

The COSA indicators are similar across all countries to allow for comparison, but are also adapted to allow for local contexts. Consistent indicators allow a shared understanding and a foundation for better management of sustainability.

*Indicator definition: For COSA an indicator is contextual information about a farming system. Indicators relate to characteristics that can be expected to change over time as the sustainability of a farming system increases.*

COSA indicators are derived from a series of observed facts and reported perceptions. The indicators provide both easily interpreted performance metrics and a rich multi-dimensional understanding. They help to develop and monitor practical objectives and the questions related to them are widely field-tested to permit confident observations and interpretation. What an indicator captures is important but even more valuable is the combined COSA experience to gather, analyze, and communicate results in a balanced and effective manner.



## Key Characteristics

There are a number of vital characteristics, ranging from household characteristics and land tenure to distance to market and shocks, that are critical to understand as part of any sustainability assessment.

GLOBAL THEME	CORE ELEMENTS	INDICATOR	DESCRIPTION
Key Characteristics	Household Demographics	Producer characteristics	Age of decision maker (producer) responsible for the focus crop, grades of school completed, gender, years of experience growing focus crop
		Household revenue	Combined revenue from focus crop sales, other crops, other earnings (off farm employment, services, business revenue, land or equipment rental), and gifts & remittances
		Household composition	Number of people, genders, ages, dependency ratio, literacy, and school grades completed
	Farm Characteristics	Farm characteristics	Management by owner, renter, or sharecropper or by a paid manager; farm size; age of focus crop trees (if relevant); focus crop area; farm location (GIS coordinates); distance from farm to nearest commercial center and to medical services
		Land tenure	Owned by farmer, rented, sharecrop, communal ownership, farmed without payment
	Adverse Events	Shocks	Occurrence of major events that led to a serious reduction in the household's income, assets, or consumption in last production year (severe weather, crop or livestock losses, sharp decline in prices, policy changes, death or serious illness or injury of family member, crime, civil conflict, etc.)



SOCIAL

COSA's social indicators are aligned with major international agreements and cover a range of issues including working conditions, household conditions, food security, education, basic rights, participation in community, trading relationships, and the perception of wellbeing.

GLOBAL THEME	CORE ELEMENTS	INDICATOR	DESCRIPTION
Living and Working Conditions	Health and Safety	Restrictions on agrochemical application	Categories of people restricted from applying chemical pesticides: untrained people, pregnant women, children through age 18, elders
		Protective gear for agrochemical application	Farm supplies protective gear (hats, masks, protective clothing, etc.) to workers who apply agrochemicals
		Farm injuries	Number of injuries on farm that required medical treatment
	Living Conditions	Access to medical services	Travel time from farm to medical services, perceived affordability of medical services
		Smoke ventilation in cooking area	Whether or not a vent or chimney is used to eliminate indoor smoke
		Poverty status	Comparison of household revenue to national (or regional if available) poverty line Progress out of Poverty Index score (PPI) - evaluation of poverty propensity
Basic Human Rights and Equity	Labor Rights	Child labor	Time spent by children working on focus crop production
		Minimum wage - laborer	Daily earnings for farm labor compared to (rural) minimum wage
		Safe water for laborers	Laborers' access to water they consider safe to drink during work
	Education	Training	Data include: Training topics and hours attended, fees, time and cost for travel, provider of training
		Children in school at appropriate grade level	Number of household members through age 18 who have completed appropriate number of grades for age
	Food Security	Days without sufficient food	Consistent daily physical and economic access to sufficient, nutritious, satisfying food for all household members; Number of days in past year that any member of household cut food consumption due to lack of food; months of comparatively less food security
	Gender	Women's participation in producer organization	Intensity of women's participation in producer organization indicated by number of ways they participate (attend meetings, vote, serve as delegate, hold executive post)
		Management (by gender)	Proportion of decisions about the focus crop made by women and by men
		Price received	Price received for focus crop by gender
		Education (by gender)	Number of household members through age 18 who have completed appropriate number of grades for age (disaggregated by gender)
Community	Participation	Community services	Community projects coordinated through a producer organization that someone from the farm was involved in (improvements in: agricultural facilities, access to water or sewage, medical care, road or school construction)
		Producer participation in organization	Intensity of producer's participation in producer organization indicated by number of ways they participate (attend meetings, vote, serve as delegate, hold executive post)
		Women's participation in organization	Intensity of women's participation in producer organization indicated by number of ways they participate (participate in meetings, vote, serve as delegate, hold executive post)
		Producer perception of organization's value	Producer's perceptions of the value obtained from specific producer organization services (marketing/price negotiation; physical services: cleaning, grading, storage, etc.; and trainings coordinated by producer organization)



SOCIAL

Trading Relationships	Transparency	Access to market information	Market information the producer reports knowing (price buyer receives, other local prices, global prices)
		Price transparency	Producer's understanding of the factors that affect the price they receive for focus crop (quality, consistency, variety)
	Capacity and Finance	Financial services	Financial or in-kind credit, grants, or other funding (e.g., premium distribution) available to producers through their buyer
		Production and post-harvest services	Market information, marketing support, extension services, and processing available from buyer to producer
Perception	Social Situation	Community services	Community projects supported by a buyer that someone from the farm was involved in (improvements in: agricultural facilities, access to quality water or sewage, medical care, road or school construction, etc.)
		Producer opinions on social issues	
		Community care of the environment	Producer's opinion of the community's care for the environment
		Social training	Producer's opinion on the value of social responsibility training programs: general perception of usefulness and indication of specific practices implemented as a direct result of training
		Quality of life	Producer's opinion of the overall quality of life for those on the farm



## ENVIRONMENTAL

We incorporate a range of environmental metrics including those in the categories of inputs and resource management, water and soil quality, waste management, good agrochemical practices, greenhouse gas sequestration and mitigation, and biodiversity. Our mapping functions help to contextualize the farm area at the scale of a regional landscape.

GLOBAL THEME	CORE ELEMENTS	INDICATOR	DESCRIPTION
Resource Management	Resource/input Management	Nutrient balance	Producer's method(s) to determine fertilizer needs (soil analysis report, advice or assessment of a professional, observation, knowledge of nutrient depletion by previous crop, etc.)
		NPK use and efficiency	Nitrogen, phosphorus, and potassium amounts in synthetic fertilizers used and compared to focus crop yields - indicates both efficiency and potential pollution
		Integrated pest management	IPM practices employed on farm
		Pesticides used	Amount of natural or synthetic insecticides, herbicides, fungicides, etc. that are used on focus crop
		Pesticide use efficiency	Pesticide use compared to level of losses from pest or disease
		Toxicity class of pesticides	Amount of active ingredients in pesticides by toxicity class
	Waste Management	Responsible waste management	Materials recycled, reused, or disposed of properly
		Water contamination prevention measures	Practices used to prevent water contamination from: crop processing wastewater, animals, domestic discharge, cleaning of agrochemical application equipment, etc.
Water	Water Quality	Safe water for domestic use	Household access to water they consider safe to drink
		Water contamination prevention measures	Practices used to prevent water contamination from: wastewater from crop processing, animals, domestic discharge, cleaning of agrochemical application equipment, etc.
	Water Quantity	Water conservation measures	Practices used to conserve water: drip irrigation, catchments, water-efficient processing, etc.
Soil	Conservation	Erosion	Severity and prevalence of observed erosion on farm (in relation to slope)
		Field maintenance	Method(s) used to clean annual crop areas after harvest (leaving crop residue as ground cover, cutting and raking into piles, burning, etc.)
		Soil conservation and measures to improve water use	Measures taken to conserve soil and improve water use by plants (contour planting, soil cover, live fences, hedgerows, buffer zones, soil berms, etc.)
		Nutrient balance	Producer's method(s) to determine fertilizer needs (soil analysis report, advice or assessment of a professional, observation, knowledge of nutrient depletion by previous crop, etc.)
		Intercropping	Interplanting species for soil health, diversification, fertility
		Local nutrient cycle	Recycling of organic matter and crop wastes
Biodiversity	Plant Diversity	Plant and tree diversity	Levels of biodiversity: cleared land or pasture, monoculture, 2-3 cultivated species (sparse trees), 4-10 cultivated species (some trees), crop presence with multi-strata forest, fully functional natural forest; practices followed that preserve or enhance biodiversity
	Genetic Diversity	Species and varietal diversity	Portion of focus crop(s) that are improved varieties (locally adapted or native heirloom varieties, selected to thrive in local conditions, hybrid, genetically altered, genetically selected); number of other crops or animal products produced on farm for sale, trade, or consumption



ENVIRONMENTAL

Biodiversity	Tree Density	Trees per hectare	Density of trees in farm habitats
		Forestation	Number and types of trees planted or removed; land area altered by planting or removing trees
Climate Change	Sequestration and Mitigation	Carbon stock	Number, size, type of trees and other perennial woody plants
		Land use change	Conversion of natural land (e.g., prairie, forest, savanna) to land used for cultivation or pasture, or conversion from cultivated or pasture land to natural land
Perception	Environmental Situation	Producer opinions on environmental issues	
		Farm's care of environment	Producer's opinion of the farm's care of the environment
		Community care of environment	Producer's opinion of the community's care of the environment
		Environmental training	Producer's opinion on the value of environmental training programs: general perception of usefulness and indication of specific practices implemented as a direct result of training



ECONOMIC

Economic indicators are typically the most visible and the most popular. Ours go beyond traditional measures of income, credit, and assets to include factors of risk, competitiveness, and organizational capacity. The general groups of economic indicators must not be interpreted in a vacuum but rather in balance with social and environmental factors that affect, and are affected by, economic conditions.

GLOBAL THEME	CORE ELEMENTS	INDICATOR	DESCRIPTION
Producer Livelihoods	Revenue	<b>Focus crop revenue</b>	Gross revenue from all sales of focus crop
		Yield	Total focus crop harvested per hectare
		Price	Average of sales price(s) received per unit of focus crop; min and max prices received per unit of focus crop
		Farm revenue	Focus crop revenue, other crop revenue, income from providing services (training, nurseries, land & equipment rental, etc.)
		Household revenue	Combined revenue from focus crop sales, other crops, other earnings (off farm employment, on-farm services provided, business revenue, and land & equipment rental), and gifts & remittances
	Costs	<b>Direct costs for focus crop</b>	
		Labor days	Days of paid and unpaid (e.g., household) labor used to produce focus crop
		Labor costs	Total cost of full time and part time paid labor to produce focus crop, and opportunity cost for unpaid labor
		Fertilizer costs	Amount paid for fertilizers--synthetic and natural--used on focus crop
		Pesticide costs	Amount paid for insecticides, herbicides, and fungicides--synthetic and natural--that are used on focus crop
		Renovation costs	Cost for seedlings, planting/grafting materials, bags, shade materials, etc. for focus crop
		Deductions by buyer	Amount deducted by the buyer from focus crop payments
		Energy	Costs for purchasing or producing energy for the farm (electricity, gasoline, LPG, diesel, solar, wind, hydropower, wood from forests, prunings, managed woodlot, etc.)
		<b>Indirect costs for focus crop</b>	
		Capital assets	Amount paid (amortized in some cases) for capital assets: equipment, irrigation, health clinic, worker housing, plumbing, sanitation, warehouses, etc.
		Cultivation practices	Costs for changes in cultivation practices: drip irrigation, conservation tillage, contour planting, etc.
		Traceability and record keeping	Labor and other costs incurred for record keeping and tracking inputs and practices
		Costs of standard or certification	Specific costs associated with obtaining the certificate and audit/inspection
		Planting and reforestation costs	Cost to buy plants and materials to grow trees and plants other than focus crop, and for the labor to plant the trees
	Training costs	Training fees, time, and cost for travel	
<b>Income</b>	Net income from focus crop	Total revenue from focus crop sales less total costs for focus crop production	
Risk (Economic Resilience)	Diversification	Revenue from other crops	Portion of total production revenue from other crops
		Area used for other crops	Portion of cultivated farm area used for other crops
		Number of other crops or animal products	Number of other crops (including those intercropped with focus crop) or animal products (meat, dairy, wool, honey, etc.) produced on farm for sale or for consumption
		Other revenue (not production related)	Farm revenue not related to production of crops or animal products including revenue from renting out land or equipment, services such as training, nurseries, etc.



ECONOMIC

	Information	Access to market information	Market information the producer reports knowing (prices buyer receives, other local prices, global prices)
		Price transparency	Producer's understanding of the factors that affect the price they receive for focus crop (quality, consistency, variety, etc.)

Risk (Economic Resilience)	Credit	Access to credit	Producer indicates that he or she could access medium sized production loan within a reasonable time, if needed; potential source of the loan
		Credit history	Amount of credit received by a producer compared to the amount of credit requested (if any); terms of the loan, repayment history
	Vulnerability	Poverty status	Comparison of household revenue to national (or regional if available) poverty line; PPI score evaluation of poverty propensity
		Minimum wage - producer	Comparison of a producer's net income per labor day to minimum wage
		Insurance	Producer has agricultural insurance policy in effect; terms of the policy
		Days without sufficient food	Consistent daily physical and economic access to sufficient, nutritious, satisfying food for all household members; Number of days in past year that any member of household cut food consumption due to lack of food; months of comparatively less food security
		Gender income differences	Total net income from focus crop on farms managed by women compared to farms managed by men
		Profit and loss	Producer's awareness of profit or loss from focus crop production and sales
Competitiveness	Business Development	Access to market information	Market information the producer reports knowing (price buyer receives, other local prices, global prices)
		Price transparency	Producer's understanding of the factors that affect the price they receive for focus crop (quality, consistency, variety)
		Farm price to global reference price ratio	Comparison of price paid to producer for focus crop to global reference price
		Quality awareness	Producer's awareness of the quality scores for focus crop
		Record keeping	Producer keeps records of costs and production data
		Business sustainability	Strength of producer's forecasting that he or she will remain a professional focus crop producer; strength of indication that producer would be happy if his or her children chose to become professional focus crop producers
	Differentiation	Practices for product quality in harvesting and processing	Specific product quality practices used by producer for harvesting and processing focus crop
		Product quality	Key quality measures for focus crop
		Control of certification or standard	Who owns the certificate or verification of standard compliance (producer, buyer, producer organization, etc.)
		Current standards and certifications	Number of current certifications or standards the farm holds
		Price premium	Premium paid or value delivered for meeting a quality standard or a certification



ECONOMIC

Competitiveness		Crop sold with a standard or as certified	Portion of total focus crop produced that is sold with a standard or as certified
	Efficiency	Production/labor (technical) efficiency	Quantity of focus crop produced per unit of input: fertilizer, pesticide, paid labor day, unpaid labor day
		Cost (economic) efficiency	Revenue from sales of focus crop per unit cost of input: fertilizer, pesticide, paid labor day, unpaid labor day
Producer Organization	Governance	Women's participation in organization	Intensity of women's participation in producer organization indicated by number of ways they participate (participate in meetings, vote, serve as delegate, hold executive post)
		Producer perception of organization's value	Producer's perceptions of the value obtained from specific producer organization services (marketing/price negotiation; physical services: cleaning, grading, storage, etc.; and trainings coordinated by producer organization)
	Services	Financial services	Credit or other funding (advance on inputs or grants) available through the producer organization
		Production and post-harvest services	Market information, marketing support, extension services, and processing available from producer organization to producer
		Community services	Community projects coordinated through a producer organization that someone from the farm was involved in (improvements in: agricultural facilities, access to water or sewage, medical care, road or school construction, etc.)
Perception	Economic Situation	Producer opinions on economic situation	Producer's opinion of their overall economic situation
		Business development training	Producer's opinion on the value of business development training programs: general perception of usefulness and indication of specific practices implemented as a direct result of training