

Affective soil: Using agroecology to improve our relationship with soil

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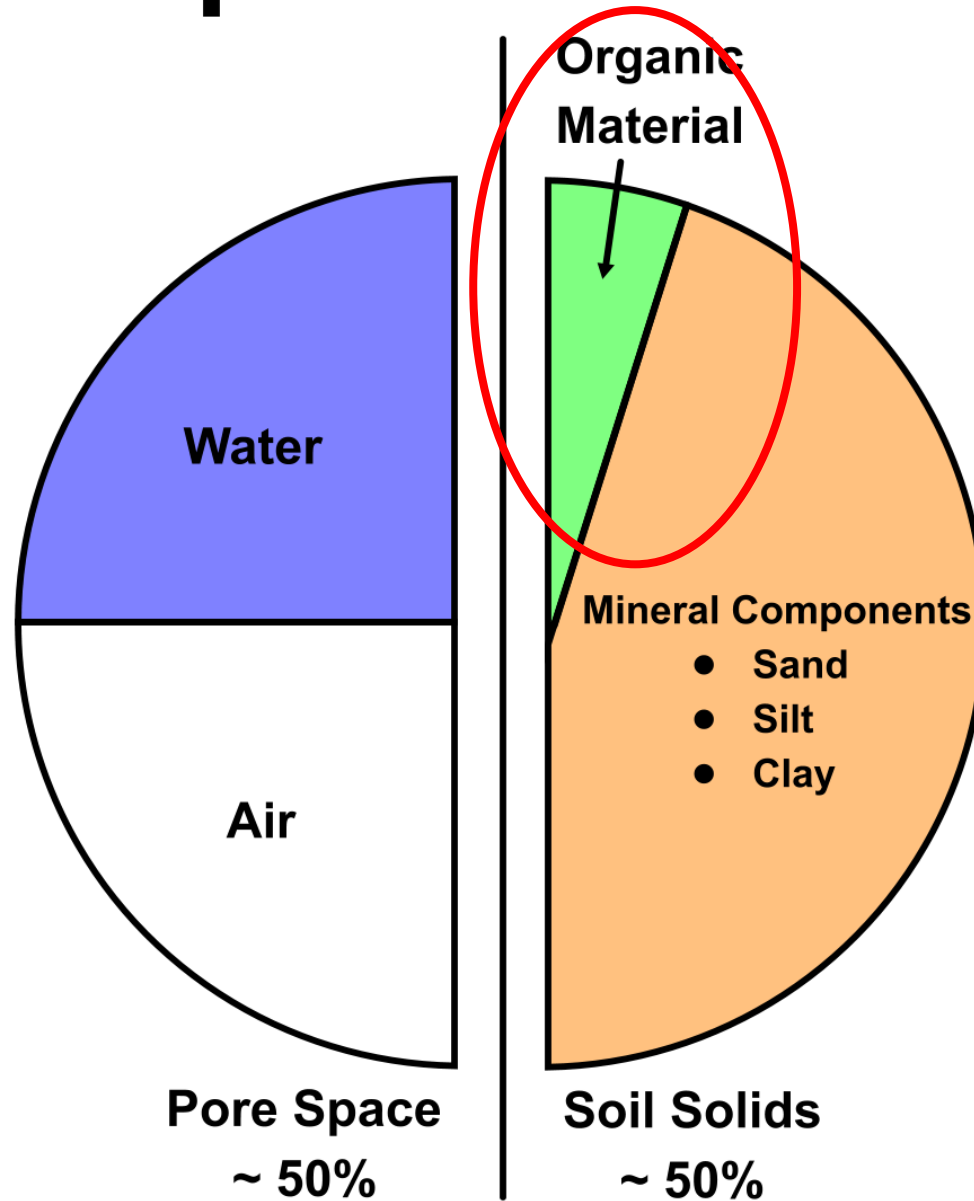
Rancho
of
San Diego

Trust Company

What happens
when we improve
soil health?



Components of Soil





Carbon Sink & Solidarity Farms

Est. 2018 with goals in mind:

- reduce or eliminate **tillage** on at least 80% of the farm
- transition 70% of production to **perennial** crops
- plant **cover crops** in orchards and vineyards to reduce soil temperatures
- improve **water holding capacity** and decrease the application of water
- encircle farm with **hedgerows** and **windbreaks** to improve pollinator habitat,
- increase the availability of **traditional food**, fiber, and medicine, and reduce wind erosion/evaporation
- Use **compost** to increase soil organic matter.





Carbon Sink & Solidarity Farms



- **No-till or reduce tillage crop field** and the **addition of quality compost application** has helped to achieve 4.4% of Soil Organic Matter,
 - Increased from 1% to 4% since 2018.
 - Every 1% increase in SOM increases the water holding capacity by 3.7% (Hudson 1994)
 - In 2020, this equated to a drawdown of nearly 600 metric tons of CO₂, offsetting the emissions of 80 American households.
 - increase the **water-holding capacity in the soil**



On the 5-acre of food production converted to **no-till** methods

- increase in plant yield
- vegetables are more resilient to extreme weather conditions
- a significant reduction in reports of pest presence.





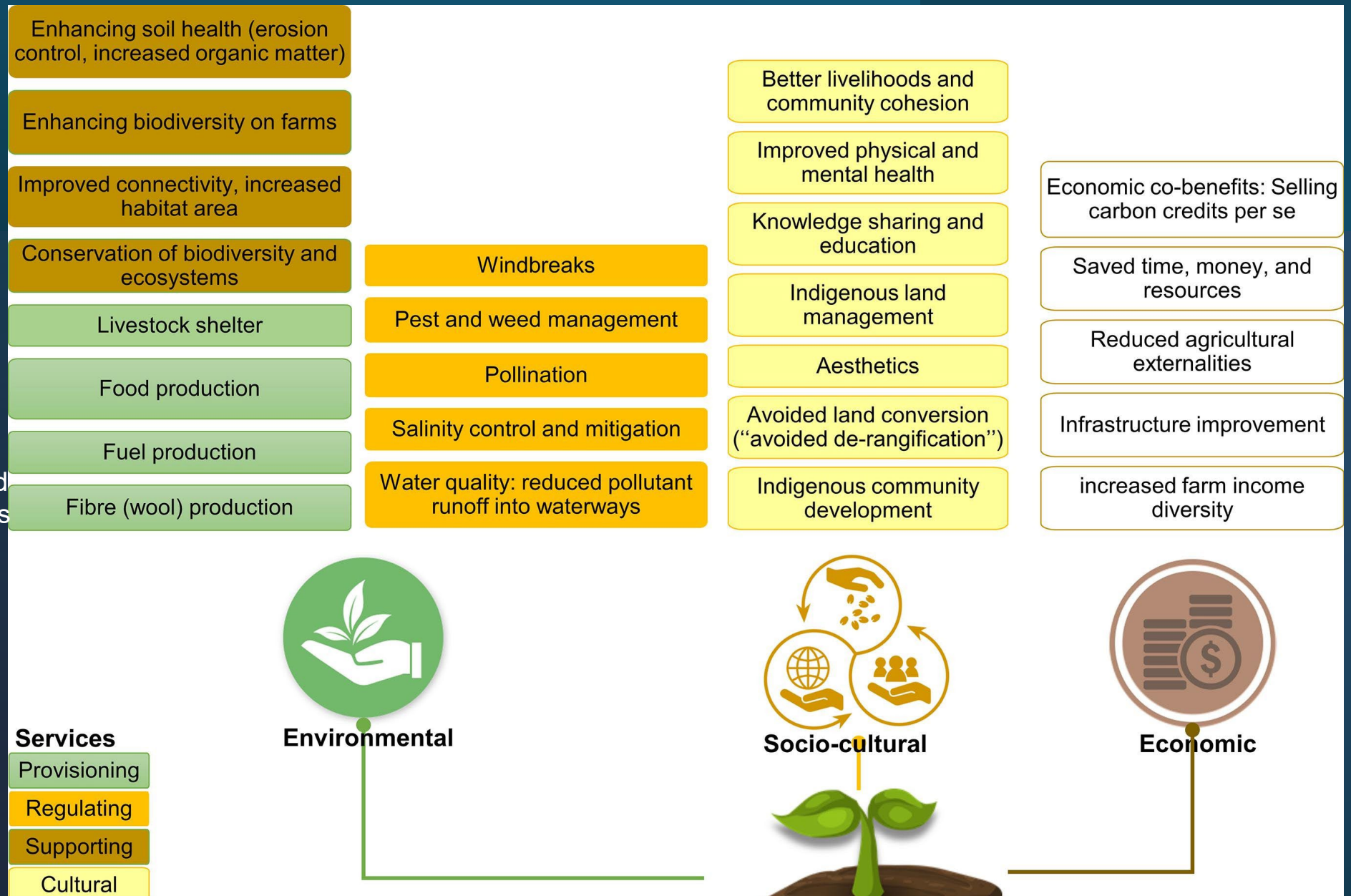
- **Hedgerows** and **windbreaks** fulfill a multitude of purposes
- They attract pollinators
- slow erosion from wind
- improve microclimates and biodiversity on portions of the farm that are prone to extreme heat and frost
- help to increase biodiversity in our farm systems,



All of these components were designed through a **Traditional Ecological Knowledge** framework

- plant selection follows the traditions of local indigenous communities where the needs for food, medicine and fiber was provided mostly from the local ecosystem.

Baumber, A., Metternicht, G., Cross, R., Ruoso, L.E., Cowie, A.L. and Waters, C., 2019. Promoting co-benefits of carbon farming in Oceania: Applying and adapting approaches and metrics from existing market-based schemes. *Ecosystem Services*, 39, p.100982.



Underserved Farmers for Underserved Communities



San Diego Foodshed est. 2020

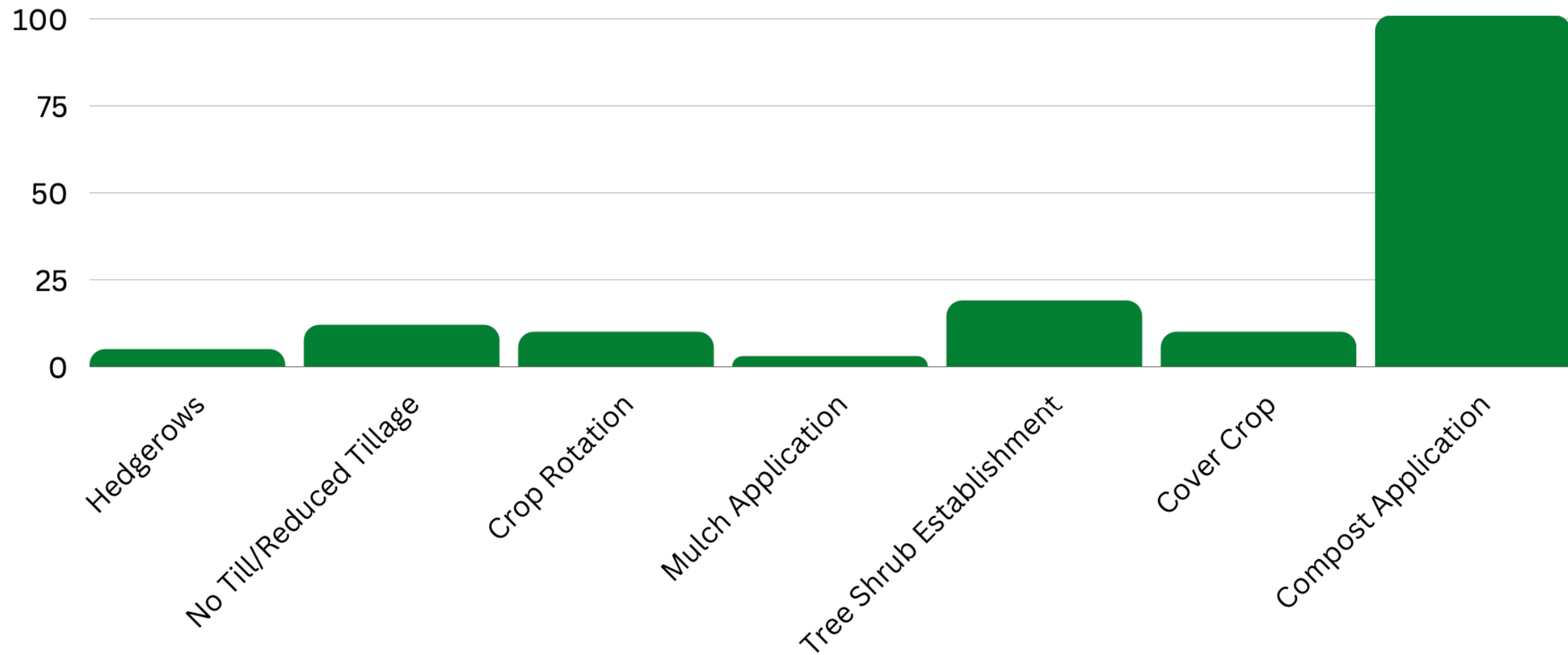
- 67% BIPOC owned, 50% women owned farms
- 14 SD country Farms
- “Foodshed is equally committed to change the inequitable distribution of healthful foods and the historical disinvestment in black, indigenous, and immigrant communities that will be exacerbated by a changing climate (CSIP Program Report 2022).”

	Participation Level	Incentive
Tier 1	Attend at least 6 climate-smart production trainings each year & complete a soil health assessment.	Earn 5% on verified products moved through Foodshed
Tier 2	Complete Tier 1, work to improve soil health through increased compost application and reduced tillage	Earn 10% on verified products moved through Foodshed; FREE compost is available to Tier 2.
Tier 3	Complete Tier 1 & 2; implement Carbon Farm Plan with multiple NRCS carbon farming practices	Earn 15% on products moved through Foodshed. FREE compost is available to Tier 3.

Table 1: Carbon Sink Incentive Program – Tiers

Local sequestration

Locally a total of **160 Metric Tones of CO₂** was sequestered from 7 conservation practices in 2023



SD County Farms

- Country wide agriculture sequestration: 24,000 MT on 136,985 acers.
- Foodshed sequestration: 160 MT on 156 acers
- Foodshed sequestration 1.02 MT per acer
- County wide sequestration 0.175 MT per acer
- Carbon Farming Potential 136,985 MT

Healing Relationships - Principles of the SD Foodshed

EQUITABLE DISTRIBUTION

- Foodshed sustains communities by meeting people where they are at and works tirelessly to build and sustain healthy families

THRIVING FARMS

- Foodshed works directly with farmers to build thriving farms that produce quality food that is good for the people and the environment and develops mutual aid support networks to empower local BIPOC farmers.

MOBILIZE COMMUNITIES

- Foodshed invests in a healthy, food secure future for all San Diegans.



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Thank you!

References

- Baumber, A., Metternicht, G., Cross, R., Ruoso, L.E., Cowie, A.L. and Waters, C. Promoting co-benefits of carbon farming in Oceania: Applying and adapting approaches and metrics from existing market-based schemes. *Ecosystem Services*, 39, p.100982. 2019
- Foodshed Cooperative. Carbon Sink Incentive Program. Program Report. 2022
- McCord, Gordon C., Elise Hanson, Murtaza H. Baxamusa, Emily Leslie, Joseph Bettles, Ryan A. Jones, Katy Cole, Chelsea Richer, Eleanor Hunts, Philip Eash-Gates, Jason Frost, Shelley Kwok, Jackie Litynski, Kenji Takahashi, Asa Hopkins, Robert Pollin, Jeannette Wicks-Lim, Shouvik Chakraborty, Gregor Semieniuk, David G. Victor, Emily Carlton, Scott Anders, Nilmini Silva Send, Joe Kaatz, Yichao Gu, Marc Steele, Elena Crete, and Julie Topf. San Diego Regional Decarbonization Framework: Technical Report. County of San Diego, California. 2022.
- Montgomery, David R. *Growing a Revolution: Bringing our Soil Back to Life*. WW Norton & Company, 2017.