



# CENTER FOR CIRCULAR ECONOMY IN COFFEE

*A global **precompetitive** platform for enhancing Circular Economy in the coffee sector.*

*Launched during the **ICO World Coffee Conference** in September 2023.*

*Non-profit association established in Italy and supported by a **global network of partners**.*



## *Founding members and Strategic partners*



**Politecnico  
di Torino**



**Università di Scienze  
Gastronomiche di Pollenzo**  
University of Gastronomic Sciences of Pollenzo



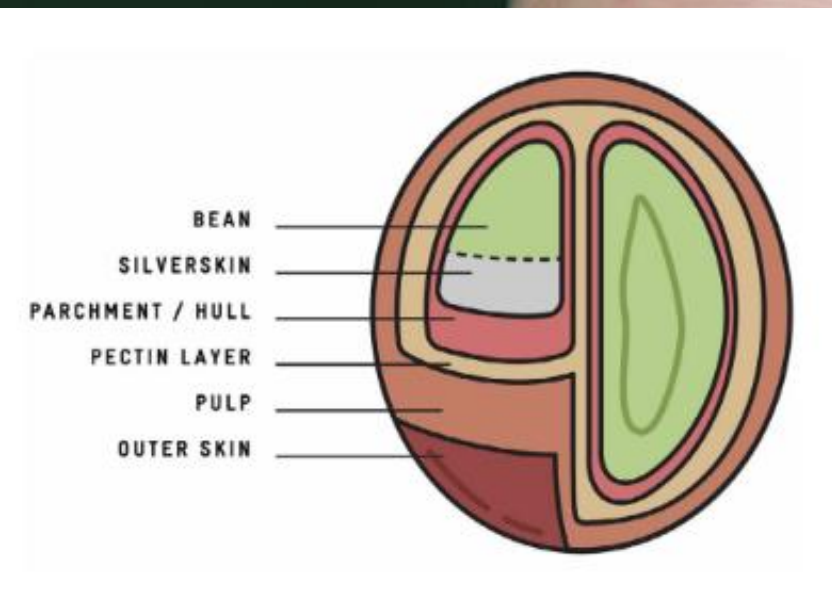
**INTERNATIONAL  
COFFEE  
ORGANIZATION**



**International  
Trade  
Centre**



**UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION**



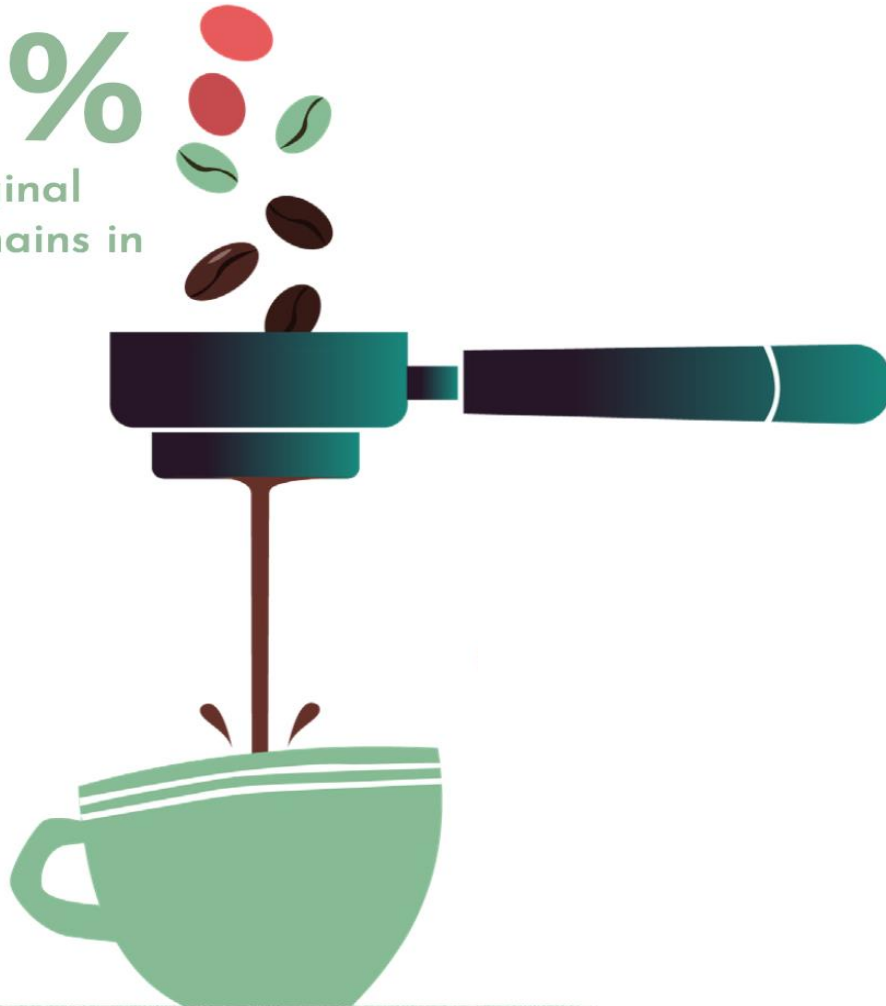




## Usable biological material generated through coffee production & processing

1-5%

of the original  
cherry remains in  
our cup



40.68

million tonnes of biomass  
generated globally.  
Equivalent to nearly seven  
times the weight of the  
Great Pyramid of Giza

72%

of total biomass is  
generated in coffee  
producing countries

29.34

million tonnes of total biomass generated  
from coffee processing from cherry to green  
coffee



11.14

million tonnes of spent coffee  
grounds  
generated



# Vision and Mission



From Linear



To Circular



## ≡ Vision

The Center for Circular Economy in Coffee (C4CEC) aims to be a **reference actor in the transition towards a circular model in the coffee sector**, where the concept of waste no longer exist and new models of profitability are created.

## ≡ Mission

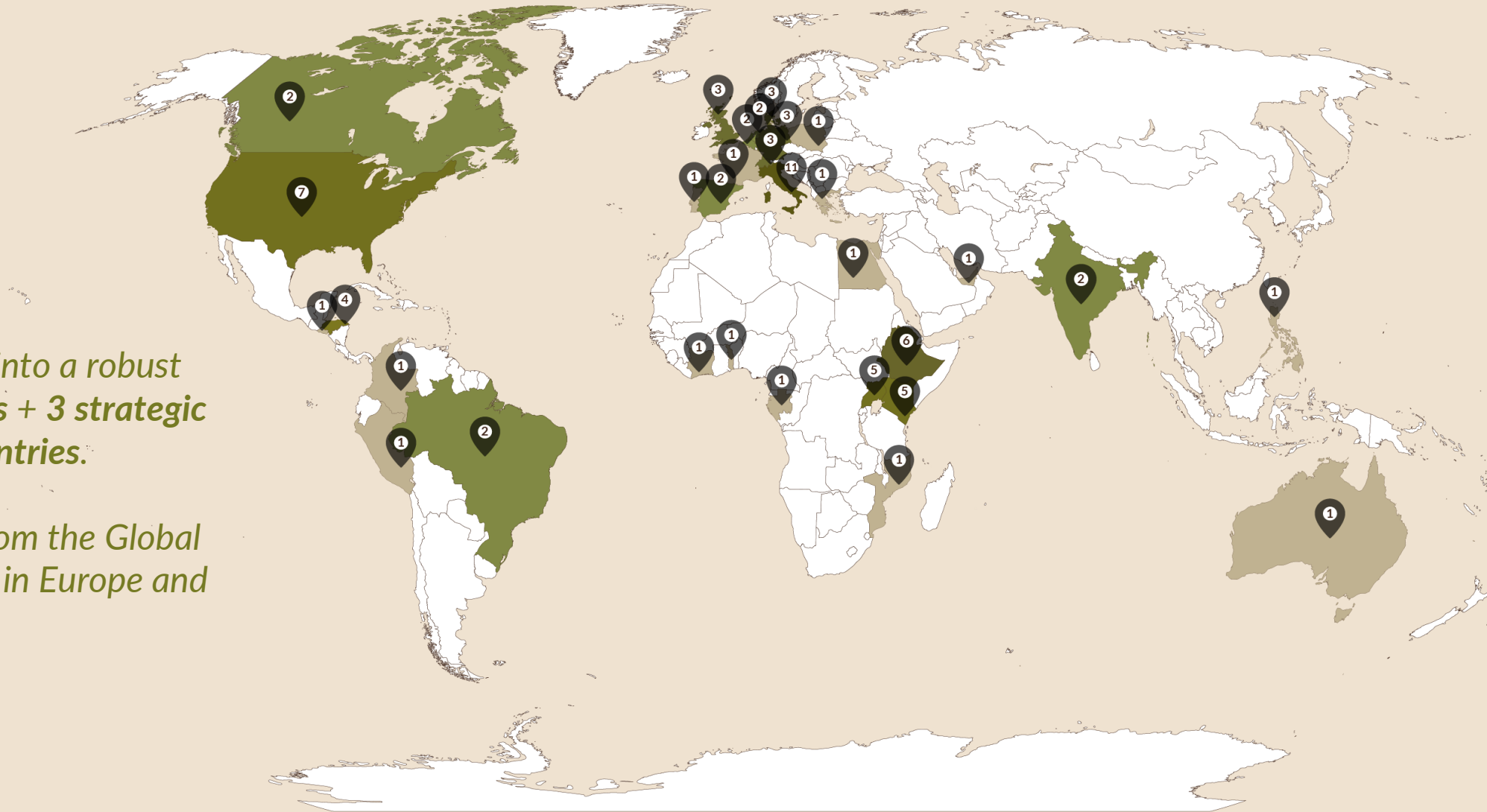
The mission of the Center is to provide a platform that **accelerates the transition to a circular economy** in the coffee sector by fostering collaboration, sharing knowledge, and advocating for circular initiatives. The Center brings together local producer communities, roasters, associations, institutions, research centers, and academia **to drive collective action**.

## C4CEC membership at a glance

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*The C4CEC has grown into a robust network of 77 members + 3 strategic partners across 31 countries.*

*44% of members are from the Global South, with 41% based in Europe and 12% in North America.*



## FOUNDERS



ALLIANCES  
FOR ACTION



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

## MEMBERS



**Solidaridad**



**Huskee.**



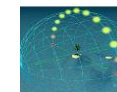
COFFEE KREIS



MR. BEAN COFFEE LTD.  
ROMANCING THE BEAN!



grounds for good

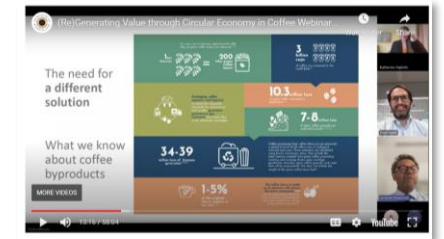




## AWARENESS & CULTURE FOR CIRCULARITY

*Serve as the global hub for knowledge exchange and awareness for circular economy in the coffee sector*

- Curate and disseminate evidence-based good practices validated by the Scientific Board.
- Build and foster a multi-stakeholder global network for dialogue and collaboration.
- Share insights through publications, webinars, and events to foster a culture of circularity across the coffee sector.
- Connect coffee value chain actors with circular economy innovators to spark partnerships and scale solutions.
- Promote advocacy and thought leadership to influence sector-wide adoption.





## AWARANESS & CULTURE FOR CIRCULARITY

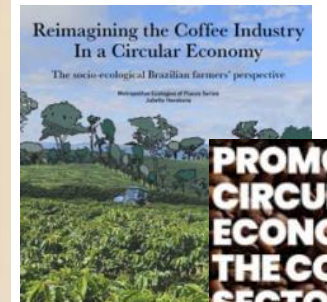
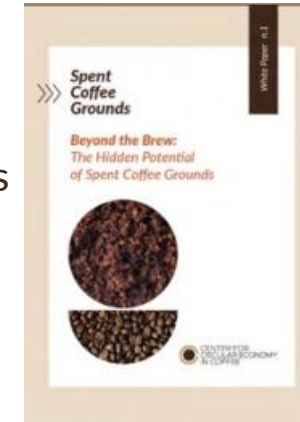
*Serve as the global hub for knowledge exchange and awareness for circular economy in the coffee sector*



## RESEARCH & CAPACITY BUILDING FOR SYSTEMIC CHANGE

*Generate actionable evidence and strengthen capabilities to enable circular practices for circular economy in the coffee sector*

- Consolidate emerging research and translate it into practical innovations.
- Produce technical guides, policy briefs, and white papers.
- Develop research-backed training materials and courses.
- Partner with associations and members to build capacity, especially for SMEs and producer organizations in coffee-growing countries.
- Facilitate knowledge transfer between research institutions and industry actors



# Strategic Pillars

## AWARANESS & CULTURE FOR CIRCULARITY

*Serve as the global hub for knowledge exchange and awareness for circular economy in the coffee sector*



## RESEARCH & CAPACITY BUILDING FOR SYSTEMIC CHANGE

*Generate actionable evidence and strengthen capabilities to enable circular practices for circular economy in the coffee sector*

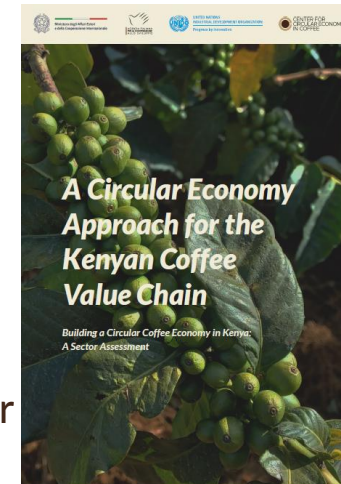


## TURN KNOWLEDGE INTO ACTION FOR SCALABLE CIRCULAR IMPACT

*Drive real-world implementation of circular solutions through pilots, innovation testing, and collaborative projects*



- Implement donor-funded and public-private partnership projects.
- Establish demonstration plots and proof-of-concept pilots for scalable circular economy solutions.
- Deliver trainings and Train-the-Trainer (ToT) programs.
- Test and validate circular innovations for scalability and market integration.
- Support members with technical assistance, market linkages, and financing opportunities to strengthen adoption of circular practices.
- Document and share learnings from pilots to inform sector-wide replication.

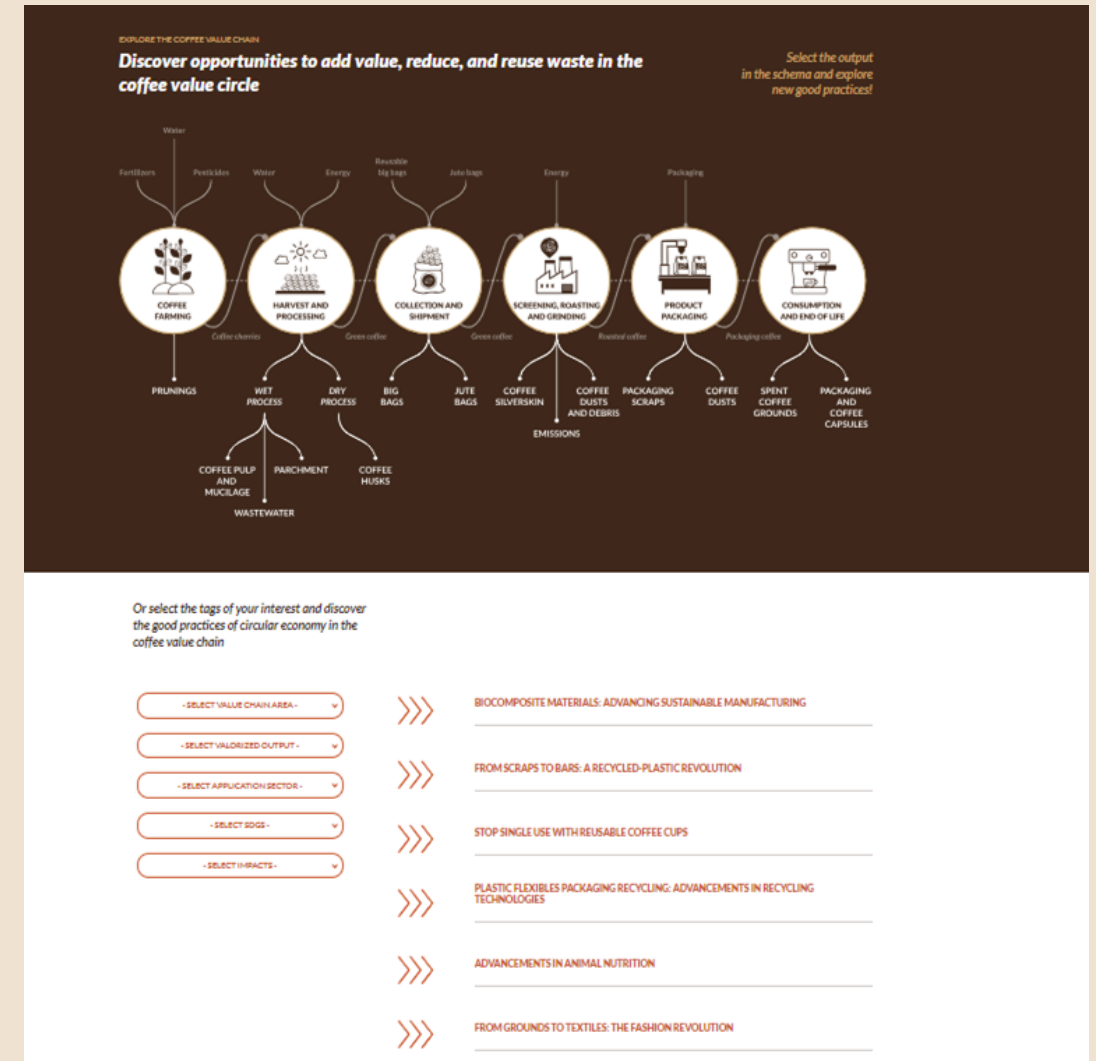


*An ever-evolving resource designed to highlight and promote sustainable and circular approaches, in the coffee sector.*

*The initiatives displayed on our website are evidence-based & approved by the Scientific Board and contain technical guides, case studies and best practices.*

## COLLECT AND SHARE GOOD PRACTICES

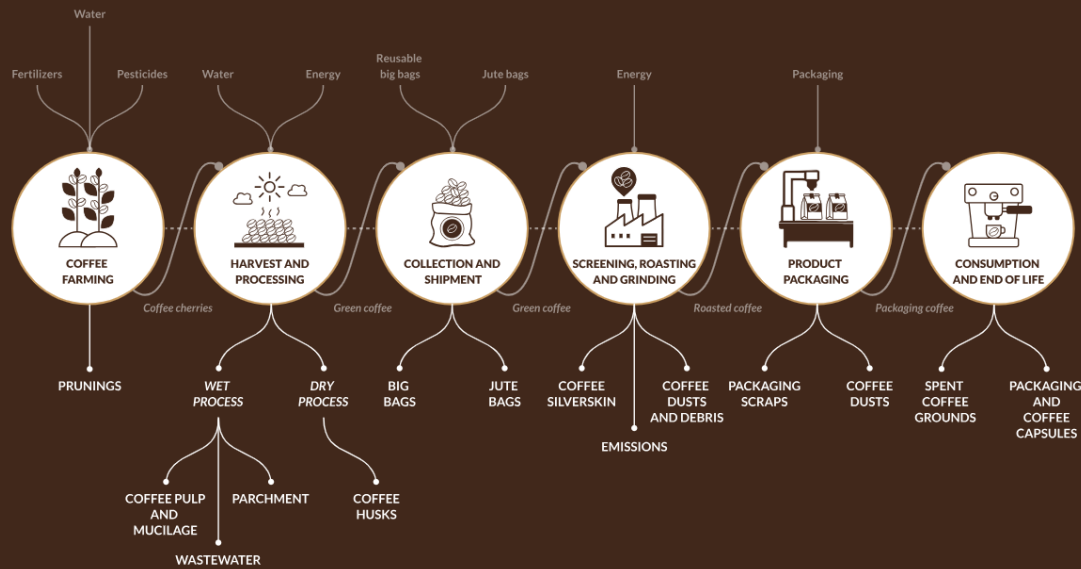
### Good Practices Mapping



## EXPLORE THE COFFEE VALUE CHAIN

**Discover opportunities to add value, reduce, and reuse waste in the coffee value circle**

*Select the output in the schema and explore new good practices!*



*Updated good practices and Initiatives can be found here!*



### Coffeefrom

Italy, 2021

( [Find Out more](#) )



An Italian company producing biodegradable materials from industrial coffee grounds, used in tableware, packaging, and writing instruments.



### Kaffeeform

Germany, 2009

( [Find Out more](#) )



A Berlin-based company specializing in injection molding to create everyday products like coffee cups and accessories from spent coffee grounds.



### CreativeARQ

Portugal, 2016

( [Find Out more](#) )



A company specialized on architectural and interior design solutions. It has expanded into three distinct branches and brands: Ceramista, For Arte, and Pladec. Pladec focuses on designing with wood and mixed materials, including spent coffee grounds.



### Steward Design Panels

Netherlands, 2019

( [Find Out more](#) )



A Netherlands-based group producing panels from 95% coffee grounds for interior design applications.



### Re-worked

UK, 2015

( [Find Out more](#) )



A nonprofit merging industrial design and green technologies to create furniture from spent coffee grounds and recycled plastics. Their signature material, Surface, combines coffee waste with surface functionality.



### Zuiver

Netherlands, 2021

( [Find Out more](#) )



A Dutch furniture company integrating spent coffee grounds into the composition of their products, such as the Albert Kuip coffee chair.

## Example of good practices

### Exploring biochar for sustainable soil solutions



## DO IT YOURSELF

### Learning Video: How to Make Biochar Fertilizer



Learning Video: How to Make Biochar Fertilizer

Copy link

**Learning Video**

How to Make Biochar Fertilizer

Watch on  YouTube


Learning Video:

Making Biochar Fertilizer





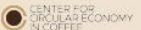
List of Materials

- Coffee husks or maize husks, bean husks - 1 bag
- Gardening bags - 5
- Chicken droppings or cow dung, pig droppings - 1 bag
- Banana peelings or Irish potato peelings - 1 bag
- Metallic drum - 1
- Fine mesh strainer (for sieving) - 1
- Stick (steering the organic waste) - 1
- Jerry can/water (to put fire out) - 1



Note: This can make up to 50 kg of biochar fertilizer

 **Biochar fertilizer**

 **LEARNING POSTER** 

**7 Steps** TO MAKE BIOCHAR FERTILIZER


**MATERIALS**

This can make up to 50 kg of biochar fertilizer


Coffee husks or maize husks, bean husks	1 bag
Gardening bags	5
Chicken droppings or cow dung, pig droppings	1 bag
Banana peelings or Irish potato peelings	1 bag
Metallic drum	1
Fine mesh strainer (for sieving)	1
Stick (steering the organic waste)	1
Jerry can/water (to put fire out)	1
Maize cobs	1
Tree branches	1

**Benefits**

- Increases soil fertility thus better yield
- Helps conserve the environment




1 Dry the organic waste. These include coffee husks, animal droppings, banana peelings and others.




2 Start burning the dry organic waste (start with dry grass) in a metallic drum. Light with hot charcoal or a match. Add any other organic waste that can quickly light then add chicken or cow droppings.




3 Continue burning the organic waste to make a charcoal-like carbon-based material. Keep mixing all the waste to ensure that it all burns.



4 Remove the carbon-like material and sieve it using a mesh strainer. Fine particles can be separated from the residues.





5 Pack the biochar fertilizer into gardening bags.



6 This is now ready to be taken into the garden to increase soil fertility.

**TIPS**

- Do not use wet organic waste since it will not burn.
- While burning, ensure that a flame is not created as it will cause the waste to burn into ash.
- Cool carbon-like material by sprinkling little amounts of water.

**CREDITS TO:**  



***For every 1kg of spent coffee grounds used as a medium for growing oyster mushrooms, 4.6kg CO<sub>2</sub> emissions are avoided*** (Ellen McArther Foundation)



*A low-cost sustainable pest control system utilizing spent coffee grounds to target pests such as slugs, ants, and aphids.*

*Coffee-based organic pesticide formulations as an alternative to copper-based chemicals, significantly reducing input costs.*

*This approach also minimizes heavy*



**Problem:** 86% of the coffee cherry is discarded as agricultural waste or by-products.

Coffee husks, consisting of the dried skin, pulp, and parchment layers, make up about 45% of the coffee cherry.



**Solution:** produces Cascara from coffee husk and pulp sourced directly from farmers.



**Market Potential:** The global cascara products market is expected to grow at a CAGR of 10.4% through 2032.

Asia and other emerging markets are the key markets, with demand projected to rise significantly in these regions.



## C4CEC MEMBER INITIATIVE





**Problem:** 86% of the coffee cherry is discarded as agricultural waste or by-products.

More than that in producing countries, there is also a huge amount of woody biomass from tree rejuvenation left to decompose or used as firewood to produce energy releasing  $\text{CO}_2$ .

Artisanal biochar is affordable but comes at the cost of pollution, inefficiency, and poor scalability.

High tech- bioreactors Initial investment costs are high.



**Solution:** Reduce emissions through Biochar  
Carbon sequestration (by up to 50%)

- > Mobile and decentralized bio machines
- > Increase crop yield when combined with fertilizer
- > Improve water retention in soil
- > Increase net farm income (Carbon Credits +





**Problem:** In the past year alone, **11 million tons** of spent coffee grounds were generated worldwide.

In the 2022/23 coffee year, approximately **14.68 million** tons of coffee husks were generated from naturally processed coffee.



### Solution: Circular Economy Initiatives

- > Reusable coffee cups, pens and other plastic based materials from biopolymers extracted from Spent coffee grounds.
- > Reusable, recyclable cup made from coffee husk.
- > Extracting bioactive compounds to produce coffee oil, lignin and other chemicals which can be used as inputs for various industries –

## C4CEC MEMBER INITIATIVES

COFFEE KREIS



Huskee.



KAFFE BUENO



# Thank you





> **TRAINING SESSION:**

Politecnico di Torino  
Università di Scienze Gastronomiche  
Focus Group in Kenya

> **DESIGN WORKSHOP:**

RAFFLES Milano

## Design Workshop with Youth



Photo credits: Politecnico di Torino



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