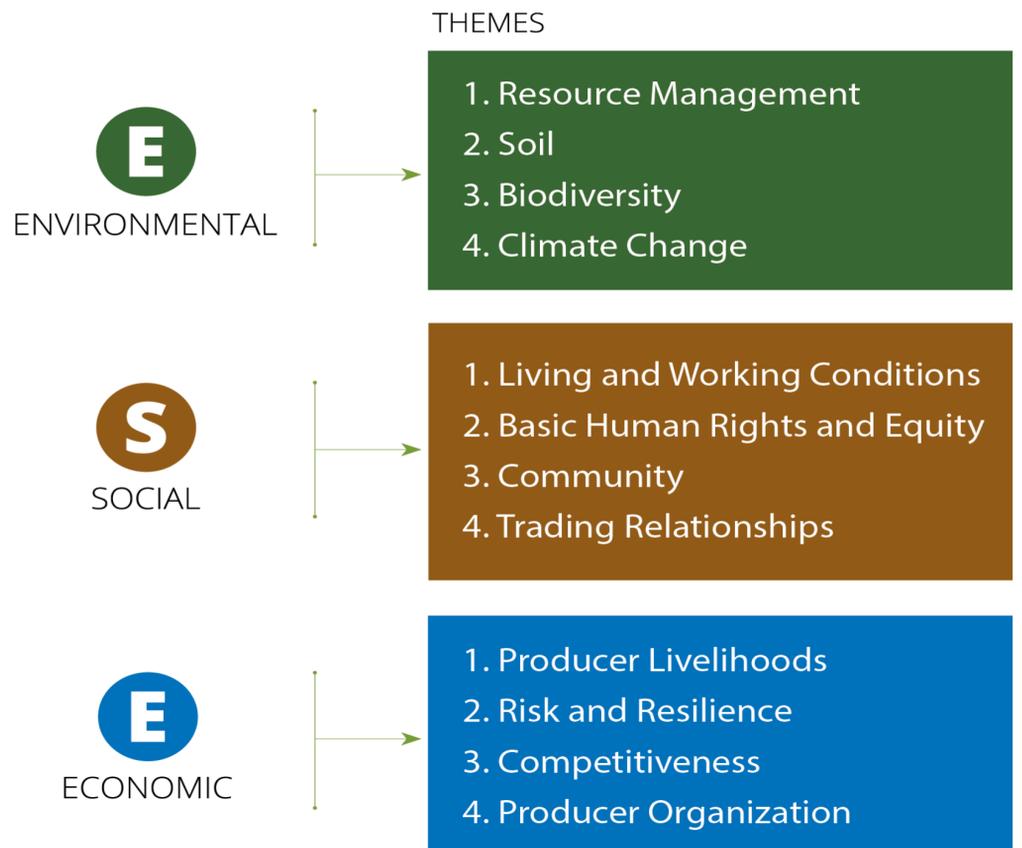


The COSA indicators are similar across all countries to allow for comparison, but are also adapted to allow for local contexts. Consistent indicators allow a shared understanding and a foundation for better management of sustainability.

***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.*

Our indicators are derived from a series of observed facts and reported perceptions. Taken in aggregate, data on the COSA indicators provide both easily interpreted performance metrics and a rich multi-dimensional understanding. They seek to meet SMART criteria and the questions related to them are widely field-tested to permit confident observations and interpretation. What an indicator covers is important but how we inform and communicate an indicator is where the greatest value of COSA's experience lies.



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.) |



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 | Pesticides | 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 |
| | | 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 |
| | | Energy* | Energy sources, costs for purchasing or producing, and use (electricity, gasoline, LPG, diesel, solar, wind, hydropower, wood from forests, prunings, managed woodlot, etc.) |
| | 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 cleaning | 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.) |
| | Soil Health | Intercropping | Interplanting species for soil health, diversification, fertility |
| | | 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.) |
| | | 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

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|-----------------------|-------------------------------------|--|--|
| 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 |



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 | Children spend time working on focus crop production |
| | | Minimum wage* | 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 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 groups* | Intensity of women's participation in producer groups 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 PO 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 groups* | Intensity of producer's participation in producer groups indicated by number of ways they participate (attend meetings, vote, serve as delegate, hold executive post) |
| | | Producer perception of group's value | Producer's perceptions of the value obtained from specific PO services (marketing/price negotiation; physical services: cleaning, grading, storage, etc.; and trainings coordinated by PO) |
| | | Women's participation in producer groups* | Intensity of women's participation in producer groups indicated by number of ways they participate (participate in meetings, vote, serve as delegate, hold executive post) |



SOCIAL

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|--------------------------------------|----------------------|---------------------------------------|---|
| 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 |
| | | 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.) |
| | Perception | Social Situation | 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 |



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 | Focus crop revenue | 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 |
| | | 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 | Direct costs for focus crop | |
| | | - 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 pesticides, herbicides, and fungicides--synthetic and natural--that are used on 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.) |
| | | Indirect costs for focus crop | |
| | | - 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 |
| | | - Reforestation costs | Cost to buy plants and materials to grow trees for trees other than focus crop, and for the labor to plant the trees |
| | | - Training costs | Training fees, time, and cost for travel |
| | Income | 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

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|---------------------------------------|-----------------------------|---|---|
| Risk (Economic Resilience) | 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.) |
| | 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* | 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

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|------------------------------|---------------------------|---|---|
| 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 per unit cost of input: fertilizer, pesticide, paid labor day, unpaid labor day |
| Producer Organization | Governance | Producer participation in groups* | Intensity of producer's participation in producer groups indicated by number of ways they participate (participate in meetings, vote, serve as delegate, hold executive post) |
| | | Women's participation in producer groups* | Intensity of women's participation in producer groups indicated by number of ways they participate (participate in meetings, vote, serve as delegate, hold executive post) |
| | | Producer perception of group's value | Producer's perceptions of the value obtained from specific PO services (marketing/price negotiation; physical services: cleaning, grading, storage, etc.; and trainings coordinated by PO) |
| | Services | Financial services* | Credit or other funding (advance on inputs or grants) available through the PO |
| | | Production and post-harvest services* | Market information, marketing support, extension services, and processing available from PO to producer |
| | | Community services* | Community projects coordinated through a PO 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 |