

Glossary

Aa

Afforestation- Establishing trees and forests in areas devoid of previous tree cover

African Climate Smart Agriculture Alliance- aims to empower 6 million smallholder farmers across Sub-Saharan Africa by 2021. Collaboration between governments, NGO's and research bodies to encourage smallholder farmers to adopt **Climate Smart Agriculture** practices. For more information <http://csa.octoplus.co.za/>

Agriculture- or farming, is the science and practice of cultivating soils for growing crops, forestry, and rearing livestock to provide resources to sustain and enhance human life

Agroforestry- Integrating trees into agriculturally productive landscapes provide **sustainable** benefits such as **soil fertility, resilience, food security**, timber and non-timber resources, fodder and natural **fertiliser**. For more information <http://www.worldagroforestry.org/about/agroforestry-our-role>

Alley Cropping- Planting trees in rows with wide spaces between the rows, called alleyways, where crops are grown. This diversifies farm income, increases productivity and improves **biodiversity** and the **environment**. For more information http://nac.unl.edu/documents/workingtrees/infosheets/WT_Info_alley_cropping.pdf

Bb

Biodiversity- The variety of micro-organisms, plants and animal life globally or in a specific place. It also includes genetic diversity and **ecosystem** diversity, i.e. the different interactions between organisms, air, water and soil. High biodiversity means a healthy **environment**.

Biomass- is all **organic matter**, living and recently living organisms. In terms of renewable energy it refers to plants and plant based materials used as an energy source. **Ecologically** it means the mass of living organisms in an area or **ecosystem**.

Cc

Canopy (or Crown) – The outer layers of branches and leaves of a tree or forest.

Carbon dioxide- Chemical Formula: CO₂. It is an odourless and colourless **greenhouse** gas. It enters the atmosphere through respiration by living organisms, and the burning of fossil fuels (i.e. coal, natural gas and oil). CO₂ is consumed by plants through the process of **photosynthesis**.

Carbon sink- is a reservoir that accumulates and stores carbon in various forms, including as carbonate and organic carbon. Reservoirs include oceans, and forests.

Carbon sequestration- is a natural or artificial process of capturing **carbon dioxide** and storing it in **carbon sinks**. This is for long-term storage to mitigate **climate change** and global warming.

Climate Change- the global change in weather patterns over a large period of time, this can cause weather extremes such as flooding or droughts, or exacerbate other issue such as **land degradation** and **desertification**. Currently the globe is experiencing an overall effect of global warming.

Climate Smart Agriculture (CSA)- are agricultural practices, systems and approaches that help to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure **food security** in a changing climate. CSA helps local, national, and international stakeholders identify agricultural strategies, including FMNR, suitable to their local conditions. For more Information <http://www.fao.org/climate-smart-agriculture/en/>

Compost- is decaying organic material used to **fertilize** growing plants.

Conservation-The act of preserving, guarding, protecting and sustainably using the **environment**, including for **biodiversity**, **natural resources**, and maintaining **ecosystem** health

Coppicing- is a traditional woodland management method that maintains trees at a juvenile stage. It involves cutting down young tree stems to ground level, i.e. a stump or stool, to stimulate growth of new shoots.

Crop Yields- is a measurement of harvested seed, grain, etc. within the cultivated land. This is usually measured by Kilograms per Hectare.

Dd

Deciduous- A tree or bush that loses its leaves in the winter months.

Decomposition- is a process whereby organic matter is broken down into **humus**, **nutrients**, energy, water, **carbon dioxide**, and/or minerals by microorganisms, fungi and bacteria.

Deforestation- clearing land from trees and other plants. This can be due to needing timber or repurposing the land for other uses such as **agriculture**.

Desertification- is when dry land loses water, vegetation and wildlife. The climate becomes increasingly arid. Arable land becomes unproductive. This is a type of land degradation.

Diameter at breast height- The diameter of a tree at 1.3m, or breast height, above the ground, on the uphill side. The diameter is measured in cm and can used to calculate the volume of timber in a stand.

Ee

Ecology- The study of the relationships between different forms of life, animals, plants, and microorganisms, and their surrounding environment. It also refers to the political movement to protect the **environment**.

Ecosystem- A complex network of a biological community of living organisms, plants, animals and microorganisms, and the physical **environment**, including air, water, and soil.

Ecosystem services- The capacity of the **environment** to provide benefits, such as clean air, water, food, oxygen, **soil fertility**, **biodiversity**, and **nutrients**, for human benefits and provide a reasonable quality of life.

El Niño- the El Niño Southern Oscillation (ENSO) is a band of warm surface water that develops on the Pacific Ocean between South America and Australia/ South East Asia. It reduces rainfall over Indonesia, the Philippines and Australia, while causing high rainfall on the west coast of South America. <http://www.bom.gov.au/climate/glossary/elnino.shtml>

Environment- The natural world including animals, plants and physical features such as land, water, soil, and atmosphere. It also refers to surroundings.

Evapotranspiration- The process of water being removed from the land and transported to the atmosphere. Moisture is removed from soils by evaporation and is removed from plants by transpiration.

EverGreen Agriculture- integrates trees with food crops and livestock to create more **sustainable** and productive agricultural systems for small holder farming families. Including trees for fuel, fertilizer, food, fiber (timber) and fodder. For more information <http://evergreenagriculture.net/what-is-evergreen-agriculture/>

Ff

Fallow- farmland that has been left without sowing seeds for a period of time, so that **soil fertility** can have time to restore or to minimize production surplus.

Farmer Managed Natural Regeneration (FMNR)- is a low cost land restoration technique that involves protecting and managing regrowth sprouting from root systems and seeds on farmland. This helps restore soil structure and fertility, inhibit erosion and soil moisture evaporation, rehabilitate the water table, and increase biodiversity. It is used to combat poverty and hunger amongst poor subsistence farmers by increasing food and timber production and resilience to climate extremes.

Feedback Loops- Is a cyclic system where the outputs eventually influence the inputs of the same system. For example tree leaves that fall release nutrients into the soil when they decompose, the nutrients are then taken up again by plants and cause more leaves to grow and then fall, providing even more **nutrients**. This is a positive feedback loop. There are also negative feedback loops where the output undesirably affects the inputs of the system.

Felling- the cutting down of a tree

Fertiliser- Any natural or synthetic material that is used on soils or plant tissue to provide **nutrients** for plant growth

Food and Agriculture Organization of the United Nations (FAO) - An intergovernmental organization that focuses on defeating hunger. It also looks at the complex challenge of governing development-related processes that affect **food security, nutrition**, livelihoods, and the management and **sustainable** use of **natural resources**. For more information <http://www.fao.org/about/who-we-are/en/>

Food Security- When all people at all times have equal access to sufficient, safe and nutritious food that meets dietary needs and food preferences for an active and healthy life. For more information <http://www.fao.org/economic/ess/ess-fs/en/>

Gg

Geographic Information System (GIS) - is a computer system that captures, stores, manipulates, analyses, manages and presents spatial and geographical data. This helps us interpret data to understand relationships, patterns and trends. For more information <http://www.esri.com/what-is-gis/howgisworks>

Geographical Positioning System (GPS) – This is a global navigation satellite system that provides location and time information, including latitude and longitude. This information assists with long term monitoring and comparisons

Grafting- is a technique where the top of one tree is cut back leaving the roots and lower part of the tree (rootstock), then an upper part of a different tree (scion) is attached/grafted to the rootstock.

Greenhouse effect- when greenhouse gases such as **carbon dioxide**, methane or chlorofluorocarbons help trap the sun's heat in the Earth's atmosphere. If too much of the greenhouse gases are released into the atmosphere, such as from burning fossil fuels or deforestation, **climate change** and global warming occurs

Groundwater- is when water migrates to below the surface of the earth, to be stored in soils or rock called aquifers. This can be a good source of water and is accessed using bores and wells.

Gully- an erosion channel more than 30 cm deep

Gully Erosion- when excessive runoff of water, from rainfall, washes away soil to form gullies.

Gully Reclamation- the process of improving land and stabilizing soils that have been damaged by **gully erosion**. This is achieved by filling with other soil, planting vegetation or constructing a dam-like barrier to trap runoff and sediment.

Hh

Holistic Management- a system of managing resources that considers the complex and mutualistic interactions between people, animals, plants and the land. The aim is to be flexible, adaptable to different conditions and environments, and take a broad approach to solving issues.

Humification- is the conversion of dead **organic matter**, through decomposition by bacteria and fungi, into humus, a dark substance full of nutrients. The humus is then washed into the soil by rain providing the plants with the nutrients they need.

Hectare- A unit of measurement that equals 2.47 acres, or 10,000 square meters

Ii

Indigenous- originally or naturally occurring in one a particular place. In reference to plants, it is where it has evolved and grown naturally with no human intervention. In reference to humans as having a distinct cultural and historical relation to an area.

Inorganic- a compound, material, mineral or chemical that is not organic, usually do not contain carbon and not from a living being

Jj

Kk

Ll

La Niña- is a phase of the **El Niño** Southern Oscillation, it is when surface temperatures of the central and eastern Pacific Ocean experiences cooling. This is accompanied by higher rainfalls over tropical Australia, Papua New-Guinea, and Indonesia.

<http://www.bom.gov.au/climate/glossary/lanina.shtml>

Land Degradation- is where land has been negatively affected by human activity. It is the exploitation of soil, vegetation and/or water which leads to a decrease in quality of those **natural resources**

Mn

Machete- a broad, heavy knife used as a tool

Alternatives: Axe, Blade, Cleaver, Hatchet, Kapmes, Knife, Panga,

Macronutrient- a **nutrient** that is required in a large amount for a plant to grow

Minimum tillage- is a system of soil conservation that does not turn soil over and changes the soil structure, but instead leaves 30% crop residue and minimizes soil erosion.

Techniques include No tillage, Strip-Till (only narrow strips are tilled for seed planting),

Mulch till, Rotational tillage (tilling every two or so years), Ridge-till and Zone tillage (where only small strip is tilled below the crop row)

Mulching- to cover or surround plants with mulch, made of straw, plastic sheeting or organic matter, as a protective layer against evaporation, freezing of roots, **soil erosion**, and growth of weeds. It also enriches the soil like a fertiliser, improving **soil fertility**

Nn

Natural Resources- The materials and substances of the **environment** that are most useful to humans, providing basic needs or exploited for economic gain. They include land, water, plants, animals, minerals and energy.

Nitrogen Fixation- a process whereby bacteria converts atmospheric nitrogen (N_2) to ammonium (NH_3) making the nitrogen more readily available for plants to use. Nitrogen-fixing trees contain a symbiotic bacteria called rhizobia within nodules in the roots which perform the process.

Nutrients- substances that provide nourishment that is essential for living organisms and for their growth. Includes Carbon, Calcium, Nitrogen, Phosphorus, and Potassium

Oo

Organic Matter- Carbon-based material from animals and plants, includes fallen fruit, leaves, branches, twigs, stems and any other products dropped by plants or animals. When the organic matter decomposes it improves soil fertility, and helps retain soil moisture

Over clearing- clearing too much vegetation for agricultural purposes causing **land degradation**, and endangering **biodiversity** and **ecosystems**

Overgrazing- allowing livestock and animals to intensely graze pastures and **rangelands** for extended periods of time. This cause's **land degradation** including damage to vegetation, soil is compacted and hardened, and higher susceptibility to **soil erosion**

Pp

Permaculture- agricultural systems that are developed to be sustainable and self-sufficient. It emphasises the simulation of natural processes.

Photosynthesis- the process by which plants, and some bacteria, produce energy. Light energy from the sun, water, and carbon dioxide is converted to energy stored in the bonds of glucose, and oxygen.

Pollarding- system of pruning that involves removing the upper branches of a tree to promote a dense growth of foliage and branches. This usually done for fodder (i.e. pollard hay) or for wood. This is also preferred over coppicing in pastures and grazing land, where livestock would browse the regrowth from coppice stumps.

Pollination- is the way in which plants reproduce. Pollen from one plant is dispersed by wind, water or animals such as insects or birds, and is transferred to another plant for fertilisation to start producing seeds

Pruning- To trim or cut away dead or overgrown branches, stems and leaves, often stimulating growth and maintaining tree health

Qq

Rr

Rainfall – The quantity of rain falling in an area in a given time. Rainfall Intensity is the rate of rainfall in during a specific time, expressed in millimetres per hour (mm/h)

Rangeland- open land that is used for grazing or hunting animals, includes prairies, grasslands, shrub lands, woodlands, wetlands, savannahs, tundras and deserts.

Reforestation- re-establishing tree and forest cover in previously depleted areas, usually through **deforestation**

Resilience- The capacity to recover quickly from difficulties. In the instance of FMNR it can mean recovery and resistance to such shocks as climate extremes or economic crashes

Ss

Sapling- a young tree with a slender trunk under 10 cm in diameter at breast height

Seedling- a very young plant that was been grown from a seed, usually under 1 meter in height

Slash and Burn Farming- is a farming method where the natural vegetation is cut down and burned to clear the land for **agriculture**

Soil Erosion- Is the wearing away of the fertile topsoil by water or wind. This is caused when soil is loose due to lack of tree roots, and farming activities such as tillage. This is reduced when trees are planted because the roots hold the soil, absorb water and become effective wind barriers.

Soil Fertility- This is the ability for soil to sustain plant life and crops by providing the nutrients and water needed for their growth. This includes good drainage, soil depth for root growth, absence of toxins, balanced acidity, adequate amounts of **nutrients**, and the presence of biodiversity, such as soil bacteria, fungi, and worms.

Soil Moisture- is the quantity of water in the soil. This is an important factor because it controls the exchange of water and heat energy between the land and atmosphere through evaporation and plant transpiration

Subsistence- The minimum of maintaining and supporting oneself or a household. There is a dependence on natural resources for basic needs, through subsistence farming, hunting and gathering. This means that surplus for selling or trading is not available.

Sustainability- Is the ability to sustain, and support over the long term. Sustainable development means meeting the needs of today without compromising the needs of the future. Environmental sustainability is the ability to use natural resources without adversely affecting ecological health and maintaining it for the future. In agriculture it is the conservation of soil, vegetation and water to ensure food supplies and continued productivity and profitability for farmers.

Tt

Topsoil- is the upper 5 to 20 cm layer of soil. It is usually darker than the subsoils beneath, because it has a higher content of **organic matter** and **humus**. It is the most fertile, therefore the most important part for agriculture and needs to be protected.

Uu

Vv

Ww

Windbreak- is a dense row of trees planted to provide shelter from the wind, while also reducing wind erosion.

World Agroforestry Centre (ICRAF) - ICRAF generates science-based knowledge about the diverse benefits - both direct and indirect - of agroforestry, or trees in farming systems and agricultural landscapes, and disseminates this knowledge to develop policy options and promote practices that improve livelihoods and benefit the environment. For more information <http://www.worldagroforestry.org/>

World Resources Institute (WRI) – is a global research organization that works internationally to focus on critical issues of environment and development, to sustain our natural resources for economic opportunity and human well-being. For more information <http://www.wri.org/>

Xx

Yy

Zz

Zai Pits (or Tassa) – A framing technique that involves digging pits about 20 to 30 cm deep and 90 cm apart during pre-season to catch water and concentrate compost and organic matter. Seeds are planted in the pits. It can be often used to improve bare soils in drought or low rainfall, or where the soils are hard and difficult to plow, it can still provide enough productivity for food. For more information

https://c.ymcdn.com/sites/echocommunity.site-ym.com/resource/collection/27A14B94-EFE8-4D8A-BB83-36A61F414E3B/TN_78_Zai_Pit_System.pdf