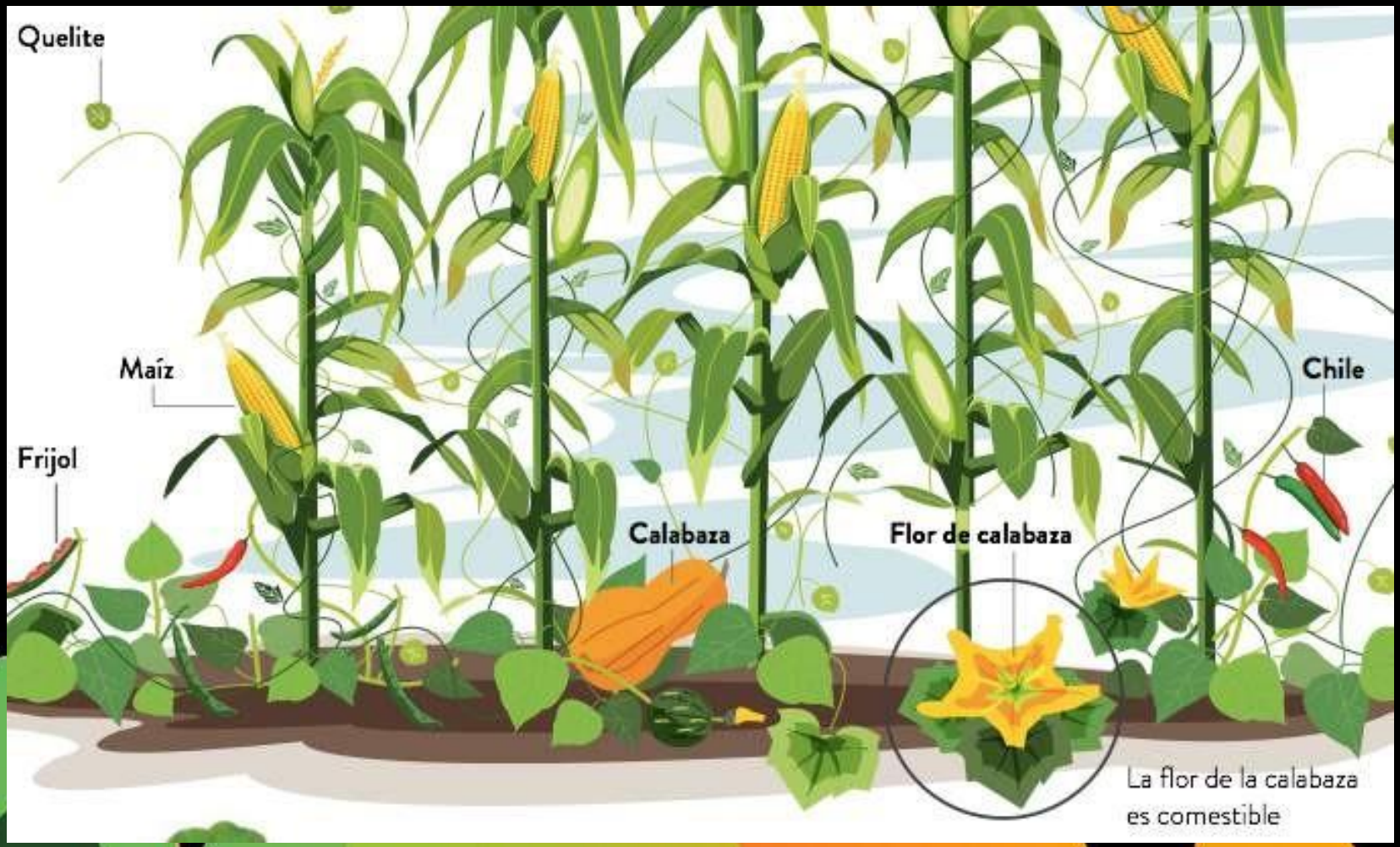


Foto FLAAR Mesoamerica

# A little history

Our early pre-classic ancestors already had a cultivation system based on corn, associated with species such as squash, chili and various kinds of beans, all important in feeding the populations that inhabited the area.



# A little history

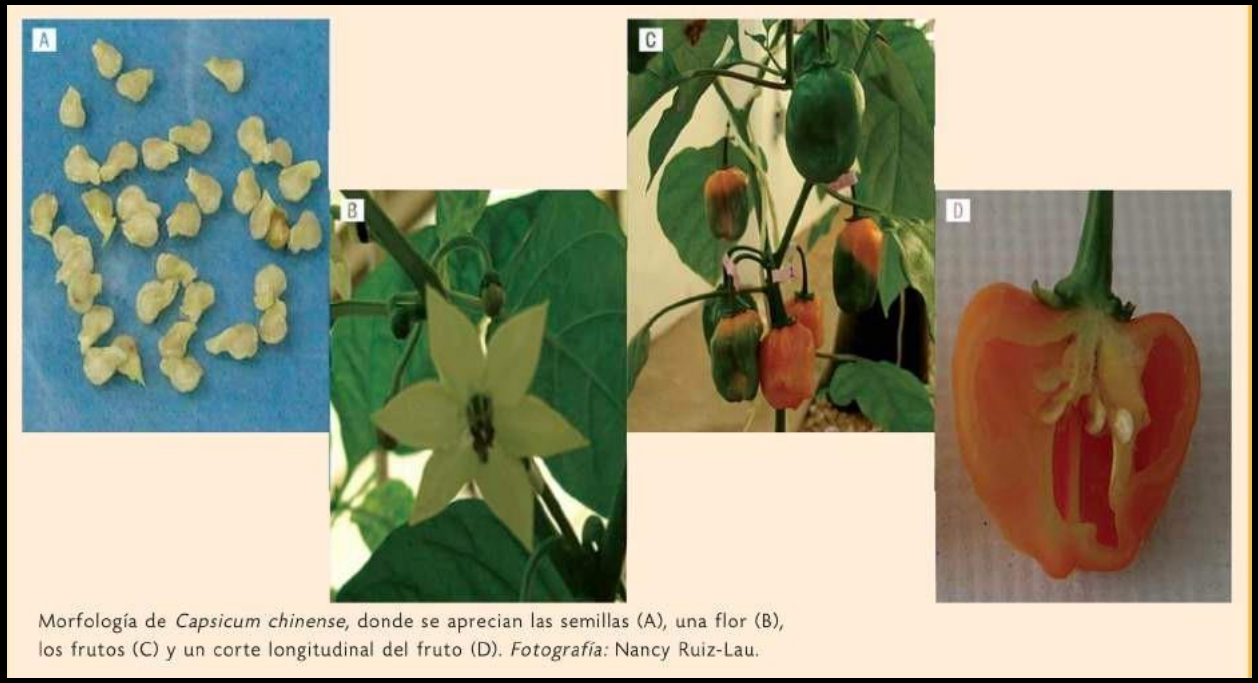
## Curious fact:

In pre-Hispanic times the inhabitants of the Mayan area already cultivated species typical of other centers of origin and cultures.

# Some examples:

**Habanero pepper*(Capsicum cinense)***

Origin: southern Brazil and eastern Bolivia.

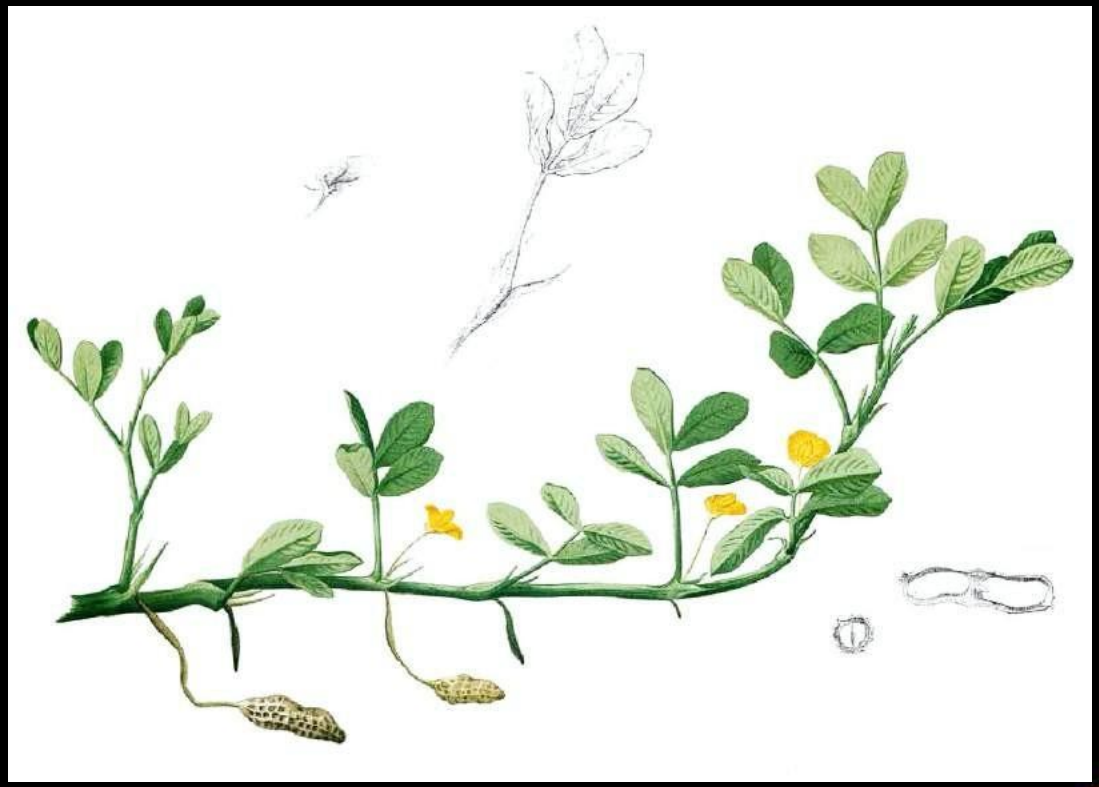



Morfología de *Capsicum chinense*, donde se aprecian las semillas (A), una flor (B), los frutos (C) y un corte longitudinal del fruto (D). *Fotografía:* Nancy Ruiz-Lau.

Hammons 2016

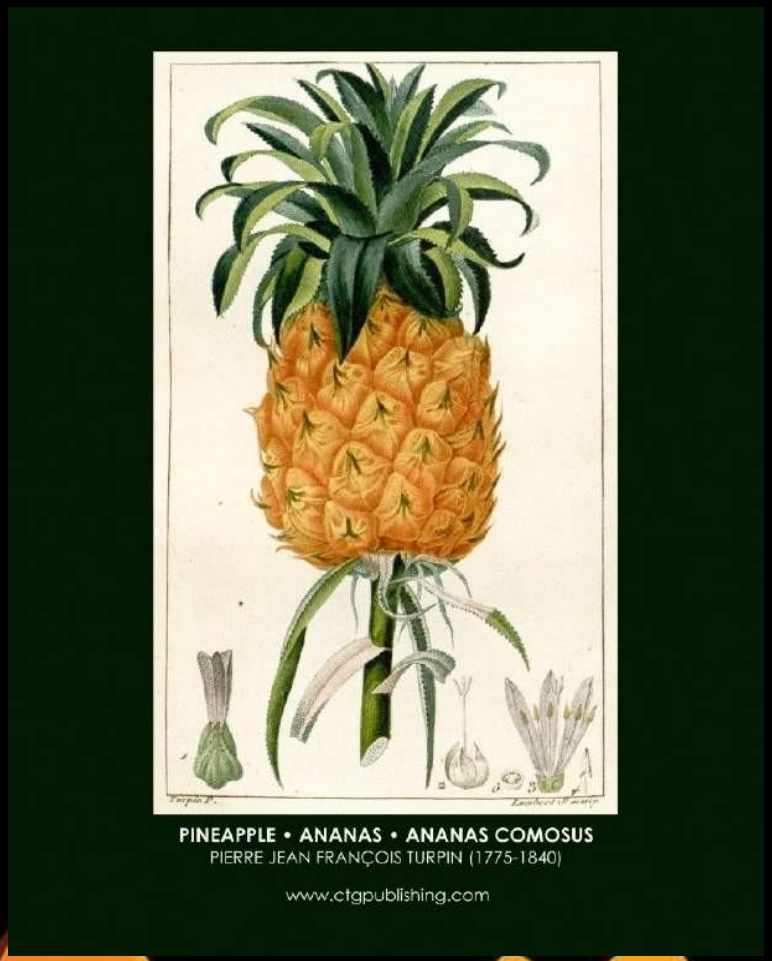
**Peanut (*Arachis hypogaea*),**

Origin: South America



Pineapple (*Ananas comosus*)

Origin: South America



Cashew (*Anacardium occidentale*)

Brazil, Venezuela

# A little history

**With paleontological, iconographic and linguistic evidence, the presence, management and use of native species have been reported, such as:**

**Cucurbitas**

Avocado (*Persea spp.)*

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Chilli *(Capsicum spp.)*

*Capsicum annuum*

Maguey (*Agave spp.*)

Pulque

Morro *(Crescentia alata)*

Chico *(Manilkara zapota)*

Zapote (*Pouteria sapota)*

Jocotes *(Spondias purpurea)*

Allspice (*Pimenta dioca*),

Ramón (*Brosimum alicastrum*),

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Sweet potato *(Ipomoea batatas*)

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Nance (*Byrsonima crassifolia)*

# A little history

Other genres that were important:

Bledo (Amaranthus retroflexus)

The Spanish prohibited the use of many traditional practices and crops of many plants, including pigweed.

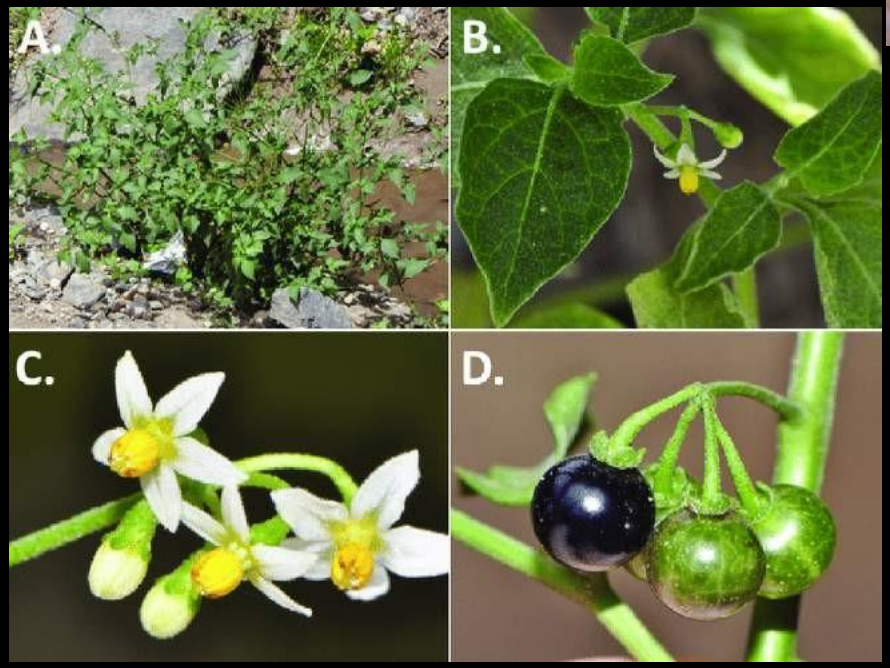
Hence the expression “Me importa un bledo“ (I don't give a damn) which generated fear and inferiority in the native populations towards the use of the plant, which caused it to fall into disuse.

Chaya (*Cnidoscolus* sp)

Espinaca Maya

*Apasote (Dysphania ambrosioides)*

*Güisquil or Chayote (Sechium edule)*




Macuy *(solanum sp)*

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*Samat (Eryngium foetidum)*

# High kitchen

The genera species mentioned are still widely used in rural communities in Guatemala

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# High kitchen

All these plants were the origin of all the traditional Guatemalan foods that were passed down from generation to generation.

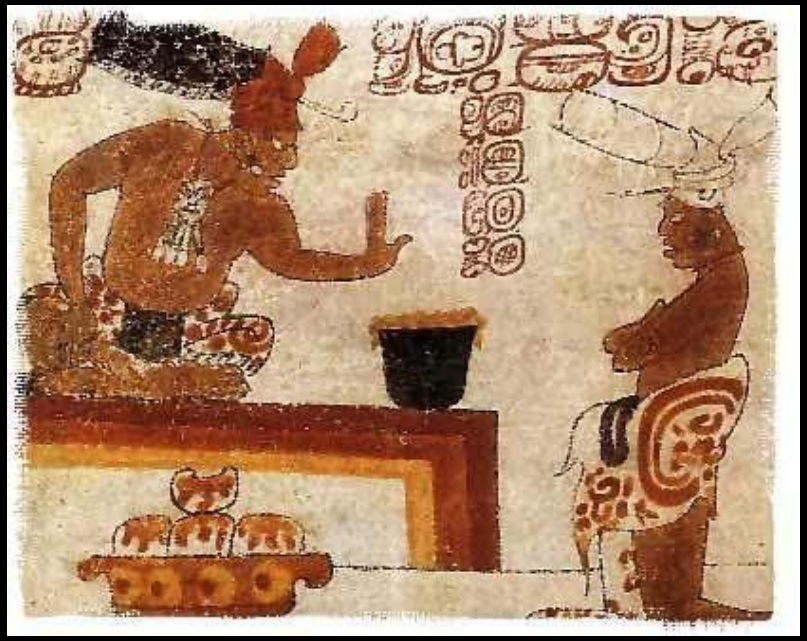
Many famous Guatemalan dishes
They are the product of the fusion of native plants and plants that came with the Spanish.

# Tamales

# Atoles

Drink of pre-Hispanic origin.
From Nahuatl “aguado” (watery)

# Chocolate

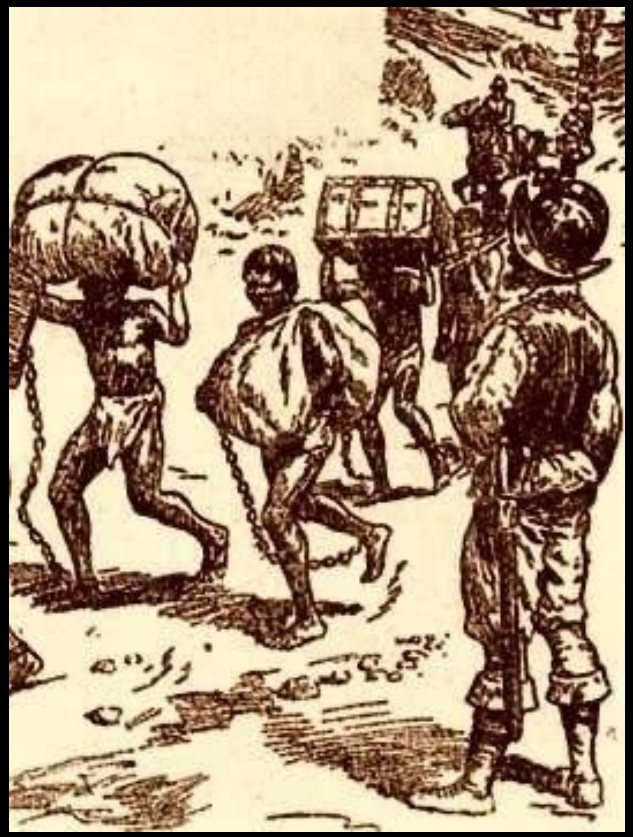


# Food security

The underutilized native species are characterized by having outstanding nutritional content, to such a degree that they considerably exceed
the nutritional content of the introduced cultivated species.


# Why are there so many malnutrition problems in Guatemala?

The current high levels of malnutrition are rooted in the colonial impositions of forced labor, tax policy to the crown, usurpation of land for monocultures, reduced access to protein, etc.



# Plants that came with the Spaniards

* Cabbage (*Brassica oleracea*) Native to Europe

* Lettuce (*Lactuca sativa*) Origin in India

* Parsley (*Petroselinum crispum*) Native to the Mediterranean region

# Plantas que vinieron con los españoles

* Spearmint (*Mentha spicata*) Native to Europe

* Borage (*Borago officinalis*) native to Lebanon, Syria and Egypt

* Oregano (*Origanum vulgare*) Native to Eurasia

* Onion (*Allium cepa*) Native to Asia

# Changes in eating patterns

The colonial institutions introduced changes that affected the traditional subsistence pattern and therefore the eating habits of the population.

By collecting taxes, they forced the native populations to plant exclusively corn and beans.

* Easy to weigh, transport, store, requires less care and time than other crops.

# Cambios en los patrones alimenticios

Después de la conquista las poblaciones nativas tenían una dieta muy restringida a solamente a maíz, chile, frijol y algunas frutas

# Changes in eating patterns

Gradually, diverse and productive traditional agriculture was abandoned due to extensive milpa cultivation systems.
and it was the beginning of dependence on monocultures.

# Changes in eating patterns

The diverse diet in vegetables was put aside, fruits, vegetables, seeds, roots, nuts, legumes, fungi, honey etc. access to protein sources from domesticated and wild animals was reduced.

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# Effects of dietary changes

## Malnutrition:

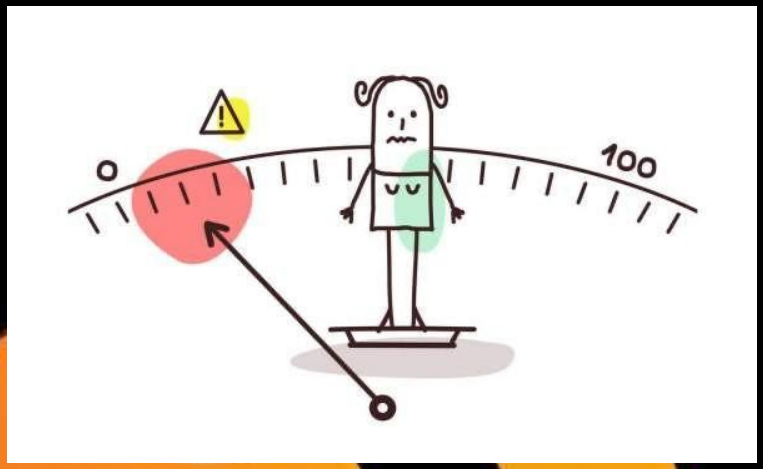
the diet got worse and worse in many regions of Mesoamerica, generating conditions of malnutrition.

# Effects of dietary changes

Low consumption and production of native plants there are ignorance of its uses, mismanagement and lack of changes in consumption patterns information.

# Use of native plants

The intensive use of these species can help combat malnutrition in Guatemalan populations



# Use of native plants

It is extremely important to return to ancestral crops that include diversity of native plants with high nutritional levels.

# Advantages of feeding with native plants:

1. They are high in energy, protein, vitamins, minerals, and fiber.

2. They do not have seasonal fluctuations.

3. They adapt to the area and are tolerant to droughts and pests typical of the region.

4. They expand the diversification of the current diet and improve its nutritional values.

5. They contribute to food security.

# Nutritional comparison of some native plants with some exotic ones

| | | Proteína | grasa | carbohidratos | fibra | ceniza | Calcio | fósforo | hierro | Actividad Vit. A | Vitamina B1 | Vitamina B2 | Niacina | Vitamina C | % Humedad | Energía, Kcal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GRAMOS | | | | | MILIGRAMOS | | | | | | | | | |
| NATIVAS | Chaya | 5.6 | 1.8 | 11.2 | 2.4 | 1.8 | 260 | 82 | 2.2 | 2.2 | 0.2 | 0.4 | 1.6 | 394 | 80 | 64 |
| | Bledo | 3.7 | 0.8 | 7.4 | 1.5 | 2.1 | 313 | 74 | 5.6 | 1.6 | 0.05 | 0.24 | 1.2 | 65 | 86 | 42 |
| | Chipilín | 7.0 | 0.8 | 9 | 2.0 | 1.5 | 287 | 72 | 4.7 | 3.0 | 0.33 | 0.49 | 2.0 | 100 | 82 | 56 |
| | H. Mora | 5.0 | 0.8 | 7 | 1.4 | 1.8 | 199 | 60 | 9.9 | 0.2 | 0.18 | 0.35 | 1.0 | 61 | 85 | 45 |
| | Calabaza | 4.2 | 0.4 | 3.4 | 1.5 | 1.6 | 127 | 96 | 5.8 | 0.8 | 0.14 | 0.17 | 1.8 | 58 | 90 | 26 |
| NO NATIVAS | Espinaca | 2.8 | 0.7 | 5 | 0.7 | 1.8 | 60 | 30 | 3.2 | 1.2 | 0.06 | 0.17 | 0.6 | 46 | 90 | 30 |
| | Acelga | 1.6 | 0.4 | 5.6 | 1.0 | 1.6 | 110 | 29 | 3.6 | 0.9 | 0.03 | 0.09 | 0.4 | 34 | 91 | 27 |
| | Lechuga | 1.0 | 0.1 | 3 | 0.5 | 0.4 | 16 | 23 | 0.4 | ... | 0.05 | 0.03 | 0.3 | 7 | 96 | 13 |

# Plants with high nutritional value:

**Amaranth or bledo (*Amatanthus sp*):** It is one of the best sources of vegetable protein that exists in nature

Seeds and leaves can be consumed.

# Hierba mora, quilete o macuy

In Guatemala there are three species

*Solanum americanum*
*Solanum nigricans*
*Solanum nigriscens*


| | Proteína | Grasa | Carbohidratos | Fibra | Ceniza | Calcio | Fósforo | Hierro | Actividad Vit. A | Vitamina B1 | Vitamina B2 | Niacina | Vitamina C | % Humedad | Energía, Kcal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GRAMOS | | | | | MILIGRAMOS | | | | | | | | | |
| Hierba Mora | 5.0 | 0.8 | 7 | 1.4 | 1.8 | 199 | 60 | 9.9 | 0.2 | 0.18 | 0.35 | 1.0 | 61 | 85 | 45 |

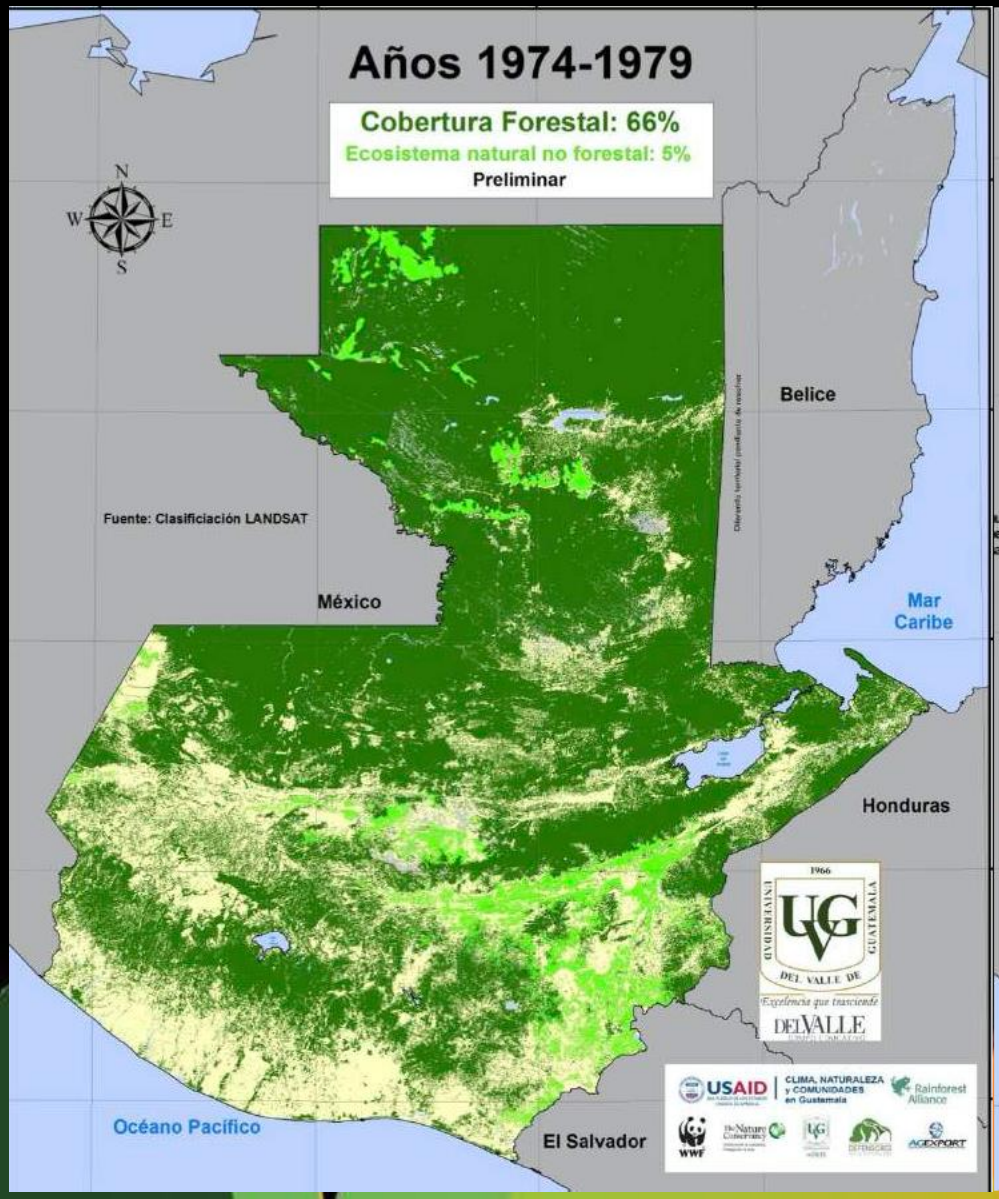
# Chipilín *(Crotalaria longirostrata)*

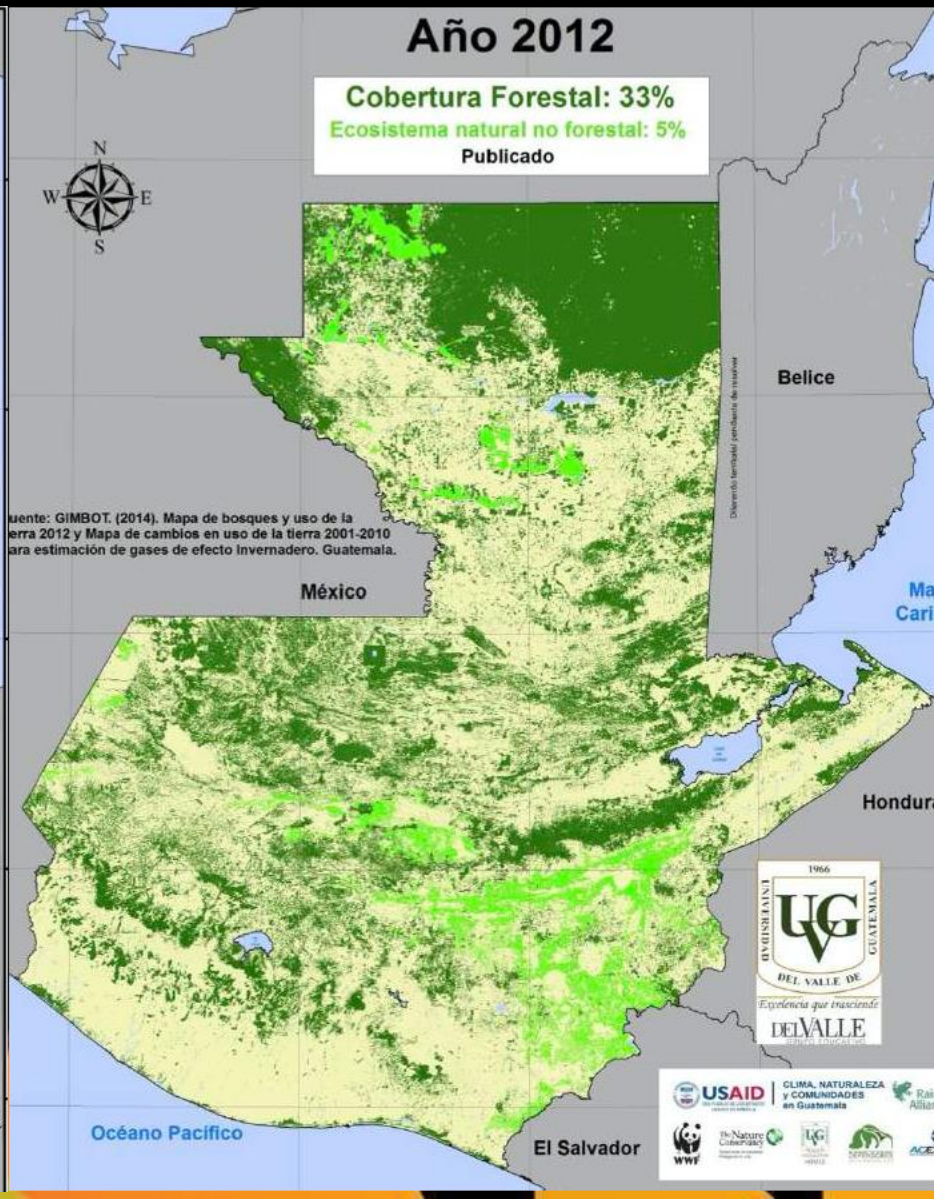
Chipilin has high content of calcium, iron, thiamine, vitamin B1, B2, B3 and Vitamin c.

| | Proteína | grasa | carbohidratos | fibra | ceniza | Calcio | fósforo | hierro | Actividad Vit. A | Vitamina B1 | Vitamina B2 | Niacina | Vitamina C | % Humedad | Energía, Kcal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GRAMOS | | | | | MILIGRAMOS | | | | | | | | | |
| Chipilín | 7.0 | 0.8 | 9 | 2.0 | 1.5 | 287 | 72 | 4.7 | 3.0 | 0.33 | 0.49 | 2.0 | 100 | 82 | 56 |

# Reforestation with native plants

Deforestation that is taking place at an accelerated pace.



# Reforestation with native plants

It is time to start valuing what is ours.
If we begin to reforest with native plants we will obtain benefits such as increased fertility of our soils, more moisture retention, more nourished soils.

# Examples of edible native plants for reforestation

Nance (*Byrsonima crassifolia*)

# Guava (*Psidium spp.*)

Ramon (*Brosimum alicastrum*)

Avocado (*persea sp*).

# Other alternatives

## Homegardens

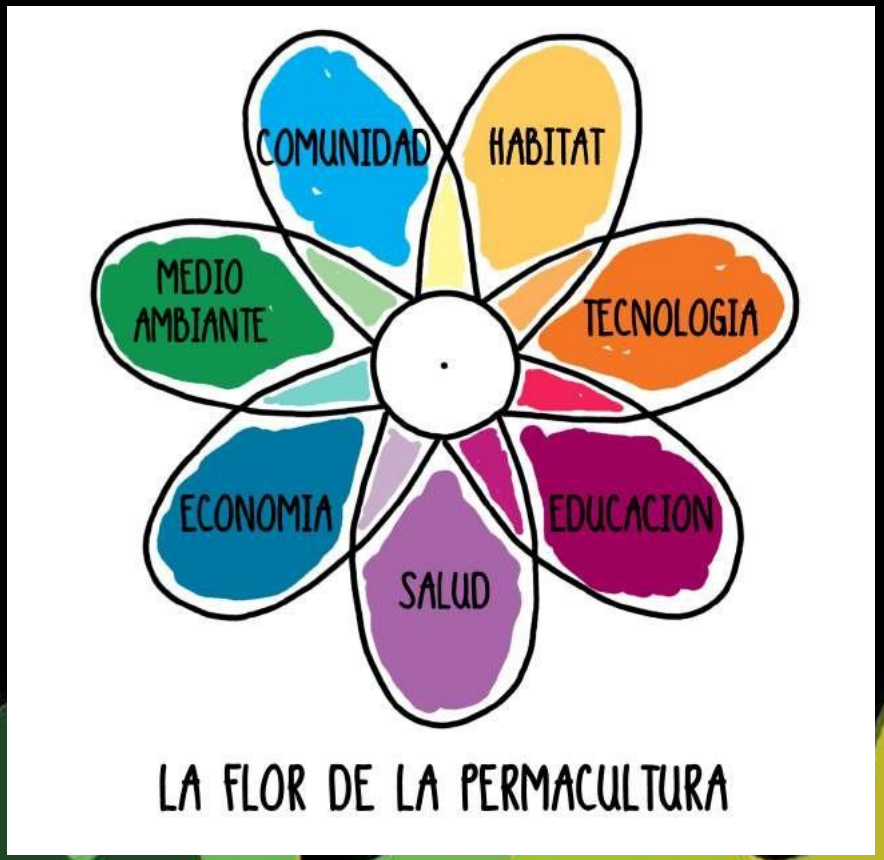
It is a plot where families grow vegetables, greens, fruits, medicinal plants, etc. continuously and intensively throughout the year.

- The whole family can participate
- It is a practice that satisfies basic family needs
- Reduce expenses
- You eat fresh and healthy

## Permaculture

It is a sustainable and productive cultivation design system
That seeks to satisfy the needs in the most friendly way with the environment, without polluting or exploiting resources.

The advantage is that it can be applied at home.




# Recommendations

1. Share the information with your acquaintances
2. Consume derivatives of native plants (Ramon, Amaranth etc).
3. Make your garden at home
4. Participate in reforestation days with native plants
5. Consume native plants
6. Buy local

# Thanks for your attention!!

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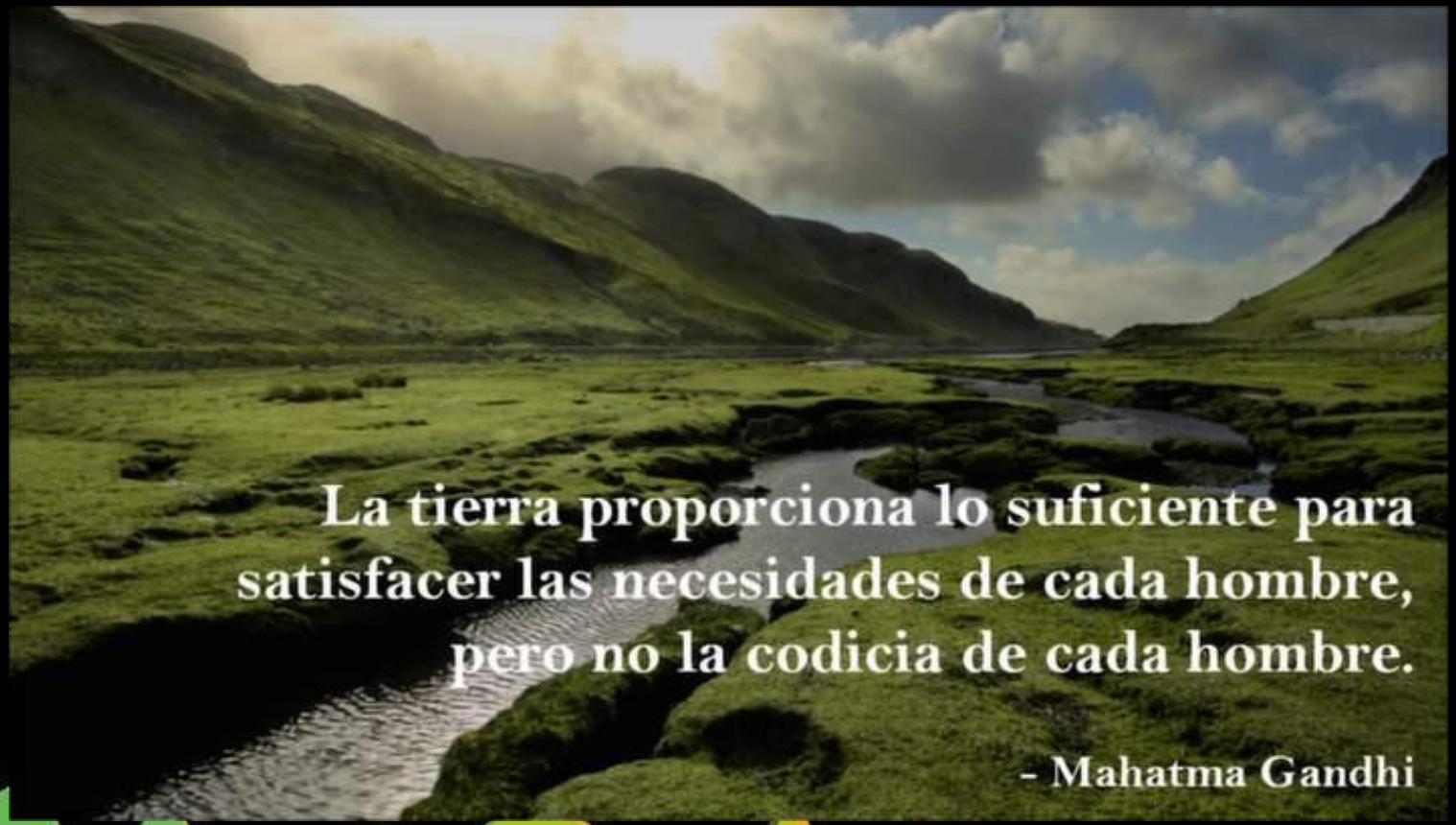

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