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Kenya Agricultural & Livestock Research Organization

MESPT
MICRO ENTERPRISES SUPPORT PROGRAMME TRUST

MINISTRY OF FOREIGN AFFAIRS OF DENMARK
Danida

Export Vegetable Manual

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Disclaimer

This manual is for advisory use only. Users should verify details that relate to their agro-climatic zones from their area agricultural extension officers. It is also advised that this manual should be used in conjunction with the respective value chain trainers' guide and other relevant resource materials.

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Foreword

The Micro Enterprises Support Programme Trust (MESPT) is a local development organization founded in 2002 through a partnership between the Government of Kenya (GoK), the European Union (EU), and later, the Royal Danish Government. MESPT's main goal is to eradicate poverty by supporting the growth of micro-enterprises, including agricultural production, agribusiness, and afro-processing. This support aims to foster social, economic, and environmentally sustainable growth by increasing access to financial and business development services, creating jobs, and promoting sustainable micro-enterprises. Our vision is to build a more prosperous society, and our mission is to provide sustainable business development and financial services to smallholder farmers and agri-MSMEs in Kenya.

For over two decades, our team of professionals has been at the forefront of developing cost-effective and scalable solutions that promote financial inclusion and support the growth of sustainable agribusinesses. We accomplish this by providing tailored financial solutions that meet the specific needs of various agricultural value chains, delivered through a wholesale lending model to financial service providers such as SACCOs, MFIs, and Farmer Cooperatives. These providers, in turn, extend loans to smallholder farmers and micro agricultural enterprises.

Our approach emphasizes delivering integrated financial and business development services to smallholder farmers and MSMEs in Kenya, helping them access finance, boost agricultural productivity, improve afro-processing and connect to markets. Over the years, we have worked closely with county governments, development agencies, donors, and investors to strengthen business development capacities in the agricultural sector, using a unique tripartite model that connects farmers, SMEs, and financial institutions.

Vegetable is among key value chains that have been supported by MESPT over the years through various interventions in order to enhance commercialization. MESPT appreciates the importance of documenting best practices for the value chain in facilitating effective delivery of training for farmers and Agri-preneurs. Therefore, MESPT has facilitated the development of this manual alongside the value chain trainers' guide and other resource materials through Green Employment in Agriculture Programme (GEAP) with support from DANIDA.

This guide is expected to enhance effectiveness in delivery of trainings on Good Agricultural Practices and commercialization of the value chain. I am optimistic that this manual will be helpful to partners in the value chain including county governments. I am grateful to DANIDA for the continued support to MESPT programmes. I am also thankful to the value chain experts who spearheaded compilation of this manual.

Rebecca Amukhoye,

Chief Executive Officer, Micro-Enterprises Support Programme Trust

Preface

The Green Employment in Agriculture Programme is a 5 years' programme (2021 to 2025) funded by DANIDA and implemented by Micro-Enterprises Support Programme Trust (MESPT). GEAP seeks to contribute directly to Kenya's vision 2030 and to one of Denmark-Kenya Strategic Framework on accelerated decent employment creation in MSMEs and improved competitiveness of targeted value chains in agriculture which will contribute to transforming the economy towards a greener and more inclusive growth.

GEAP programme targets 40,000 smallholder farmers and will be implemented in 12 counties namely, Kilifi, Kwale, Nakuru, Nyandarua, Siaya, Kisii, Kakamega, Bungoma, Trans Nzoia, Uasin Gishu, Makueni and Machakos. The programme facilitates increased commercialization, decent employment, and green transformation through targeted interventions in selected agriculture value chains that include, Cassava, Coconut, Dairy, Export Vegetables, Pineapple, Indigenous Poultry, Moringa, Pineapple, and Aquaculture.

MESPT through GEAP tasked multidisciplinary teams to develop resource materials tailored for extension service providers and farmers. This export vegetables value chain manual is one of the series of the materials that were developed. MESPT further tasked value chain experts to develop a value chain trainers' guide for export vegetables. This manual is to be used as a reference material for training on implementation of good agricultural practices, value addition and marketing for the value chain. Relevance of the content is based on needs identified among value chain players, actors and aligned to GEAP project objectives.

MESPT is grateful to the value chain experts who spearheaded the development and production of this manual. It is my hope that counties and other users will adopt and optimally use this resource so as to increase productivity and profitability while ensuring a greener and more inclusive growth.

Doreen Kinoti

Programme Manager, Green Employment in Agriculture Programme

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The Green Employment in Agriculture Programme (GEAP) participating counties (Kilifi, Kwale, Nakuru, Nyandarua, Siaya, Kisii, Kakamega, Bungoma, Trans Nzoia, Uasin Gishu, Makueni and Machakos) are acknowledged for providing resource persons in compilation of the document. The technical support and expertise provided by Kenya Agricultural and Livestock Research Organisation in development of the document is appreciated. Thanks to the Royal Danish Government's Danish International Development Agency (DANIDA) for facilitating the development of this resource material. Micro Enterprises Support Programme Trust (MESPT) is appreciated for co-ordinating the process of development and production of this document.

Table of Contents

Export Vegetable Manual

Abbreviation and Acronyms

AEZ	Agro-ecological zone
AFA	Agricultural food Authority
APVC	Agricultural product value chain
ASAL	Arid and semi -arid land
CIG	Common interest Group
CSA	Climate smart Agriculture
CTT	Core team of Trainers
DANIDA	Danish International Development Agency
GAP	Good Agricultural practices
GAP	Good Agricultural Practices
GEAP	Green Employment in Agriculture Programme
Ha	Hectare
IDM	Integrated disease management
INRM	Integrated Natural Resource Management
IPM	Integrated pest management
ISFM	Integrated soil fertility management
IWM	Integrated weed management
KALRO	Kenya agricultural and livestock Research Organization
KG	Kilogram
LF	Lead farmer
MESPT	Micro Enterprises Support Programme Trust
SPs	Service providers
VMG	Vulnerable and marginalized group

Chapter 1: Introduction

1.1 General Information

The Export vegetable sub sector in Kenya is important in attaining food security and improving livelihoods for smallholder farmers who produces 95% of the export vegetables. The production of the export vegetables is through contract farming. These vegetables are highly perishable with limited shelf life after harvesting and are highly dependent on cold chain technology to maintain their quality.

The major export vegetables produced in Kenya are French beans, snow peas, sugar snaps, garden peas, baby corns, broccoli among others with major markets being the European Union and major supermarkets. The success of this industry has been sustained due to the high quality of the produce and compliance to International standards and market requirements.

1.2 Agro-Ecological Requirements for French Beans Production in Kenya

French beans farming in Kenya require specific ecological conditions to ensure optimal growth, yield, and quality of the crop. These ecological requirements encompass a range of factors, including climate, soil, and water management.

1.2.1 Suitable Climate for French Beans Farming in Kenya

French beans are a warm-season crop that thrives in tropical and subtropical climates. Key climate factors for successful French beans farming include:

- Temperature: French beans require temperatures between 18°C and 27°C (64°F to 81°F) for optimal growth. They are sensitive to frost and cold temperatures, so planting should be timed to avoid the coldest periods.
- Sunlight: Adequate sunlight is essential for photosynthesis and pod development. French beans thrive in full sun, receiving at least 6 to 8 hours of direct sunlight daily.

1.2.2 Soil Requirements on French Beans Farming in Kenya

The right soil conditions are crucial for French beans cultivation. The following soil characteristics are important:

- Texture: Well-drained sandy loam to loam soils are ideal for French beans. These soil types provide good aeration and water drainage, preventing waterlogging that can lead to root rot.
- pH Level: French beans prefer slightly acidic to neutral soils with a pH range of 6.0 to 7.5. Soil pH influences nutrient availability and can affect plant health and growth.
- Fertility: Soil fertility is important for high yields. Prior to planting, a soil test is recommended to determine nutrient levels. Adequate levels of nitrogen, phosphorus, and potassium, as well as micronutrients, are crucial for optimal growth.

1.2.3. Water Management on French Beans Farming in Kenya:

French beans are grown under rainfed or irrigation systems. In areas that require to supplement water requirements, proper irrigation is essential for French beans farming, as the crop requires consistent moisture for uniform growth and pod development. Key considerations include:

- Irrigation Method: Drip irrigation is often recommended for French beans, as it provides precise control over water application and reduces the risk of foliar diseases.
- Watering Frequency: The crop should receive regular, evenly distributed water. Water stress during flowering and pod development can lead to reduced yields and pod quality.
- Avoid Waterlogging: Adequate drainage is important to prevent waterlogging, which can lead to root diseases and reduced plant health.

1.2.4. Altitude and Agro-Ecological Zones for French Beans Farming in Kenya

French beans can be cultivated at different altitudes and agro-ecological zones within Kenya. Different varieties may be suitable for specific zones, so farmers should select varieties that match the local conditions.

French beans in Kenya have several notable varieties, each with distinct characteristics tailored to meet specific market demands and growing conditions. These varieties have been developed to address factors such as taste, appearance, disease resistance, and adaptability. Here are some of the prominent French bean varieties in Kenya, along with their key characteristics and production considerations. They can be classified into two categories, Fresh and Processing types. Fresh Market varieties include Serengeti, Amy, Pekara, Teresa, Paulista, Rexas, Samantha, Belcampo and Cupvert while processing types include Julia, Ogandi, Vernandon and Sasa.

Chapter 2: Planting Materials and Propagation

2.1 Planting French Beans

- The farmers should prepare land early enough to allow weeds to dry and decompose before planting.
- Propagation of French beans is by seeds directly sown into the field.
- Use certified seeds from reputable seed suppliers.
- The farmer should plant French beans at the onset of the rains if production is rain-fed.

2.2 Spacing French Beans

Single rows 30 x 15 (1 seed per hole) or double rows 60 x 30 cm may be used. The spacing will depend on the variety, soil fertility, water availability as well as climate. It is advisable to plant in blocks of about 4 rows separated by a path of about 50 cm. The seed rate required is, 25-60kg/ha (10-24kg/acre) of certified seeds depending on the variety.

2.3 Fertilizer and manure application on French beans farming in Kenya

- Apply 200 kg/ha (80kg/acre) DAP along the rows before planting. Contact between fertilizer and seed should be avoided by mixing the fertilizer thoroughly with the soil during planting. .Apply 150-kg/ha (60kg/acre) Calcium ammonium nitrate (CAN), as a top dressing in a split application. First split is applied when 2-3 leaves appear and the second at the beginning of flowering.
- Excessive nitrogen should be avoided as it may promote vigorous vegetative growth at the expense of pod production.
- Foliar feeds are recommended to boost crop development and production. The choice of the fertilizer depends on the fertility of the soil and variety requirements.
- Use of farmyard manure is also recommended especially where soils are low in organic matter e.g. on the heavy clay and sandy soils. It should be applied in planting furrow and worked into soil before planting at the rate of 10 tons/ha

Chapter 3: Crop Management

3.1 Crop rotation

This practice is recommended to avoid pest and disease build up. Rotation is mainly done with cassava, maize, sorghum or any other non leguminaceae family member crop.

3.2 Weed control

- Timely and thorough weeding is absolutely essential. The first weeding should be done 2-3 weeks after emergence followed by a second weeding 2-3 weeks later.
- Care should be taken to avoid damaging the shallow roots especially during the first weeding.
- The crop should not be weeded at flowering time and when the field is wet to avoid flower shedding, spread of diseases and soil compaction. Use of herbicides may be economically feasible for the commercial French beans grower. Pre-emergence herbicides can be used.
    -

3.3 Plant Nutrition, Fertilizer Use and Irrigation

3.3.1. Fertilizer Usage;

-
    • A written fertilizer plan shall be developed based on soil/ plant analysis.
    • This analysis shall be regularly conducted to evaluate the fertilization plan.
    • Chemical fertilizers shall be applied based on nutrient requirements of crop
    • Or on receipt of technical advice.
    • Detailed Records of fertilizer application shall be established/documented.
    • Trained/ competent employees shall be responsible for fertilization program.
    • Application equipment shall be kept in good condition.
    • Equipment shall be calibrated to ensure accurate fertilizer application.
    • Fertilizer shall be stored in a secure facility to avoid polluting environment.
    •There shall be a well-managed fertilizer stock inventory/regularly updated
    Organic Fertilizers;
    • Use of organic manure is encouraged for maintenance/ improvement of soil fertility/ texture
    • The use shall be in designated areas away from water
    • Risk assessment before use is vital to consider the source
    • To show that potential risk of disease transmission, weed seed and method of compositing have been considered

1.1.2 **Irrigation**

- • **Water Management:**
    • Document irrigation plan to optimize water usage/minimize wastage
    • Farmers shall be conversant with of soil- water relations concepts.
    • This enables water requirements to be accurately estimated
    • Optimal water use with minimal wastage e.g. drip irrigation etc.
    • Water management may be supported by documentations on calculations of crop water requirements.
    • Operators shall maintain water use records and source permits.
    • Operators should undertake water harvesting / recycling on farm.

• This will help reduce dependency on the natural resource for sustainability.

- **Quality of Irrigation water:**
  • Operators shall do complete risk assessment of irrigation water sources annually
  • For potential microbiological/chemical/ physical pollution of the water sources.
  • The analysis shall be done by accredited laboratory.
  • Untreated sewage water and effluent shall not be used for irrigation purposes.

1.1.3 Crop Protection, Pesticide Use and Procurement

- **Control of Pests and Disease:**
  • Operator shall source disease free planting materials / certified seeds
  • The operator to monitor pest/disease in the farm/ facility.
  • This Periodic scouting will ensure early detection of pests/diseases
  • This will facilitate timely control/ management (timely action)
  • The operator to ensure all activities /tools of work minimize pest & disease risk.
  • Operator to employ pest and disease management strategies e.g. IPM
  • that are effective/ minimizes on chemical use/that keeps pest levels below economically damaging thresholds.
  • Only registered pest control products /approved shall be used.
  • Products shall be chosen to avoid over reliance /continued use of any single chemical grouping.
  • Use of curative (systemic/absorbed by plant) products to be given priority.
  • Quantities needed (curative /systemic) to achieve control are much less.
  • A competent staff to be responsible for control of pest and diseases.
  • Avoid application in adverse weather conditions such as wind, rain etc.

- **Procurement of Pesticides**
  Operators should procure pest control products from PCPB registered sources or licensed distributors.
  • Receipts shall be kept for records (for at least 12 months).
  • Register of all pesticides types used in the farm shall be maintained.
  Transport of Pesticides and Hazardous Chemicals:
  • Written procedures for transportation of pesticides shall be developed and communicated to staff concerned.
  • Pesticides to be transported in a suitable, self- container / separately.
  • Not together with food/animal feed / general consumer goods.
  • Drivers and turn-boys to be trained in emergency procedures. In the event of accident/ fire, spillage and direct contact with persons.
  • Proof of training by a recognized organization be kept
  • Vehicles used to transport pesticides be provided with suitable equipment and materials to deal with emergencies e.g protective clothing, fire extinguishers, sand shovel, etc.

- **Storage of Pesticide and Hazardous Chemicals**
  • Chemical store be of sound structure/locked / well ventilated.
  • Chemical store shelves should be made of non-absorbent non-flammable materials.

• Materials to deal with leakage and spillage are available in store.
• Only approved pesticides in original labeled containers shall in store.
• No other commodities stored with pesticides.
• Storekeepers to receive training regarding pesticide storage, dispensing & handling procedures.
• Written procedures developed for handling in case of accidents.
• These procedures should be displayed in languages understood by users.
• Stores shall be equipped with adequate/ appropriate firefighting equipment.
• Maintenance records of fire extinguishers be kept

- Application of Pesticides and Protection of Workers:
  • Operators to ensure workers are given information/ instructions/trainings and guidance necessary to undertake application.
  • Spray equipment shall be regularly inspected/well maintained/calibrated by..
  • Application equipment shall be dedicated to intended use.
  • This is to prevent cross contamination of pesticides
  • Operators to wear PPEs suitable for the task at hand.
  • PPEs shall have designated area for washing/ drying/storing.
  • Appropriate dressing rooms / individual lockers for each worker be provided.
  • No pregnant and nursing mothers or < 18 years shall handle pesticides.

- **Pesticide Application Records:**
  • The operator shall maintain pesticide application records;
  • Crop protection products application records on treated crops
  • Detailed spray records on products used
  • Record of spray operators
  • A spray supervisors log book
  • Spraying machines logbook showing calibration checks/ dates etc.
  • List of personnel authorized to access pesticide stores.
  • Records of all trainings done.

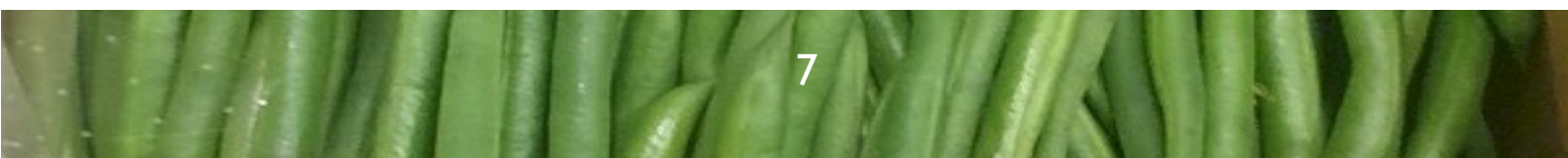
1.1.4 Disposal of Surplus, Unwanted and Empty Containers

- **Farmers should designate disposal pits in the farm for disposal of unwanted and empty containers**
  • Disposal shall be in compliance with NEMA requirements &approved procedures.
  • Disposal sites shall be away from surface water/boreholes as per regulations.
  • These sites shall be securely locked /fenced off with marked warnings.
  • Secure storage point for empty containers and ensure non-exposure to persons.
  • Empty containers triple rinsed and punctured/crushed to avoid reuse
  • Agents outsourced for disposals must be approved by NEMA and PCPB.

Chapter 4: Integrated Soil and Water Management Practices for Export Vegetables Production

4.1 Irrigation

- Constant supply of water is very essential because soil moisture affects yield, uniformity and quality of French beans.
- Water stress during flowering and podding causes flower abortion and curved pods leading to reduced yields.
- French beans are very sensitive to waterlogged conditions. Therefore, where the soils are not well drained such as the black cotton soils, it is advisable to grow them on ridges. In such soils, furrow irrigation with the beans planted on the ridges is a better practice than the common system of basin irrigation. Either furrow or an overhead system of irrigation may be used.
- The irrigation regime below is based on crop water requirement at various stages of growth as well as the soil and weather conditions. The recommendation are as follows:
  - Planting to 10 days (Post emergence) apply 35 mm per week
  - 10 days Post emergence to flowering blooms apply 50 mm per week
  - At Podding stages apply 35 mm per week.



Chapter 5: Export Vegetables Crop Health – Pests and Disease Management

5.1 Integrated Pest and Disease Management (IPM):

Integrated Crop Management aims at producing crops using sustainable agriculture whilst having minimal impact on the environment. With respect to the control of pests and diseases, it's a way of controlling their population and incidence using a combination of the following methods.

Pest Surveillance

Weekly monitoring through pest scouting with the help of monitoring device like pheromone traps, colored sticky traps should be practiced. For field scouting 300 fruits in 100 plants/ acre in across diagonal pattern through zig zag manner is required to be observed for counting of each and every type of insects. Pest monitoring for fruit flies using Cue-lure traps should be done regularly from fruiting stage onwards. If 95% plants are found free from insect pests then the field will be considered fit for export Regular scouting, timely action, and a combination of these strategies can help minimize the impact of pests and diseases on French beans production and contribute to higher yields and better-quality produce.

Other recommended IPM practices include;

- Crop rotation
- Use of disease-resistant varieties
- Proper spacing and plant density
- Early detection and monitoring
- Cultural practices (sanitation, removal of infected plant material)
- Biological control (predators and parasites)
- Chemical control (using approved pesticides judiciously)
- Application of fungicides and insecticides as needed, following recommended guidelines

1.2 Common Pests:

5.2.1 Aphids (Aphis spp.):

Aphids are small, sap-sucking insects that can distort plant growth, cause leaf curling, and transmit viruses. They reproduce rapidly and can lead to significant damage if left unchecked.

Source: Growveg, https://www.growveg.co.uk/garden-planner-intro.aspx

Symptoms

Small soft bodied insects on underside of leaves and/or stems of plant; usually green or yellow in color, but may be pink, brown, red or black depending on species and host plant; if aphid infestation is heavy it may cause leaves to yellow and/or distorted, necrotic spots on leaves and/or stunted shoots; aphids secrete a sticky, sugary substance called honeydew which encourages the growth of sooty mold on the plants.

Cause

Insect

Comments

Distinguishing features include the presence of cornicles (tubular structures) which project backwards from the body of the aphid; will generally not move very quickly when disturbed.

Management

If aphid population is limited to just a few leaves or shoots then the infestation can be pruned out to provide control;

Use tolerant varieties if available;

Reflective mulches such as silver colored plastic can deter aphids from feeding on plants;

Sturdy plants can be sprayed with a strong jet of water to knock aphids from leaves;

Insecticides are generally only required to treat aphids if the infestation is very high - plants generally tolerate low and medium level infestation

Whiteflies (Bemisia tabaci):

Whiteflies are tiny insects that feed on plant sap, causing yellowing, wilting, and the development of sooty mold. They are also known to transmit plant viruses.

Source: https://plantwiseplusknowledgebank.org/doi/full/10.1079/pwkb.20157800054

Identification:

• The adults are 1 – 3 mm long

• Their bodies are entirely covered by white waxy bloom

The nymphs are greenish white, oval inoutline, scale-like and shiny

Damage:

• Infested plants are low in vigour, may wilt, turn yellow in colour and eventually die

Control:

• When populations builds up, spray using

recommended chemicals:

– Lambda Cyhalothrin (Karate 2.5WG®)

– Thiamethoxam (Actara 25WG®)

– Deltamethrin (FARM – X 2.5EC®)

– Alpha cypermethrin (SUPREMO 100EC®, TATA ALPHA 10EC®, CYRUX 10EC®

Thrips (Frankliniella spp.):

Thrips damage plants by piercing the leaves and sucking out the cell contents. This results in silvering, stippling, and deformation of leaves, affecting the overall health of the plant.

Source: https://infonet-biovision.org/

Identification:

Adults are small (3 mm long) and shiny black with clear wings

The larvae/maggots are cream with dark mouthparts and reach 3 mm in length

• Pupae are small, brown and cylindrical with rounded ends

Damage:

Feeding by flower Thrips causes scars & blemishes on leaves and pods

• Heavy feeding causes flower abortion and malformation. The pods become scarred (rough silvery surface) and malformed- not marketable

Control:

Foliar spraying using recommended chemicals starting at 2 leaf stage and during flowering are recommended:

– Spinosad (Tracer 480 SC®)

– Alpha-cypermethrin (ALPHAGUARD 10EC®, ALPHA-

KING 10EC®, FASTAC 10EC®)

– Teflubenzuron (NOMOLT 150SC®)

– Imidacloprid (CONFIDOR 70WG®

Spider Mites

Symptoms

Leaves stippled with yellow; leaves may appear bronzed; webbing covering leaves; mites may be visible as tiny moving dots on the webs or underside of leaves, best viewed using a hand lens; usually not spotted until there are visible symptoms on the plant; leaves turn yellow and may drop from plant.

Damage:

• Infested leaves turn silvery and brownish in

colour

• The leaves have cobwebs on the lower leaf

surface

Comments

Spider mites thrive in dusty conditions; water-stressed plants are more susceptible to attack.

Management

In the home garden, spraying plants with a strong jet of water can help reduce buildup of spider mite populations; if mites become problematic apply insecticidal soap to plants

Chemical Control:

• Weed control to remove alternative hosts

• In severe infestation, burn the bean straw

• Foliar sprays with recommended chemicals e.g. – Amitraz (Mitac®), – Abamectin (Dynamec®), – Spiromesifen (Oberon®)

Bean Fly (Ophiomyia spp.):

The bean fly larvae tunnel into stems and pods, causing galls and reduced pod development. Infested pods can be deformed and unmarketable.

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Identification:

• Adult is small (3 mm long) and shiny black with 2 clear wings

• Adults rest on leaves where it lays eggs

• The larvae/maggots are cream with dark mouthparts and reach 3 mm in length

• Pupae are small, brown and cylindrical with rounded ends

Damage:

• Affected plants are yellow, stunted and stems

are cracked at the soil level

• The damage is caused by the larvae which mine the stem and feed on the cotyledons of

Seedlings before or after emergence.

Control:

• Seed treatment e.g. using Gaucho or Apron Star

• Chemical sprays with recommended chemicals e.g.:

– Cypermethrin (RIPCORD 5%EC®) at 100 ml/20L at 2 weeks intervals

– Lambda Cyhalothrin (Karate 2.5WG®) and Deltamethrin (Decis 2.5EC®) to be applied from the flowering stage and through the harvesting period at weekly intervals

5.2.6 African Bollworm

Identification:

• Adult moth is dull yellow to brown with dark speck grayish wavy lines

• The female moth lays tiny round & brownish eggs near or on leaves, flowers or small fruits

• Larvae have alternating light and dark colored stripes on either side of the body and also have

a black head

• Fully grown caterpillars (3 – 4 cm long) drop from the plant and burrow into the soil to pupate

• The pupa is shinny brown

Damage:

• Attack on flower buds causes flower abortion

• Larvae bore clean circular holes on pods

• Feeding holes made by the larvae serve as entry point for pathogens which may lead to

Secondary infection

Control:

• Early detection of caterpillars is important

• Surrounding field should be weed free

• Planting of trap crops (Maize & Cucumber etc.) which attract the pest before it attacks

• Use of selective pesticides, such as microbial control agents Bacillus thuringiensis (BIO-T-PLUS ®, BIOKIL WP®), Azadirachtin (Neemraj Super 3000®)

5.2.7. Cut Worms

Identification:

• These are larvae of moths

• They are also referred to as root maggots

• Root maggots are white, chubby grub-like larvae that reach 1/3 inches in length at maturity

• Adult moths lay eggs at the base of plants, where the larvae feed after hatching

• The moths are active at night and hide during the day

Damage:

• They cut stems of young plants above or below soil level and also feed on plant foliage

• The affected young plants wither and fall off

Chemical Control:

• Soil treatment

• Foliar sprays using recommended chemicals e.g. Deltamethrin (ATOM 2.5EC®, DECIS 2.5EC®)

5.3. Common Diseases Affecting French Beans

Bacterial Blight (Xanthomonas campestrissyn. Xanthomonas axonopodis)

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Symptoms

Water-soaked spots on leaves which enlarge and become necrotic; spots may be surrounded by a zone of yellow discoloration; lesions coalesce and give plant a burned appearance; leaves that die remain attached to plant; circular, sunken, red-brown lesion may be present on pods; pod lesions may ooze during humid conditions.

Cause

Bacterium

Comments

Disease can be introduced by contaminated seed; bacteria overwinters in crop debris; disease emergence favored by warm temperatures; spread is greatest during humid, wet weather conditions.

Management

Plant only certified seed; plant resistant varieties; treat seeds with an appropriate antibiotic prior to planting to kill off bacteria; spray plants with an appropriate protective copper-based fungicide before appearance of symptoms.

1.1.2. Bacterial Brown spot (Pseudomonas syringae)

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Symptoms

Small, dark brown necrotic spots on leaves which may be surrounded by a zone of yellow tissue; water-soaked spots on pods which turn brown and necrotic; pods may twist and distort in area of infection.

Cause

Bacterium

Comments

Bacterium overwinters in crop residue; disease more severe when foliage is wet for extended periods.

Management

Plant only certified seed; rotate crops regularly; remove crop debris from field after harvest.

Halo Blight – (Pseudomonas savastanoi pv. Phaseolicola)

Symptoms

Small water-soaked spots on underside of leaves which turn necrotic and become visible on upper surface; lesions may develop an area of chlorotic tissue around the spots; lesions on expanding leaves may cause distorted leaves; red-brown lesions may be visible on pods; pod lesions may ooze or may turn tan in color.

Cause

Bacterium

Comments

Bacterium survives in seeds and crop debris and enters plants through natural openings such as stomata and is spread by splashing water and soil movement.

Management

Plant disease free seed or treat seed with an antibiotic to reduce levels of bacterium; rotate crops to non-hosts every 2 years; plow bean debris deeply in soil after harvest.

5.3.4. Alternaria Leaf Spot, Alternaria alternata

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Symptoms

Small irregular brown lesions on leaves which expand and turn gray-brown or dark brown with concentric zones; older areas of lesions may dry out and drop from leaves causing shot hole; lesions coalesce to form large necrotic patches

Cause

Fungus

Comments

Disease emergence favored by high humidity and warm temperatures; plants grown in nitrogen and potassium deficient soils are more susceptible

Management

Plant beans in fertile soil; foliar fungicide application may be required

Anthracnose (Colletotrichum spp.):

Anthracnose affects leaves, stems, and pods, causing dark lesions with distinct margins. It can lead to reduced yield and poor pod quality.

Symptoms

Small, dark brown to black lesions on cotyledons; oval or eye-shaped lesions on stems which turn sunken and brown with purple to red margins; stems may break if cankers weaken stem; pods drying and shrinking above areas of visible symptoms; reddish brown spots on pods which become circular and sunken with rust colored margin.

Cause

Fungus

Comments

Disease transmitted through infected seed; fungus can survive in crop debris in soil and reinfect crop the following season.

Management

Plant resistant varieties; use certified disease-free seed; avoid sprinkler irrigation, water plants at base; plow bean crop debris into soil.

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Bean Rust (Uromyces appendiculatus)

Rust appears as orange-brown pustules on leaves, leading to reduced photosynthesis and stunted plant growth. Severe infestations can cause defoliation.

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Symptoms

Initially the symptoms appear as small yellow/white spots on leaves. Later the spots become enlarged and shows raised brick red rust pustules (uredinia). Normally this pustules are surrounded by a yellow halo. Premature leaf drop may occur if the disease is severe.

Cause

Fungus

Comments

Spores (urediniospores) spread from one field to another by air. The black teliospores formed at the end of the crop season overwinter in the field and act as inoculum for next season crops.

Management

Grow available resistant varieties. Remove and destroy the infected crop debris. Follow crop rotation. Keep the field free from weeds. If the disease is severe, spray suitable fungicide.

Chemical Control:

- Use of crop rotation

• Destroy infected crop residues

• Regularly inspect fields

• Spray fungicides before flower formation

– Azoxystrobin + Difenoconazole (AMISTAR TOP 325SC®, AZOXY TOP 325 SC®)

– Azoxystrobin (AMITIV 250SC®)

– Mancozeb (BIOTHANE 80WP®, DITHANE DG®)

– Copper hydroxide (CHAMPFLO SL®)

– Cupric hydroxide (CHAMPION 50 WP®)

– Copper Oxychloride (CUPROCAFFARO Micro 37.5WG®)

– Chlorothalonil (DACONIL 720SC®, BRAVO 720 SC®)

– Sulphur (DEVISULPHUR WP®)

1.1.1.

Black Root Rot

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Symptoms

Elongated red-purple lesions on root tissue which turns dark gray to black; lesions coalesce to form large dark areas on roots and stems; deep lesions can cause stunted growth, wilting leaves, defoliation and plant death.

Cause

Fungus

Comments

Fungus survive in plant debris in soil.

Management

Rotate crops with non-susceptible grasses; avoid excess irrigation or drought stress.

1.1.2. Fusarium Root Rot

Source: Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Symptoms

Young plants stunted with chlorotic leaves; older plants with chlorotic leaves and some leaf drop; severely decayed roots which are hollow and dry.

Cause

Fungus

Comments

Fungus can survive in soil for several years.

Management

- Practice long term crop rotation since the fungi is soil borne, avoid over or under watering plants; some bean varieties exhibit some tolerance,
- Sanitation in the fields
- Remove and burn diseased crop residues

• Plant crop on well-drained soil

• Use certified seeds

Chemical Control:

• Spray Carbendazim (BENDAZIM 500SC®, RODAZIM SC®

White mold (Sclerotinia timber rot) sclerotnia sclerotum

Source: Plant Village, https://plantvillage.psu.edu/topics/bean/infos

Symptoms

Flowers covered in white, cottony fungal growth; small, circular, dark green, water-soaked lesions on pods leaves and branches which enlarge and become slimy; cottony white growth may be visible on lesions during periods of high humidity; death of branches and/or entire plant.

Cause

Fungus

Comments

Fungus can survive in soil for in excess of 5 years; disease can be spread by wind, contaminated irrigation water and by infected seeds.

Management

There is no true immunity to white mold in any bean varieties; rotate crops with non-hosts like cereals and corn; plant rows parallel to direction of prevailing winds to prevent spread of disease from secondary hosts nearby; avoid excessive nitrogen fertilizer; use a wide row spacing.

Powdery Mildew (Erysiphe spp.):

General Information:

- The disease is caused by a fungus Erysiphe polygoni.

Symptoms

- Powdery mildew appears as white powdery spots on the upper surface of leaves. It also appears on stems and pods. It can lead to reduced photosynthesis, decreased yield, and poor pod quality.

• The tissue beneath the affected plant becomes reddish brown

• The leaves eventually turn yellow and fall off

Control:

• Plough down crop residues from diseased plants after harvest

• Crop rotation

• Weed control

• Use of fungicides e.g.) Sulphur (Cosavet DF®), Hexaconazole (COTAF 5% EC®)

Downy Mildew (Peronospora spp.):

Symptoms

- Downy mildew causes yellowing of leaves on the lower surface and a purplish growth on the lower surface. It can result in defoliation and reduced yield.

Control:

• Plough down crop residues from diseased plants after harvest

• Crop rotation

• Weed control

• Use of fungicides e.g.) Sulphur (Cosavet DF®), Hexaconazole (COTAF 5% EC®)

Chapter 6: Export Vegetables Value Addition

6.1 Harvesting

- Harvesting of the pods commences 6 to 8 weeks after planting and continues for 1.5 – 2 months.
- French beans are harvested before the pods are fully grown and on a regular interval to meet the export quality.
- They should be harvested early in the morning when it is cool since the pod temperature is low
- Fine and extra-fine beans are handpicked carefully before seed visibility develops and to the length specified by the customers (i.e. retail markets).
- Once picked, the beans should be collected in crates, protected from the sun and taken to field shade or placed in cold storage as soon as possible.
- They should be placed in containers, covered with moist clean cloths (preferably white cotton) to maintain low temperatures.
- The pods should be taken to the grading shed (or put under shade) and sorted out to remove broken, malformed, overgrown, off-types and insect damaged pods. This is critical as freshness and quality depend on pre-cooling and sustained cool temperatures. The maximum allowable period between picking and packing ready of shipping of beans is 12 hours; the beans are delivered to the market in Europe within 24 hours from picking, maintaining a cold chain temperature range of 6°C to 8°C for shelf life of up to seven days.

6.2 Post-harvest handling

6.2.1 Grading

French beans intended for marketing should meet the following minimum quality requirements:

- Beans should be intact, sound, of fresh appearance, clean and free from excess external moisture
- Beans should be of specified size and of such a state as to enable produce to with stand transport and handling so as to meet market requirements at the destination.
- Extra fine pods should be very tender, turgid, seedless, with no strings, and free from any defects. The width of the pods (maximum diameter) should be less than 6 mm and the minimum length of 10cm.
- The fine pods may have small seeds and be short with soft strings, be turgid and tender. The width of the pods should be between 6-9 mm while the length of 12-14 cm is recommended.
- Bobby beans comprise beans of marketable quality which do not qualify for inclusion in the higher classes but satisfy the minimum requirements specified above. Beans should be reasonably tender and seeds should not be too large.
- N/B: In all grades, the pods should have the characteristic size and colour of its variety.

6.2.2 Packaging, Pre-cooling and Transportation

- The pods are packaged in corrugated fiberboard cartons of 3 kg gross weight or in plastic pre-packs weighing 250,500 or 1,000gm.
- The pods are pre-cooled to remove field heat. This is done at 7-80C (using forced air coolers). The beans can be stored at 7 to 80C and a relative humidity of 95-100% for up
- The cartons should be carefully stacked during transportation to reduce movement of cartons and allow free movement of air. Insulated or refrigerated vehicles should be used for transportation of French beans.

Chapter 7: Green Technologies and Mechanization

7.1 Fertilizer

Use of DAP (Diammonium Phosphate) or other phosphatic fertilizes to help with root development. Farm yard manure can be used especially in soils low in organic matter. Avoid using too much Nitrogen which can promote vegetative growth at the expense of pod production.

7.1.2 Irrigation

Pre -irrigate the field to field capacity before planting. After the seedlings emerge, water lightly to help them push through the soil. After about two weeks, withhold irrigation to help the plants root well. Avoid overwatering, which can encourage diseases.

7.1.3 Planting

Plant seeds 25mm deep in moist soil. When planting multiple rows, Plant upwind so that older plantings are downwind of new ones. This can help reduce pests and diseases.

7.1.4 Harvesting

Harvest young pods regularly to encourage continued flowering and yield.

7.1.5- Cooling

Use hydro cooling or pressure cooling to quickly remove heat from the field

7.1.6 Transportation

Transport fresh fresh market crops quickly to maintain quality.

Chapter 8: Export Vegetables Business and Marketing

- With continued demand for the French beans being recognized, export companies are going into contract farming with farmers. This involves setting of fixed prices that run throughout the year whether the season is low or high.
- Due to high labour requirements it is recommended that it is grown on a small scale, possibly with staggered planting so that a manageable proportion of the crop is ready for picking at any one time and that harvesting is continuous. For instance, the land may be divided into convenient sized plots (i.e. ¼ acre plots) and planted at 2-3 weeks intervals.
- Growing these beans requires a lot of dedication and capital especially for the high season. The most sensitive stages in production include; germination, flowering, fruiting and harvesting.
- French bean is a high value horticultural crop as indicated in the Gross Margin Analysis (Annex 1)

Chapter 9: Gender equality, human rights and social inclusion

9.1 Background

Studies conducted during implementation of the various value chains identified gender and human rights related challenges to participation. Women reported that cultural issues affected their rights to own land preventing their involvement in value chain activities as they could not make decisions on what to plant since all agricultural activities are dependent on land as a factor of production.

Gender roles, triple roles for women -Reproductive. Productive and community management for women while Men's role is productive and community politics were also sited as a hindrance to women's involvement in value chains.

Cultural practices like wife cleansing and inheritance, especially in some counties, denied widows an opportunity to participate in the value chain activities. Decision making at the household level relating to value chain selection were mostly done by men, though in some instances, women also participated in the process. But where men had migrated to towns, women were the sole decision makers on selection of value chain(s).in some counties, men dominated in decision making concerning value addition, grading, marketing, savings, access to agricultural and marketing information, as well as access to credit and training. Women and youth could not initiate any agriculture-based Income Generating Activities (IGAs) without permission from the husbands/fathers or the elderly men in the family due to cultural beliefs and patriarchy.

High illiteracy levels and low skills especially among women left them vulnerable in terms of technical matters in the value chain activities. Several farmer groups believed both English and Kiswahili languages be adopted during training, Trainers were said to use a lot of English when training and it confused the farmers making language and methodologies used a barrier.

Lack of markets: Exploitation by intermediaries affected the prices of most of the value chain produce. It was suggested that market linkages with potential external buyers be established and strengthened.

Gender and extension services - Extension services were provided to the farmers through group training and through telephone calls by private extension officers and county government extension officers. The youth indicated that the extension training courses were done early during the day when they had reported for other activities such as attending other fishponds, harvesting excluding them from the services. Women also complained that the time at which the extension trainings are done did not favour them as they are attending to domestic chores or farm activities denying them the opportunity to gain experience.

Youth attributed their inadequate participation in value chain production activities to lack of land ownership since the parents (fathers) were not willing to give them land on a permanent basis. As a result, there was serious conflict between the young men and their fathers in counties in some counties. The fathers felt that the sons (youth) were irresponsible people who would sell the land upon being given, and the money spent on drinking alcohol. This would render the entire family landless.

Widowhood – Women in all the sampled counties were targeted because of their status as widows, and the fight for family land and other capital assets always starts immediately after the husband died. Being a widow left them vulnerable to other families or even community members who want their land and other assets. In some cases, family members secretly alter particulars of ownership documents such as title deeds to the disadvantage of widowed women.

People with disabilities often experience discrimination in their everyday life. Discrimination describes a situation where an individual is disadvantaged in some way because of a 'protected characteristic.' Discrimination takes place in different forms. It can be direct or indirect, manifest in the form of harassment, or there can be direct instructions to discriminate. Direct discrimination is based on

negative attitudes, prejudice, and/or on discriminatory legislation. Indirect discrimination, for example, can be caused by physical barriers, such as stairs as the only means to get to vital locations, or using media. For example, people who are visually impaired or have difficulties hearing cannot use media without assistance.

Most of the respondents requested special training on gender mainstreaming and gender-based violence and human rights, hence this manual. The findings came from the report below and gender analysis of selected value chains conducted by the Gender Youth and Social Inclusion Advisor, MESPT in August 2024 (G.V. Masinde and C.K. Wambu, PhD November, 2021Final draft report A Gender Equality and Human Rights Approach for The Green Employment in Agriculture Programme (GEAP), MESPT)

9.1.1 Definition and key concepts

Sex: It identifies the biological differences between men and women. Kenya recognized and counted intersex persons during the census in 2019.

Intersex: Intersexuality is an overarching term that refers to human bodies that fall outside the strict male and female binary. The term refers to the many variations—often present at birth—that can affect a person's reproductive or sexual anatomy, which may involve genitalia, hormones, reproductive organs, and chromosomes.

For example, these variations might include being born with "female" anatomy on the outside, such as a vaginal opening, but having "male" sexual organs on the inside.-

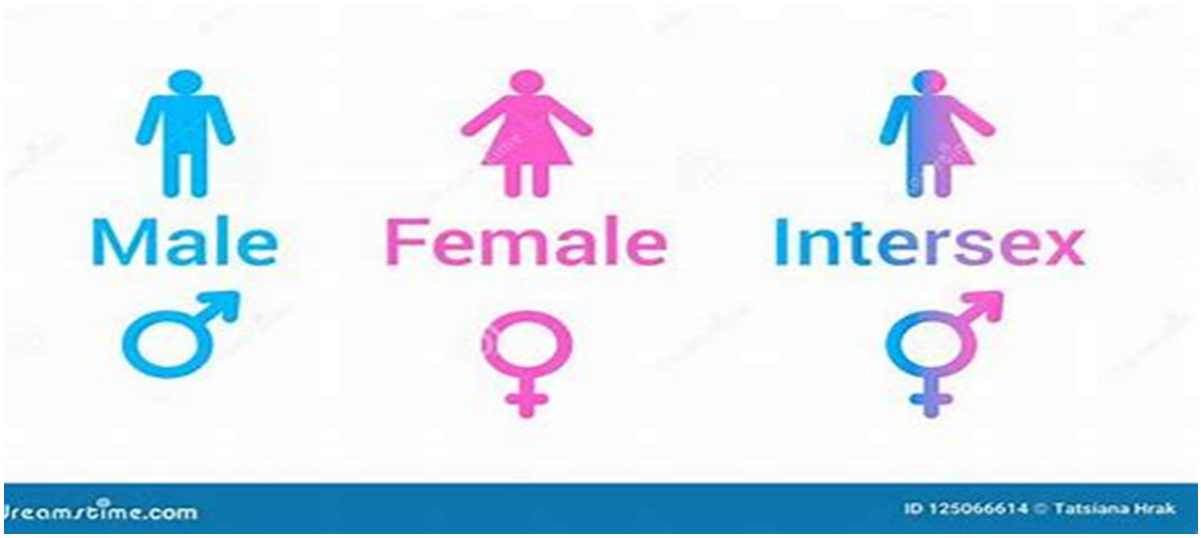


Figure 1: Kenya recognizes three genders

Gender : Refers to the socio-cultural differences and relations between men and women that are learned, changeable over time, and have wide variations both within and between societies and cultures. The concept of gender also includes expectations held about the characteristics, attitudes and behavior of women and men (femininity and masculinity).

Gender equality: This is a human right that is enshrined in several declarations and conventions, including the legally binding Convention on the Elimination of All Forms of Discrimination against Women (CEDAW).

Intersex: What It Means, How It's Identified accessed on 14/11/2024

Two genders? No, we should recognize the three in Kenya | Nation accessed on 14/11/2024.

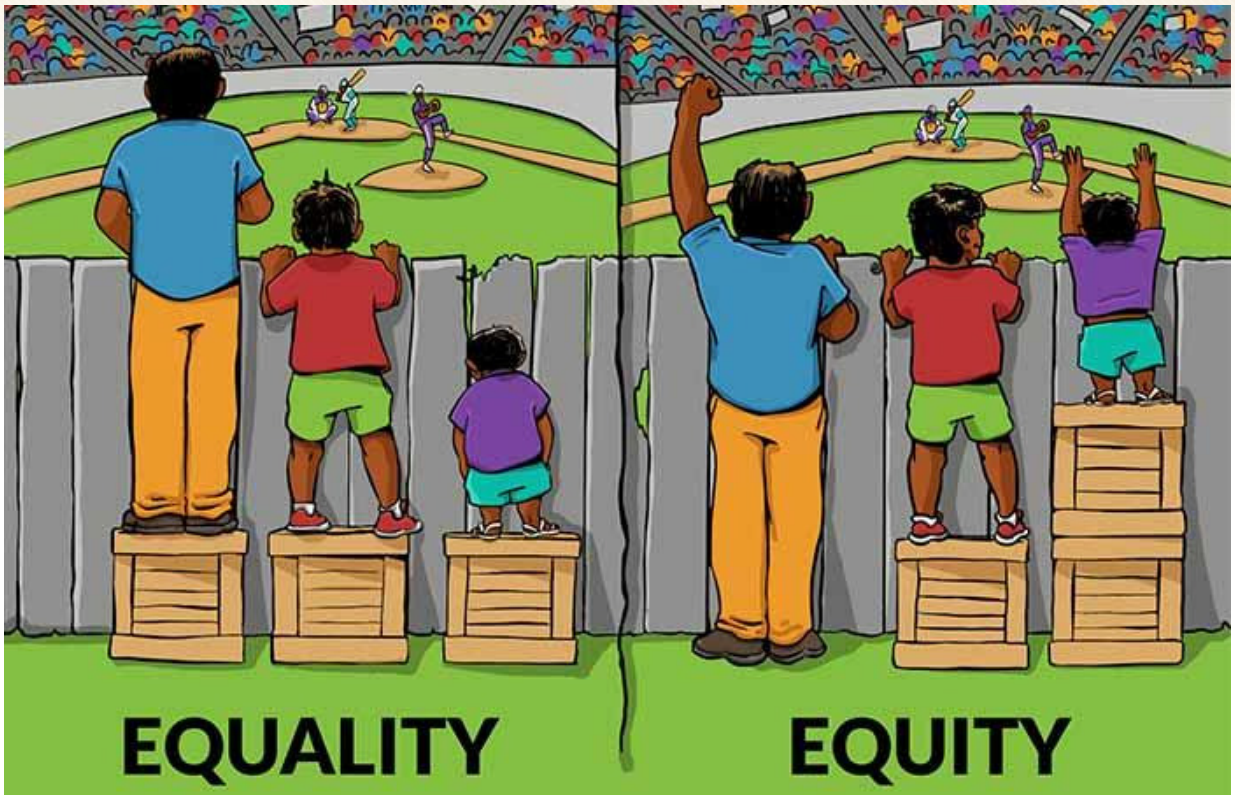


Figure 2: Equality and Equity illustrated

Equality does not mean that women and men are the same but that women's and men's rights, responsibilities and opportunities should not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of diverse groups of women and men(UN General Assembly, 1979). The centrality of gender equality to development is its establishment as a goal (goal 5) of the Sustainable Development Goals (SDGs) and included as a target in other SDGs.

Gender Equity: This is about fairness and being sensitive to the peculiarities of individuals, socio-economic groups, or communities. It is about equality of outcome or result of an intervention. Gender equity involves considering the different social, cultural, and economic situations of women, men, girls, and boys right from the design of an intervention through implementation to monitoring and evaluation.

Gender sensitivity: The ability to recognize the differences in terms of roles, contributions, needs and experiences of both women and men, and create a conducive environment for effective application of their specific knowledge, skills, and experiences in meeting their prioritized needs.

All You Need To Know About Gender Equity Accessed on 14/11/2024

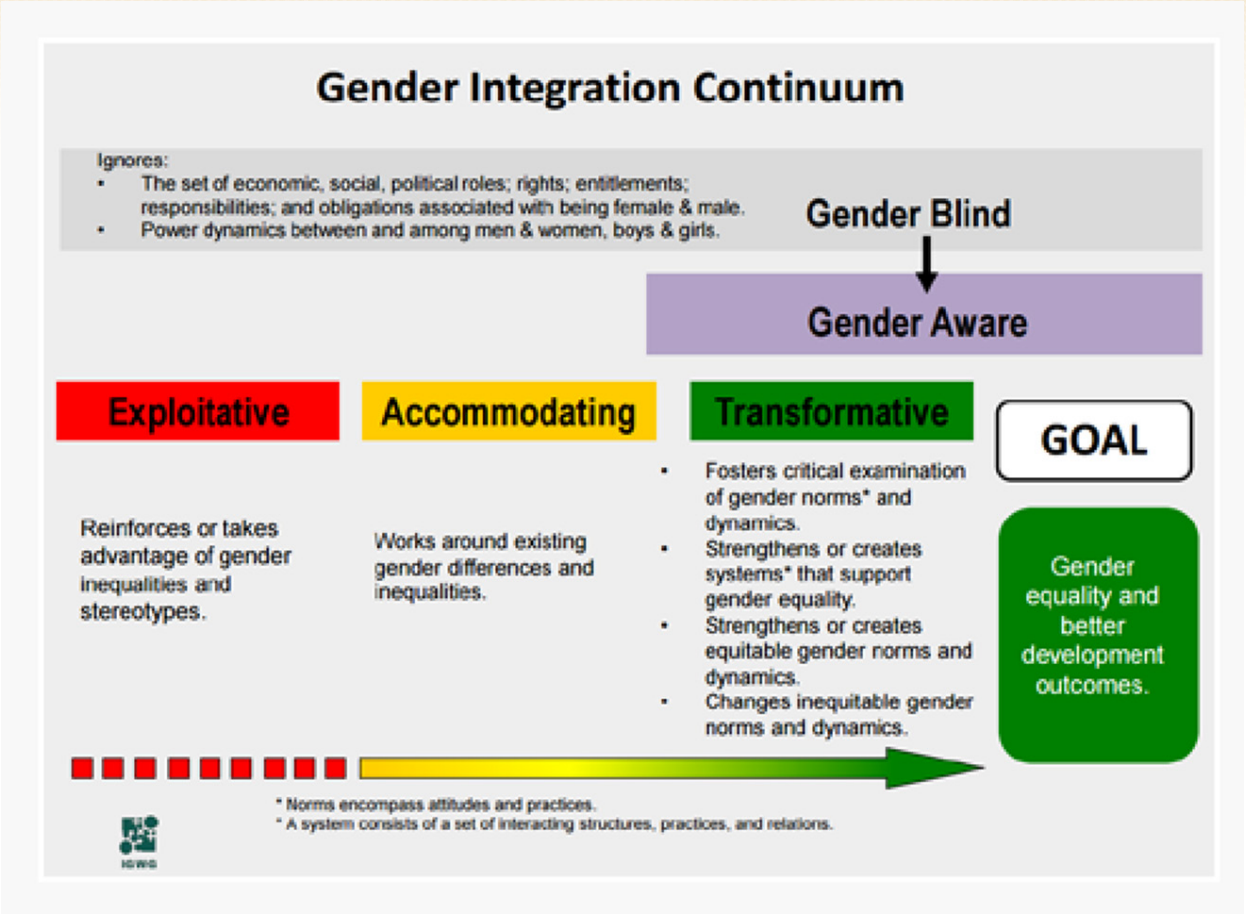


Figure 3: Gender Integration Continuum

Gender aware: Recognizing or being aware of the existence of gender and gender differences in society; recognizing that men and women are positioned differently; that they have different experiences, different needs and interests, different strengths, and skills, and that these need to be considered while planning for any intervention.

Gender responsiveness: This describes the policies, programmes and projects that focus on transforming existing gender disparities to create a more balanced relationship between women and men in terms of power and decision-making as well as access to and control over productive resources. Gender responsiveness is key in meeting strategic gender needs (strategic gender needs are the needs women identify because of their subordinate position in society. These needs are long-term and relate to the empowerment of women. Strategic gender needs for women might include land rights, more decision-making power, equal pay, and greater access to credit. Addressing these needs allows people to have control over their lives beyond socially defined restrictive roles)

Practical gender needs are defined as: Needs that respond to immediate necessities such as adequate living conditions, water provision, health care, and employment. Gender-specific needs that do not challenge gender roles, such as access to healthcare, water availability, and employment opportunities.

Gender transformative

Addressing gender imbalances, changing gendered power relations, and actively building equitable social norms and structures. An organization is aware that women and men do not have equal opportunities in the household, at community level or at work. They may, for example, create equal working conditions for women and men, recognizing that special means may be required to increase the number of women in management positions or to achieve an environment free from gender-based violence (GBV). Gender transformative approaches are characterized by explicitly centering gender norms and are thus common for interventions that have the primary goal of addressing gender issues and transforming gender relations to promote equality.

About IGWG | IGWG accessed on 14/11/2024

Transformative Gender Programming includes policies and programs that seek to transform gender relations to promote equality and achieve program objectives. This approach attempts to promote gender equality by:

1. fostering critical examination of inequalities and gender roles, norms, and dynamics,
2. recognizing and strengthening positive norms that support equality and an enabling environment,
3. Promoting the relative position of women, girls, and marginalized groups, and transforming the underlying social structures, policies and broadly held social norms that perpetuate gender inequalities.
4. Most importantly, program/policy planners and managers should follow two gender integration principles:
   - First, under no circumstances should programs/policies adopt an exploitative approach since one of the fundamental principles of development is to "do no harm."
   - Second, the overall objective of gender integration is to move toward gender transformative programs/policies, thus gradually challenging existing gender inequities and promoting positive changes in gender roles, norms, and power dynamics.

Empowerment: Is about improving women's and men's status to enhance their decision making-capacity at all levels. It refers to the process in which women and men reflect upon their reality and question the reasons for their situation in society. It includes developing alternative options and taking opportunities to address existing inequalities. It enables them to live their lives to the fullest of their capabilities and their own choices in respect of their rights as human beings.

Gender Mainstreaming: Gender equality can be achieved by a strategy of mainstreaming which is defined by the United Nations, as '…the process of assessing the implications for women and men of any planned action, including legislation, policies, or programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic, and societal spheres so that women and men benefit equally, and inequality is not perpetuated. The goal is to achieve gender equality.'

Gender mainstreaming aims to ensure that women and men, particularly those who are disadvantaged, equally participate in and benefit from the activities of a given organization, and that all implemented projects and programmes consider women's and men's concerns and experiences as an integral dimension of their cycles. This intervention ensures that existing democratic relations are protected, at the same time preventing the further perpetuation of inequalities and the creation of new ones.

9.1.2 The Business case for gender mainstreaming

Gender mainstreaming in Agri-enterprises is not only a matter of social equity but also makes strong business sense. Here are some key points that highlight the business case for gender mainstreaming in this sector:

Increased Productivity: Women make up a sizable portion of the agricultural workforce. By providing them with equal access to resources such as land, credit, and training, productivity can be significantly increased. Studies have shown that closing the gender gap in agriculture could increase yields on women's farms by 20-30%

Enhanced Innovation: Diverse teams bring varied perspectives, leading to more innovative solutions.

Women often bring unique insights into agricultural practices and market needs, which can drive innovation and improve business outcomes.

Market Expansion: Women are key players in local markets and value chains. By empowering women, Agri-enterprises can tap into new markets and consumer bases, enhancing their market reach and profitability.

Improved Financial Performance: Companies that invest in gender equality tend to perform better financially. Gender-diverse companies are more likely to have higher returns on equity and better financial performance overall.

Risk Mitigation: Gender mainstreaming can help mitigate risks associated with labor shortages and community relations. Empowering women can lead to more stable and resilient communities, which in turn supports sustainable business operations.

Compliance and Reputation: Increasingly, investors and consumers are looking for companies that adhere to social responsibility standards. Gender mainstreaming can enhance a company's reputation and compliance with international standards, attracting more investment and customer loyalty.

By integrating gender mainstreaming into their operations, Agri-enterprises can not only contribute to social equity but also enhance their competitiveness and sustainability.

9.1.3 Steps to mainstream Gender

Gender mainstreaming in Agri-enterprises involves several strategic steps to ensure that gender considerations are integrated into all aspects of the business. Here are some specific strategies:

1. Conduct Gender Analysis: Start with a thorough gender analysis to understand the distinct roles, needs, and challenges faced by men and women in the agricultural sector. This analysis should inform all stages of project planning and implementation.

2. Develop Gender-Responsive Policies: Create policies that promote gender equality and address specific barriers faced by women and youth. This includes policies on equal access to resources, decision-making, and opportunities for training and development.

3. Capacity Building: Provide training and capacity-building programs for both men and women to enhance their skills and knowledge. This can include technical training, leadership development, and financial literacy.

4. Gender-Responsive Budgeting: Allocate budget specifically for gender mainstreaming activities. This ensures that there are sufficient resources to support gender equality initiatives.

5. Participatory Planning: Involve both men and women in the planning and decision-making processes. This ensures that the perspectives and needs of both genders are considered and addressed.

6. Monitoring and Evaluation: Establish gender-sensitive indicators and regularly monitor and evaluate the impact of gender mainstreaming activities. This helps in assessing progress and making necessary adjustments.

7. Promote Women's Leadership: Encourage and support women to take on leadership roles within the enterprise. This can be achieved through mentorship programs, leadership training, and creating an enabling environment for women leaders.

8. Address Social Norms: Work on changing discriminatory social norms and practices that hinder gender equality. This can be done through community

engagement, gender transformative approaches including Gender action learning systems (GALS), community conversations, model families, among others that seek to address root causes of discrimination.

9.2 HUMAN RIGHTS

Human Rights: These are rights inherent to all human beings, independent of nationality, place of residence, sex, national or ethnic origin, race, religion, language, or any other status. All human beings are equally entitled to human rights without discrimination. These include the right to life, equality before the law, the right to work, social security, education, and the right to development. These rights are all interrelated, interdependent and indivisible

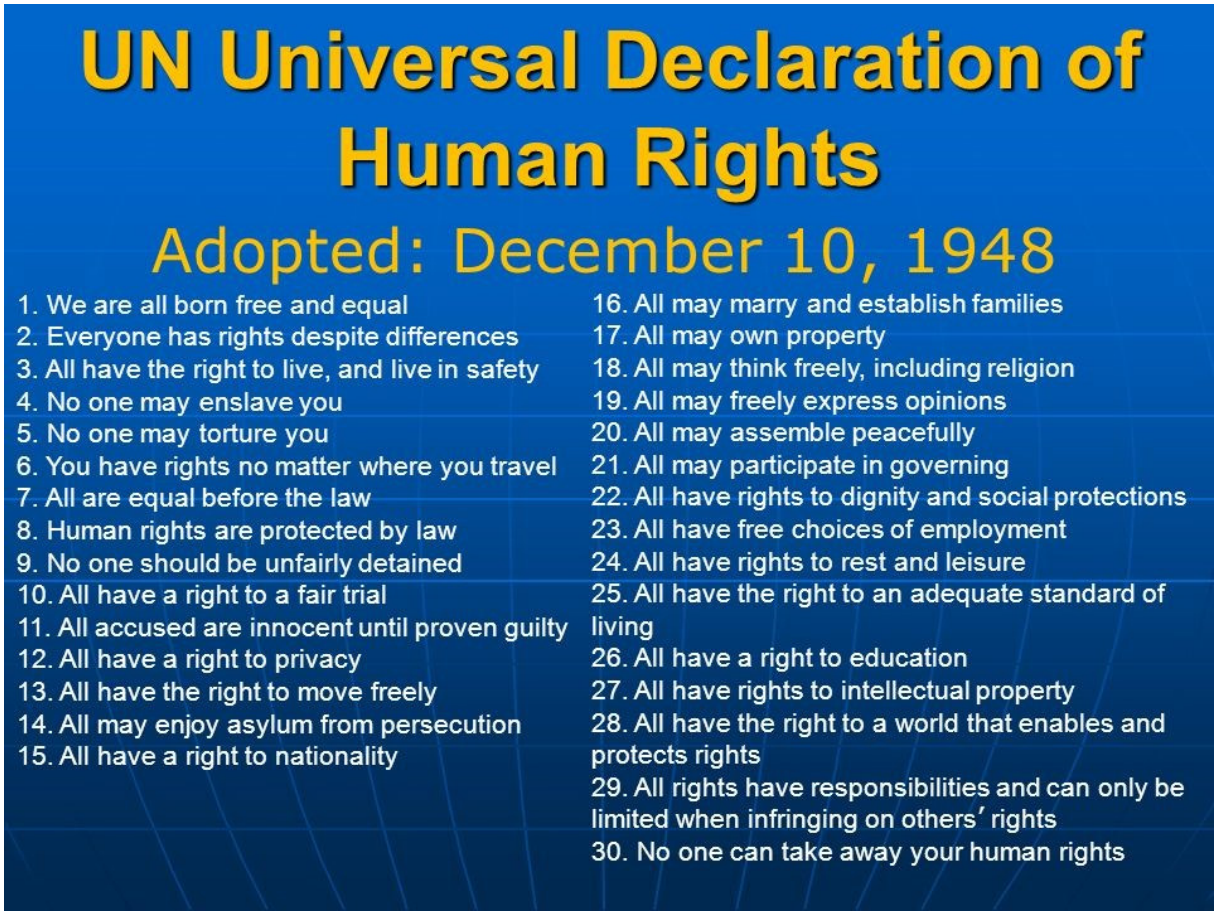


Figure 4: 30 articles of Huma rights

Children rights are also enshrined in the convention on the rights of the child(1989). Kenya enacted this into a children's act 2022.

(Access the comprehensive text here 30 articles on the 30 Articles of the Universal Declaration of Human Rights | OHCHR

https://rvalibrary.org/shelf-respect/law-library/national-human-rights-month/ Accessed on 14/11/2024

A human rights-based approach (HRBA): This is a conceptual framework based on international human rights standards and directed towards promoting and protecting human rights. HRBA seeks to analyze the inequalities which lie at the heart of development problems and redress discriminatory practices and unjust distributions of power that impede development progress.

HRBA is concerned with empowering people to know and claim their rights and increasing the ability and accountability of individuals and institutions who are responsible for respecting, protecting, and fulfilling rights. The HRBA approach aims to eliminate or at least diminish the impediments of existing exclusion and discrimination within the implementation of any programme or project. HRBA gives equal attention to both achieving development goals and to the processes that are chosen to achieve these goals. So, within HRBA, the processes that enable the participation and inclusion of all stakeholders are important.

convention-rights-child-text-child-friendly-version.pdf accessed on 13/11/2024.

Access the full text here file

9.2.1 ABOUT HRBA AND PANT PRINCIPLES

The HRBA builds on the norms and principles outlined in the Universal Declaration of Human Rights, and the subsequent legally binding UN treaties, which form the basis for all development cooperation. Application of the HRBA contributes to effective development cooperation processes and sustainable development outcomes. It challenges unequal power relations and social exclusion that deny people their human rights and often keep them in poverty and oppression. Microenterprise support Programme Trust (MESPT) is committed to the HRBA in all interventions.

HRBA places people living in poverty and oppression (rights holders) at the center. It is about:

- Empowering rights-holders to enable them to take action to address their situation and to claim their rights individually and collectively.
- Developing capacities and interests of duty-bearers to fulfil their obligations to respect, protect and fulfil human rights.

PANT is a tool that guides staff on the practical application of the HRBA.

It has four elements:

Participation : Do all stakeholders engage actively, in a way which allows rights-holders to contribute meaningfully and influence processes and outcomes?

Everyone has a right to freely participate in decision making that affects them and their environment. People of power have an obligation to offer meaningful participation and consultations to people affected. Everyone has the right to organize and hold opinions without any interference, and to seek, receive and impart information and ideas through any media regardless of frontiers. Promoting participation is essential for the outcome of projects and programmes. It is stated in international treaties that women, men, girls, and boys have a right to participate in decision-making that affects them. Social and cultural roles that are prescribed women and men have impact on their possibilities of choices, economic independence and access to natural resources, access to land tenure, access to clean and safe water, and decisiveness on housing, education, and livelihood.

Guiding questions are:

- Are fair and effective platforms for public-private dialogue in place, and do they give space to representatives of women and men with less power and status?
- Are measures taken to include and enhance the capacity of those with less knowledge and power so that they can participate meaningfully in the consultative processes? For example, do all stakeholders have sufficient and accessible information on the issues being addressed? Are they invited to truly participatory processes? Are barriers removed, e.g., no expensive travelling, not during busy seasons, not inaccessible for women or persons with disabilities?
- Are stakeholders actively engaged at all stages of the programming process?
- Do initiatives make space for vulnerable people to take actions of their own choosing to manage perceived risks? This is especially important in 'transformative' efforts that encourage profound changes in livelihood systems in response to climate change or market upheavals.

Accountability: Who are the duty bearers on various levels, and do they have sufficient capacity and interest to be accountable to rights holders?

The state has an obligation to respect, fulfil and protect the rights of its population. It entails a functional regulatory system for climate and environmental issues, labour law, land systems ; concrete

plans for disaster risk reduction and response; rule of law including a justice system providing legal aid to poor and marginalized people and their organisations; and functional and accessible complaints mechanisms. Emphasizing the accountability of all actors (both state and non-state), whose actions impact the environment and natural resources, is a central element of HRBA. Asserting human rights without supporting effective and precise frameworks to hold duty bearers accountable is of little practical use. Strengthening the governance of natural resource management and securing natural resources tenure while also taking rights of local people, women and men, ethnic minorities, nomadic or other marginalized groups into account, can

i. Minimize corruption.

ii. Have positive effects on conflict management.

iii. Be a key step towards alleviating tensions in society and consolidating peace in post-conflict societies.

Guiding questions are:

- Are the duty bearers and other actors with power identified?
- Does the initiative contribute to ensuring that public and private sector actors have systems in place to monitor and disclose social and environmental impacts according to national and international standards?
- Do monitoring and evaluation arrangements involve civil society organisations representing the concerned population?
- Are there consequences (legal, financial, or moral) for non-compliance with human rights objectives and principles?
- Has the contribution established accessible and effective mechanisms for redress and complaints?
- Does the contribution facilitate access to networks, organisations and other sources of information that may assist duty bearers to enhance their accountability and rights holders to claim their rights?

Non-discrimination:Are rights holders and the root causes of their lack of human rights identified and considered, particularly those most subjected to discrimination, marginalization, and vulnerability?

All women, men, girls, and boys are, without any discrimination, entitled to equal access to ecosystem services, market systems and natural resources as well as resilience for a standard of living adequate for their health and well-being. Discrimination may be expressed in law (explicit discrimination) and hence be part of official policy such as lack of land rights; or it may be found in practice and behavior (implicit discrimination)such as where a remote group cannot access water services because drinking wells provided by the state are too far away.

Key questions are:

- Are vulnerable groups specifically identified and targeted?
- Is there a proper analysis of the consequences of the contribution for these women, men, girls, and boys?
- Is there a plan for their inclusion and benefit including disaggregated data and indicators?
- Are tariffs and fees also adjusted to accommodate poor and marginalized groups?

- Are land and property rights addressed to ensure that women, minorities, and poor people are protected or compensated?
- Are the livelihoods supported resilient to risks related to climate and market volatility and uncertainty, and therefore relevant for vulnerable populations that cannot afford to shoulder uncertain risks?

Transparency: What measures are put in place to ensure that all stakeholders can access relevant information and knowledge regarding the contribution?

Transparency all people have the right to obtain information in an accessible and timely manner, e.g., about pollution levels, water quality, environmental health risks, exploitation plans, land use plans and disaster preparedness plans. Granting sufficient and accessible information to affected women and men in planning and policy making processes is of key importance to their ability to influence and monitor developments. It is also important to consider local traditions, survival strategies and indigenous people's dependence on natural resources, and ensuring that separate views are documented. It is also essential to consider access to natural resources for people living in poverty and that a long-term sustainable development can be promoted, to avoid future opposition and conflicts.

Guiding questions are:

- Are the plans and goals of the contribution made public and explicit in an accessible manner to all stakeholders concerned, including the most marginalized groups so that they understand benefits and risks?
- Will affected women, men, girls, and boys receive sufficient, timely and accessible information, including separate views on the plans, and will they be able to take meaningful part in and influence the process?
- Will access to information regarding the local risk situation be improved and will early warning systems be developed so that the ability of vulnerable groups to protect themselves and quickly recover after disasters is strengthened?
- Does the initiative contribute to capacities and commitments for greater transparency in policies and practice affecting land and natural resource tenure, particularly in new forms of land acquisitions and concessions?

9.3 SOCIAL INCLUSION

Social inclusion is the process of improving the terms on which individuals and groups take part in society—improving the ability, opportunity, and dignity of those disadvantaged based on their identity.

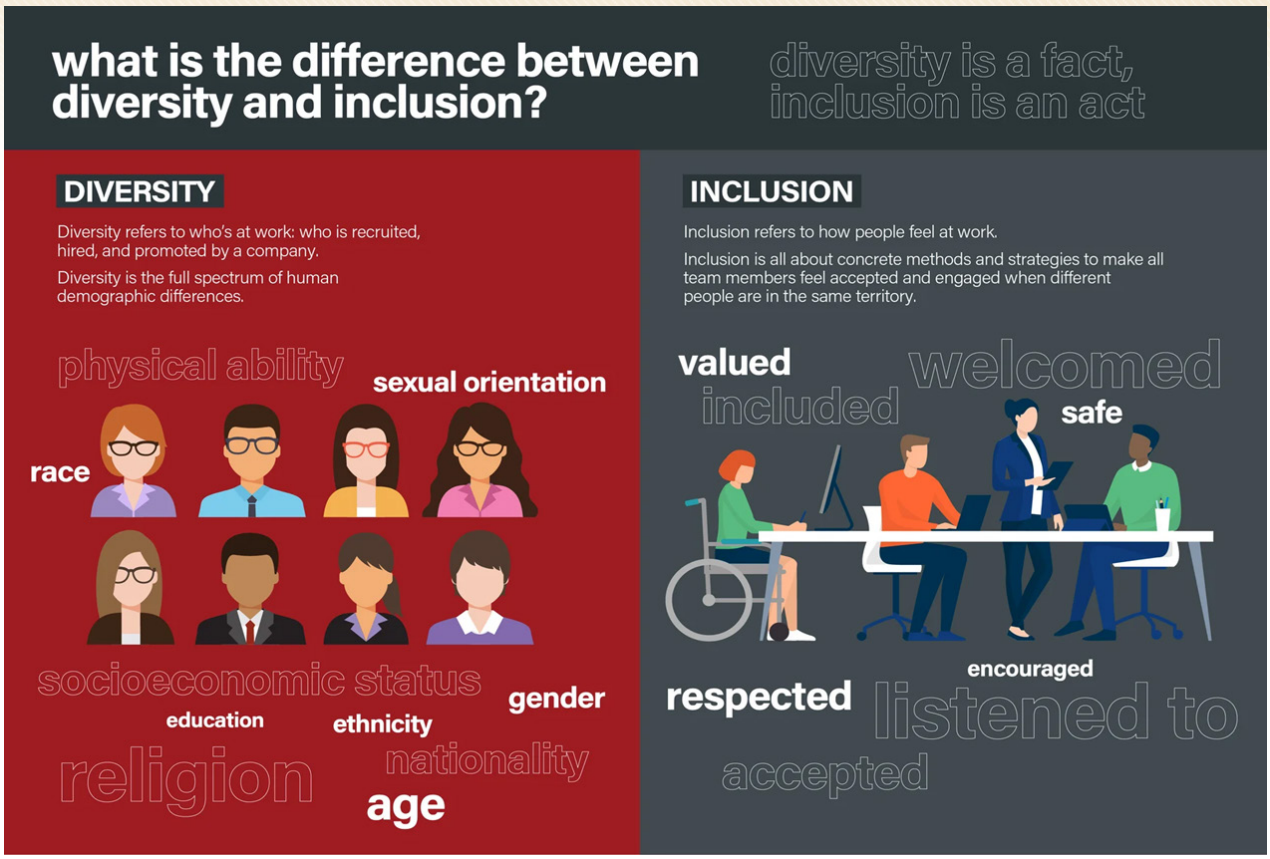


Figure 5 Diversity vs Inclusion DRP Group. (n.d.). What is the difference between diversity and inclusion? DRP Group. Retrieved November 14, 2024, from https://www.drpgroup.com/en/blog/what-is-the-difference-between-diversity-and-inclusion.

In every country, some groups confront barriers that prevent them from fully participating in political, economic, and social life. These groups may be excluded not only through legal systems, land, and labor markets, but also discriminatory or stigmatizing attitudes, beliefs, or perceptions. Disadvantages are often based on gender, age, location, occupation, race, ethnicity, religion, citizenship status, disability, and sexual orientation and gender identity (SOGI), among other factors. This kind of social exclusion robs individuals of dignity, security, and the opportunity to lead a better life. Unless the root causes of structural exclusion and discrimination are addressed, it will be challenging to support sustainable inclusive growth and rapid poverty reduction.

Social inclusion is the right thing to do, and it also makes good economic sense. Left unaddressed, the exclusion of disadvantaged groups can be costly. At the individual level, the most measured impacts include the loss of wages, lifetime earnings, poor education, and employment outcomes. Racism and discrimination also have physical and mental health costs. At the national level, the economic cost of social exclusion can be captured by foregone gross domestic product (GDP) and human capital wealth. Exclusion, or the perception of exclusion, may cause certain groups to opt out of markets, services, and spaces, with costs to both individuals and the economy.

Ensuring inclusivity means no one is left behind (leave no one behind-LNOB). The following steps make this possible.

9.3.1 Leave no one behind

STEP 1: Who is being left behind? Gather data.

Identify who is being left behind and in what ways, and who among them is the furthest behind.

- Gather and analyze all data and information on who in the community is left behind in group activities and project interventions-sub populations and geographic localities among others with due attention to the human rights-based approach and gender considerations.

- Include and analyze data and information from a range of sources, including from national statistical offices, national human rights institutions, international human rights mechanisms, ILO supervisory bodies, civil society organizations, particularly organizations of marginalized communities as well as women's organizations, and/or community-level data, citizen science initiatives and scientific journals.
- Seek feedback and input from diverse stakeholders, including groups and populations left behind, throughout the process, from initial gathering of data to review and analysis.
- Identify data gaps.
- Complement existing data where needed, to further understand which subpopulations may be left behind, and which ones are furthest behind, using participatory approaches to gathering data.
- Combine relevant national and UN development, human rights, conflict, inequalities, political, risk and humanitarian analysis for more joined up assessment of who is left behind and why – with a view to identifying the furthest behind.
- Triangulate the data from the above sources through a consultative analytical process to develop a mutual understanding across all interventions that consider the voices and experiences of communities together with other data sources.

STEP 2: Why? Prioritization and analysis

- Frame as problems the LNOB assessment's main findings are about the ways in which people are left behind. Identify the relevant human rights and international labour standards.
- Conduct a root cause analysis to identify why people are being left behind and to enable responses to the root and underlying causes of inequalities, including gender inequalities, vulnerability, deprivation, discrimination, displacement, and exclusion.
- Conduct a role pattern analysis.
- Conduct a capacity gap analysis.
- Questions to be asked at each step: Causal analysis WHY? Which rights are implicated that explain why there is a problem? Role pattern analysis WHO? Who is the duty-bearers? Who are the rights holders? Who must do something about it? Capacity gap analysis WHAT? What capacity gaps are preventing duty-bearers from fulfilling their duties? What capacity gaps are preventing rights holders from claiming their rights? What do they (each) need to act?

STEP 3: What? What should be done?

Identifying what should be done and by whom.

- Identify actions and interventions to address challenges, barriers, and capacity gaps. Areas include advocacy, enabling the environment, capacity development,community empowerment, quality and accessibility of services, partnerships including civil society.
- Prioritize, considering the commitment to address the furthest behind first.

STEP 4: How? How to measure and monitor progress

- Help identify and contextualize LNOB indicators and targets – having a clear overview

of data and data gaps and a plan for monitoring progress is an important precondition for effective follow-up and review.

Quantitative and qualitative indicators will be necessary – measuring commitments, processes, and outcomes.

- Support innovative ways of tracking, visualizing, and sharing information.
- Develop the stakeholder capacity to monitor inequalities, including gender inequality and discrimination, including that of governments (national, subnational) and communities.

STEP 5: Advancing accountability for LNOB.

- Ensure accountability for LNOB within the in the organization and the interventions.
- Support the integration of LNOB in interventions follow-up and review processes, including in narrative reports.
- Support national accountability to people left behind.

ANNEX I

MESPT
MICRO ENTERPRISES SUPPORT PROGRAMME TRUST

EXPORT VEGETABLE TRAINING WORKSHOP FOR XXXX

TRAINING VENUE: XXX **DATES: XXX**

SAMPLE PROGRAMME

Date and Time	Activity	Duration	Responsible

ANNEX 11: List of participants who validated this value chain manual

S/NO	NAME	INSTITUTION
1	Joseph Kairu	County Government of SIAYA
2	Winston Motanya	County Government of KISII
3	Nicholas Manyinsa	County Government of KISII
4	Cecilia Mutuku	County Government of MACHAKOS
5	Paul Busienei	County Government of NAKURU
6	David Kimera	Youth Agri-Preneur
7	Lawrence Swanya	County Government of MACHAKOS
8	Kenneth Kagai	County Government of TRANS-Nzoia
9	Benedict Khanyifu	County Government of TRANS-Nzoia
10	Mwalimu Menza	Kenya Agricultural and Livestock Research Organization
11	George Kamami	County Government of MAKUENI
12	Moses Munialo	County Government of BUGOMA
13	Agesa Eric	County Government of KAKAMEGA
14	Benard Mainga	County Government of KWALE
15	Jane M Kamamu	County Government of KILIFI
16	Teresia Ndungu	County Government of NYANDARUA
17	Wilbur Mutai	County Government of UASIN-GISHU
18	Stephen Odipo	Kenya Agricultural and Livestock Research Organization
19	Solomon Mbivya	PAPA FARMERS Limited
20	William Mwangi	County Government of MAKUENI
21	Doreen Kinoti	Micro-Enterprises Support Programme Trust
22	Serah Nzau	Micro-Enterprises Support Programme Trust
23	Margaret Kikuvi	Micro-Enterprises Support Programme Trust

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