



## AGRICULTURAL ECONOMIST

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Agriculture plays a crucial role in the South African economy, supplying food, fibre, fertilizers and fuel products for local and export markets. Agricultural economics involves studying these markets to optimise and advise the stakeholders in farming activities.

Agricultural economists study economic and financial trends and patterns in local and global markets, develop market forecasts and advise producers in the agricultural value chain to improve production yield and profitability. They make input into and develop national, regional and global policies for the sustainable growth of agriculture and the economy. Agricultural economists could also focus on the interactions between economic trends and environmental impact and propose more sustainable production processes.

Agricultural economists work mainly in an office environment and could also spend some time in client environments like farms, production or processing plants when consulting and advising farmers and other stakeholders in the agricultural sector.

## Skills

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Agricultural economists must have a comprehensive knowledge of economic trends, patterns, practices and policies related to agriculture, and will additionally benefit from:

- Strong mathematical and statistical skills
- Extensive research competence
- Excellent analytical skills in micro and macroeconomic trends
- Good verbal and written communication and presentation skills

## Tasks

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- Advise on the production, manufacturing and distribution of agricultural products, policy and costs
- Conduct research related to agricultural markets
- Analyse economic patterns and trends and identify opportunities for agricultural development
- Develop costing models for the efficient use of resources

## Studies

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B.Agric., B.Agric. (Hons), M.Agric. in Agricultural Economics at UFH and UFS  
B.Com., B.Com. (Hons), M.Com. in Agricultural Economics at NWU and UP  
B.Sc.Agric., B.Sc.Agric. (Hons), M.Sc.Agric. in Agricultural Economics at NWU, SU, UFH, UFS, UKZN, Univen and UP

## Employers

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National, provincial and local government.

Financial and banking institutions.

NGOs, community-based and development organisations and private consultancies.

Research institutions.

Various organisations along the agriculture value chain.



Forestry, Fisheries and the Environment  
Higher Education and Training





## AGRICULTURAL ENGINEER

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Agriculture and related industries are key contributors to the South African economy. Agricultural engineering involves exploring opportunities and challenges related to agricultural production, processing and distribution with the goal of ensuring profitable and sustainable agriculture and related practices.

Agricultural engineers research, design and develop agricultural equipment and machinery, as well as systems and procedures for the production, processing and distribution of agricultural products. Some might focus on adapting farming practices such as ploughing and harvesting techniques to enhance soil quality, developing run-off systems to better manage water use or implementing renewable energy technologies. They also research and develop plans and specifications for the construction and modification of agricultural infrastructure.

As part of multi-disciplinary teams, agricultural engineers engage with varied professionals, exploring innovative strategies and opportunities to deal with challenges. They typically work in offices and laboratories and sometimes on-site to assess the needs of farming and related operations.

## Skills

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Agricultural engineers must have a comprehensive knowledge and ability to apply scientific and mathematical principles and be able to use popular engineering and design software to design equipment, machinery and processes. They will also benefit from:

- Creative problem-solving skills
- Analytical and logical reasoning skills
- Project management
- Written and verbal communication and presentation skills

## Tasks

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- Design and manage agricultural equipment, machinery and processes
- Oversee and manage construction and production operations
- Modify environmental factors that affect agricultural production
- Research technical problems and develop new methods and techniques

## Studies

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B.Sc.Agric. in Agricultural and Rural Engineering at Univen

B.Sc.Eng. in Bio-resources Engineering at UKZN

B.Sc.Eng. in Mechanical Engineering at UCT, UKZN and Wits

B.Eng. in Mechanical Engineering at NWU, SU, UJ and UP

## Employers

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National, provincial and local government.

Financial and banking institutions.

NGOs, community-based and development organisations and private consultancies.

Research institutions.

Agricultural equipment manufacturers.

Various organisations along the agriculture value chain.



Forestry, Fisheries and the Environment  
Higher Education and Training





## AGRICULTURAL EQUIPMENT OPERATOR

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Agriculture plays a critical role in South Africa's economy. It is a key employer and provides food, fibre and fuel for domestic use and further production of goods and services. Agriculture is becoming increasingly mechanised to maximise production yield and keep pace with demand. Highly specialised equipment and machinery used in agricultural production requires competent and skilled operators.

Agricultural equipment operators drive and operate varied equipment and machinery used in agricultural production. They use equipment and machines to clear, cultivate and sow land. Some harvest and transport crops or assist in spraying crops with fertilizer and pesticides. They inspect tools and equipment to ensure safe and effective operation as well as run basic maintenance and repairs.

Agricultural equipment operators spend majority of their time in farming fields and work long hours in peak seasons. They can also be exposed to dangerous chemical and equipment and are required to work in all types of weather conditions.

## Skills

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Agricultural equipment operators must have a strong understanding of how to operate and monitor heavy machinery. They need to have good physical stamina and strength, also benefitting from:

- Hand-eye coordination and simple decision making
- Ability to troubleshoot machinery issues
- Run basic repairs on operating machinery
- Good driving ability

## Tasks

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- Operate tractors, combines, irrigation and other farm equipment
- Attach farm implements such as sprayers to harvesters or tractors
- Monitor, repair, and service farm machinery when machines malfunction
- Load hoppers, containers, or conveyors to feed machines with products, using forklifts, transfer augers, suction gates, shovels or pitchforks

## Studies

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Agricultural equipment operators will benefit from a National Certificate in Primary Agriculture in Plant Production at National Qualifications Framework Levels 1 to 4 offered at agricultural colleges and most Technical and Vocational Education and Training Colleges. Training could also take place on the job with mentoring by an experienced operator.

## Employers

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Commercial farming organisations.

Private farming operations.



Forestry, Fisheries and the Environment  
Higher Education and Training





## AGRICULTURAL FARM MANAGER

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South African agriculture contributes approximately 2.4% to the national economy and is especially essential for food security, employment and the supply of raw materials to other sectors. The everyday decisions and management of farming operations has the potential to not only maximise profits but also promote effective sustainable farming methods to meet future domestic and production needs.

**Agricultural farm managers plan, direct and coordinate production and other activities on crop or livestock farms. They maintain finance, operation, production and employment records as well as prepare budgets and the sale, storage and transportation of products. They also inspect and analyse crops or livestock to determine prime harvesting time or breeding schedules and address all plant and livestock diseases and illness.**

Agricultural farm managers can work closely with agricultural scientists, engineers and economists to ensure production targets are met. They tend to work between farm fields and offices, working longer hours during busy harvesting periods.

## Skills

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Agricultural farm managers must have the ability to practically apply agricultural theory and knowledge and have a robust understanding of agricultural markets and activities. They may also benefit from:

- Extensive managerial experience
- Strong financial management and knowledge of market trends
- Understand agricultural and labour legislation and regulations
- Excellent written and verbal communication skills

## Tasks

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- Direct and coordinate farm operations and worker activities
- Inspect and analyse crops and livestock for harvest, sale and activity adjustments
- Establish and manage budgets, monitoring economic activity for challenges and opportunities
- Confer with buyers to arrange for the sale of crops and livestock

## Studies

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B.Sc., B.Sc. (Hons), M.Sc. in Agriculture at NWU, SU, UFS, UFH, UKZN, UL, UMP, UNISA, Univen, Unizulu and UP

B. Agric., B. Agric. (Hons), M. Agric. in Agricultural Management at UFS and UKZN

Diploma, Advanced Diploma, M.Tech in Agriculture at CPUT, MUT, TUT and UMP

Diploma and Advanced Diploma in Agricultural Management at CPUT, CUT, NMU and UNISA

## Employers

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Commercial farming organisations.

Agricultural cooperatives.

Private farming companies.



Forestry, Fisheries and the Environment  
Higher Education and Training





## AGRICULTURAL SCIENTIST

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South African agriculture produces a wide range of crops and livestock that meet our daily material needs and wants. It is essential that we manage this sector and its socio-economic benefits through responsible and sustainable resource use. Agricultural science explores the most sustainable and efficient agricultural practices to ensure maximum production and profitability.

Agricultural scientists research and explore large and small-scale commercial and subsistent crop and livestock agricultural practices and production. They study the genetics, reproduction and development of livestock and crops to improve production economic returns. With the evident impact of climate change, they are increasingly concerned with building crop and livestock resilience and to find the best use of land and other natural resources, especially water in water scarce South Africa.

Agricultural scientists work with a range of laboratory processes, equipment and chemicals and can work with various agricultural stakeholders. They often move between farm fields, greenhouses, laboratories and offices.

## Skills

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Agricultural scientists need to have an in-depth knowledge of plants, animals, land use and natural resource management, as well as trends and patterns in agricultural production. Additional key skills include:

- Excellent research ability
- Analytical and problem-solving skills
- Creativity and innovative thinking
- Writing good communicative reports, explaining complex ideas

## Tasks

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- Research the impacts of diverse factors on animal and crop production
- Develop procedures and techniques to address challenges and improve production
- Study environmental factors affecting crop production, pasture growth, animal breeding and the growth and health of plants
- Advise on techniques used to improve production of crops and livestock

## Studies

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B.Sc., B.Sc. (Hons), M.Sc. in Agriculture at NWU, SU, UFS, UFH, UKZN, UL, UMP, UNISA, Univen, Unizulu and UP

Diploma, Advanced Diploma, M.Tech in Agriculture at CPUT, MUT, TUT and UMP

## Employers

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National, provincial and local government.

NGOs, community-based and development organisations and private consultancies.

Research institutions.

Various organisations along the agriculture value chain including specific agricultural sector associations.



Forestry, Fisheries and the Environment  
Higher Education and Training





## AGRICULTURE EXTENSION OFFICER

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The South African agricultural sector and related industries rely on current information to boost agricultural productivity, increase food security and improve rural economic growth. Agricultural extension is the application of scientific research to agricultural practices through providing the link between farmers and research.

Agriculture extension officers liaise with farmers, providing information that supports decision-making for effective and sustainable farming. They engage with scientists to understand new and better ways of ensuring improved and sustainable production and translate this information into advice and guidance for farmers. They are also increasingly supporting the development of smallholder farmers, often through training both in production practices and enterprise development to support access to both formal and informal markets.

Agriculture extension officers work on-site, mostly in rural areas, engaging with farmers in the field. They also spend some time in laboratories and will have their base in an office environment, developing plans for sustainable farming.

## Skills

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A solid understanding of trends and patterns in sustainable agricultural production is vital for agriculture extension officers. Their interaction with farmers and scientists will benefit from:

- Strong communication and interpersonal skills
- Knowledge of the farming environment and enterprise
- In-depth insight into sustainability in agriculture
- Project planning and management

## Tasks

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- Engage with research around sustainable farming practices
- Develop plans and strategies to promote sustainable farming practices
- Liaise with farmers to support increased production yields and implement sustainable practices
- Provide training to support improved and sustainable production processes

## Studies

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B.Sc., B.Sc. (Hons), M.Sc. in Agriculture at NWU, SU, UFS, UFH, UKZN, UL, UMP, UNISA, Univen, Unizulu and UP

B.Agric., B.Agric. (Hons), M.Agric. in Agricultural Extension at UFS, UFH, UKZN, UMP and UP

Diploma and Advanced Diploma in Agricultural Management at CPUT, CUT, NMU and UNISA

Diploma and Advanced Diploma in Agricultural Extension at CUT, TUT and UMP

## Employers

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National, provincial and local government.

NGOs, community-based and development organisations and private consultancies.

Agricultural sector associations.



Forestry, Fisheries and the Environment  
Higher Education and Training





## BIOTECHNOLOGIST

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In South Africa agriculture is a key contributor to the national economy. It contributes around 2.4% to GDP, is a key exporting industry and is critical for local food security. Biotechnology works with living organisms and its derivatives to produce products and investigates processes for higher production yields. It also explores biological crop and plant management for example, in pest control. Biotechnology is also increasing as a career field in the management of invasive alien plants.

Biotechnologists study the anatomy, physiology and characteristics of living organisms and biological molecules and develop new materials for a range of purposes. They examine the chemical, genetic and physicality of cells, tissues and organisms. Some may find ways to improve animal feed or genetically modify crops to make them more pest resistant or to increase productivity. Biotechnologists could also use and research agricultural crops to produce biodegradable plastics or biodiesel.

Biotechnologists can work with farmers, agricultural scientists, engineers and pest management officers in finding the best products for crop growth or plant disease, for example. They mainly work in laboratories, wearing protective clothing as they work with dangerous chemicals and biological specimens.

## Skills

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Biotechnologists must have a solid knowledge of biology and its associated laboratory techniques and an understanding of chemical properties. They will further benefit from:

- Complex problem-solving ability
- Creative and logical analytical ability
- Strong organisation and attention to detail
- Excellent written and verbal communication skills

## Tasks

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- Design, implement and monitor research experiments
- Collect, study and test cell, tissue, bacteria and living organism samples
- Analyse findings and identify practical applications and potential risks
- Record and disseminate results in reports and presentations

## Studies

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B.Sc., B.Sc. (Hons), M.Sc. in Biotechnology at SU, UJ, UKZN, UP and UWC

B.Sc., B.Sc. (Hons), M.Sc. in Microbiology at all universities

Diploma, Advanced Diploma, M.Tech in Biotechnology at CPUT, DUT, TUT, UJ and VUT

## Employers

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Agricultural and crop production companies.

Conservation organisations.

Biotechnology and genetic engineering organisations.

Pharmaceutical and chemical companies.

Research institutions.



Forestry, Fisheries and the Environment  
Higher Education and Training





## GAME FARMER

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South Africa is home to approximately 10 000 game farms, with the wildlife industry contributing significantly to the national economy through the biodiversity economy. As part of the biodiversity economy, the wildlife economy is steadily expanding to focus on wildlife and game farming for ecotourism, the supply of game meat and associated products and restocking and recovering wildlife populations. Game farming involves the breeding and management of wildlife species for services and products in the wildlife economy.

Game farmers plan, organise and perform farming operations to breed and raise game. They regularly inspect game, ensuring grazing areas can support the number of animals on the farm. They plan breeding schedules and organise veterinary assistance if needed. They also plan the sale and transportation of animals and can participate in game capture programmes ensuring the wellbeing of animals during the process.

Game farmers engage with wildlife veterinarians when animals require medical assistance and network with other farmers and reserve managers to ensure the profitability of the game farm. They work between the farm and an office, monitoring game populations.

## Skills

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Game farmers need to have an intricate knowledge of the biology and environmental ecosystems needed for game species to thrive and will additionally benefit from:

- Good leadership and management capability
- Extensive biodiversity and game farming industry experience
- Astute business acumen
- Organisational and administrative competence

## Tasks

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- Examine the physical conditions of animals to detect illness, for example
- Monitor market activity and organise production accordingly
- Coordinate breeding plans and assist with animal births
- Market and arrange the sale, purchase and transportation of animal stock

## Studies

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B.Sc.Agric., B.Sc.Agric. (Hons), M.Sc.Agric. in Animal Science at NWU, SU, UFH, UFS, UNISA, Univen, Unizulu and UP

B.Sc., B.Sc. (Hons), M.Sc. in Biological Sciences specialising in Zoology at all universities

B.Sc.Agric., B.Sc.Agric. (Hons), M.Sc.Agric. in Agribusiness Management or Agricultural Economics at NWU, SU, UFH, UFS, UKZN, Univen, Unizulu and UP

Diploma and Advanced Diploma in Game Ranch Management at NMU and TUT

## Employers

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Game farms.

Private and public game reserves.



Forestry, Fisheries and the Environment  
Higher Education and Training





## HARVESTER / PICKER

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Agriculture contributes 2.4% to the national economy, employs around 810 000 people and is key to securing food security in South Africa. Following crop production or cultivation of crops, fruit, vegetables, fibre and grains, for example, is harvested manually or with machinery. As a key part of the agricultural value chain, crops need to be carefully picked at the right time to be processed, packaged and distributed for consumption.

Harvesters or pickers manually extract crops from orchards or fields ensuring that quality is not compromised during the handling process. They select crops to harvest according to size and ripeness and discard overripe produce. They load harvested produce onto containers or bundles and move them to collection sites where they are sorted and packed. Some harvesters or pickers operate special handheld equipment for specific crops such as nuts, for example.

Harvesters or pickers work in small teams on farms and are exposed to the natural elements. They work with ladders, mechanical hoists, spades and other equipment and are required to wear protective clothing such as gloves, boots and overalls. Work can be seasonal, depending on the crop.

## Skills

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Harvesters or pickers need to be able to identify crops and know when and how to pick crops without causing damage, and will also benefit from:

- Physical stamina and strength
- Foundational measuring and mathematical ability
- Basic machine and mechanical operating capability
- Ability to work as part of a team

## Tasks

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- Select and harvest crops according to size, shape and colour
- Load crops into containers or bind crops into manageable bundles and bales
- Prepare work sites and strategically manage crops into workable units
- Transport crops to collection sites, preparing and assisting the loading of goods onto conveyors, trucks, trailers or containers

## Studies

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Harvesters or pickers can benefit from a National Certificate in Primary Agriculture in Plant Production at National Qualifications Framework Levels 1 to 2 offered at agricultural colleges and most Technical and Vocational Education and Training Colleges. Training could also take place on the job with mentoring by an experienced farm worker.

## Employers

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Farms.



Forestry, Fisheries and the Environment  
Higher Education and Training





## HORTICULTURIST

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South African agriculture produces varied crops from fruit and vegetables to ornamental plants and nuts. Horticulture is the art of cultivating and producing fruit and vegetables, decorative indoor and outdoor plants, landscape plants and grasses, medicinal plants, and other perennial plant species. The sustainable propagation, cultivation and maintenance of seedlings and plants, the work of horticulture, is key in the production of healthy and resilient plants.

Horticulturists propagate and cultivate trees, shrubs and ornamental and flowering plants and grasses. They analyse plants to identify whether they are nutrient deficient, infected with disease or infested with pests, determining the best means to remedy the plant. They draw up maintenance plans for the propagation and care of rare plants as well as garden designs and landscaping. Some also develop and give educational presentations to the public around plant species.

Horticulturists can work with landscape architects, conservationists, town planners and engage with the general public and students around plant education. They mainly work outdoors in nurseries or botanical gardens, for example and return to an office environment to research and plan planting schedules.

## Skills

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Horticulturists require a vast knowledge of indigenous and non-indigenous plant species and the properties that govern their development. They will further benefit from:

- Excellent planning and organisational ability
- Strong project coordination competence
- Creative ability
- Good written and verbal communication ability

## Tasks

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- Oversee the production and care of plants
- Manage crop scheduling for timing of appropriate planting and harvesting
- Perform propagation, irrigation and pest management of plants
- Advise and educate varied stakeholders on plant species

## Studies

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B.Sc. in Agriculture specialising in Horticulture at NWU, SU, UFH, UKZN, UL and Univen

Diploma, Advanced Diploma, M.Tech in Horticulture at CPUT, DUT, TUT and UNISA

Horticulturists can also benefit from a Diploma or General Certificate in Horticulture at Cedara Agricultural College and Elsenburg Agricultural Training Institute.

## Employers

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National parks and botanical gardens.

Plant nurseries.

Landscaping firms.

Golf, country and housing estates.



Forestry, Fisheries and the Environment  
Higher Education and Training





## HYDROLOGIST

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Agriculture plays a significant role in the South African economy, contributing 2.4% towards GDP, employing around 810 000 people and is key in securing food security. It is also one of the most vulnerable sectors in the context of climate change, given its significant dependence on water resources. In South Africa, agriculture uses an estimated 63% of total water available. In this context, hydrology plays a critical role in understanding and managing the movement and distribution of water for sustainable use.

Hydrologists study the quality, quantity, distribution, circulation and physical properties of surface and underground water. They study the impact of precipitation and identify water supply sources to evaluate the effect of human activities on the quantity and quality of water as well as study interactions between components within the hydrological cycle. They also map and model future water levels by tracking usage and precipitation data and advise on effective water use programmes.

Hydrologists work with agricultural scientists, engineers and other professionals to ensure acceptable water levels are used. They spend a lot of time in the field in catchment and consumer areas for observation. And spend some time in a laboratory and office to analyse collected data.

## Skills

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Hydrologists need to have a comprehensive understanding of the hydrological cycle and an understanding of water policies and regulations. They will further benefit from:

- Extensive research and fieldwork capability
- Ability to geographically map and model hydrological data
- Excellent analytical and problem-solving ability
- Good verbal and written communication and presentation skills

## Tasks

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- Collect and analyse water and soil samples
- Create, test and interpret prediction models and maps
- Evaluate the feasibility of water-related projects
- Prepare written reports and presentations on research findings

## Studies

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B.Sc., B.Sc. (Hons), M.Sc. in Hydrology at NWU, UKZN, Univen and Unizulu

B.Sc., B.Sc. (Hons), M.Sc. in Geology specialising in Hydrogeology at UFS, UP and Wits

## Employers

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National, provincial and local government.

Research institutions.

Water utility companies.

Private consultancies.



Forestry, Fisheries and the Environment  
Higher Education and Training





## INDOOR PLANT WORKER

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South African agriculture produces a variety of products from fibre, fruit, grains, vegetables, poultry and livestock and ornamental horticulture amongst others. Ornamental horticulture involves the production of flowers and plants for landscaping, gardening and indoor display. Indoor plants are often more resilient in enclosed spaces as compared to outdoor plant variations. They help to purify the air and add aesthetic appeal to spaces such as offices, restaurants and retail spaces, for example.

Indoor plant workers assist with the planting and care of indoor plants. They check whether plants require water and based on soil moisture measurements, water plants as needed. They also rotate and prune away dead and diseased plant matter as well as clean dust accumulated on plants. Indoor plant workers also inspect plants for evidence of pests or disease and select and apply the appropriate course of treatment or replace the plant if needed.

Indoor plant workers work as part of a team and travel to maintain indoor plants in varied business and domestic spaces. They return to a nursery environment to treat and grow indoor plants and attend to administrative tasks.

## Skills

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Indoor plant workers require a good knowledge of indoor plants, their characteristics and the principles for growing them and will further benefit from:

- Good customer service skills
- Time management competence
- Ability to work as part of a team
- Good interpersonal skills

## Tasks

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- Identify and replace unhealthy or unsightly plants
- Water indoor plants, adjusting the schedule if environmental factors change
- Feed and fertilize plants and conduct simple soil tests to determine if nutrients are needed
- Control the spread of pests, fungi and viruses on plants

## Studies

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Indoor plant workers may benefit from a National Certificate in Primary Agriculture in Plant Production at National Qualifications Framework Levels 1 to 4 offered at agricultural colleges and most Technical and Vocational Education and Training Colleges. Training could also take place on the job with mentoring by an experienced mentor.

## Employers

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Indoor plant rental companies.  
Nurseries.



Forestry, Fisheries and the Environment  
Higher Education and Training





## IRRIGATIONIST

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South Africa is a water scarce country that experiences variable rainfall, seasonally and geographically, agriculture uses 67% of available water in South Africa. Smart, water wise irrigation systems can help the efficient use of water resources in agriculture, that is key to the economy and ensuring food security. Irrigation involves the watering of crops through varied systems of tubes, pumps and sprays so that crops receive the optimal amount of water to grow.

Irrigationists install and maintain irrigation systems to ensure optimum soil moisture levels for the production of crops. They lay pipes down with a predetermined number of sprinkler heads at specified points or adjust lateral-moving irrigation systems to maximise the watering of crop areas. They also perform maintenance of these systems by repairing or replacing valves, pumps and other equipment. They can further install timers and clocks as well as prepare equipment for use during winter periods.

Irrigationists work in teams, coordinating with farm managers and supervisors in the irrigation of crops. They predominately work outdoors in farming areas and can be exposed to adverse weather conditions.

## Skills

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A good understanding of basic irrigation, hydraulic and electrical principles is needed by irrigationists. They will additionally benefit from:

- Physically fitness and stamina to walk large farm fields
- Ability to read blueprints and technical diagrams
- Capability to drive and operate farming machinery
- Good teamwork and communication competence

## Tasks

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- Assemble, disassemble or move portable irrigation systems
- Measure and estimate the quantity of water required
- Operate water pumps, regulating and controlling water flows
- Monitor and perform maintenance on all parts of an irrigation system

## Studies

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Irrigationists can benefit from a National Certificate in Landscape Irrigation at National Qualifications Framework Level 1 to 2, accredited by the Agriculture Sector Education Training Authority.

They can also benefit from a National Certificate in Primary Agriculture in Plant Production at National Qualifications Framework Levels 1 to 2 offered at agricultural colleges and most Technical and Vocational Education and Training Colleges. Training could also take place on the job with mentoring by an experienced irrigation technician.

## Employers

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National and provincial government.

Commercial and small-scale farms.

Agricultural co-operatives.

Research institutions.



Forestry, Fisheries and the Environment  
Higher Education and Training





## LIVESTOCK FARM FOREMAN

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Livestock farming is South Africa's largest agricultural sector and includes the production of cattle, pigs, sheep, goats, rabbits and ostrich. Meat, especially red meat is widely a South African favourite. Meat is also a key export product. Export markets for meat products are stringent and require adherence to specific health and quality standards. The sustainable production of livestock needs careful consideration to meet market standards and consumer health and safety needs.

Livestock farm foremen plan, organise and perform farming operations to breed and raise livestock. They cultivate pastures and provide and monitor fodder and water supplies to maintain the nutrition of livestock. They supervise the caretaking of animals and the control of illnesses and direct the breeding or raising of stock using recognised breeding practices to ensure stock improvement. Livestock farm foremen also maintain and clean farm facilities.

Livestock farm foremen can work closely with veterinarians and other professionals in the breeding and health maintenance of livestock. They mainly work outdoors or in farm buildings, working longer hours when animals are bred and born.

## Skills

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Livestock farm foremen need a solid understanding of animal production systems and principles and the health and safety standards of a farm. They will also benefit from:

- Good organisational and planning competence
- Ability to troubleshoot basic machinery issues
- Physical stamina and strength
- Effective communication skills

## Tasks

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- Distribute feed and water to livestock, monitoring level of supplies
- Monitor and examine animals to detect injury, illness or disease
- Maintain, clean farm buildings, machinery, equipment and structures
- Store and process animal and dairy produce

## Studies

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B.Sc.Agric. in Animal Science at NWU, SU, UFH, UFS, UNISA, Univen, Unizulu and UP

Diploma in Agriculture in Animal Production at CPUT, CUT, Fort Cox Agriculture and Forestry Training Institute, MUT and TUT

Livestock farm foremen can benefit from National Certificate or Further Education and Training Certificate in Primary Agriculture: Animal Production at National Qualifications Framework Level 1 to 4 offered at most Technical and Vocational Education and Training Colleges and Elsenburg Agricultural Training Institute. Training could also take place on the job with mentoring by an experienced farm foreman.

## Employers

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National and provincial government.

Commercial and small-scale farms.

Agricultural cooperatives.

Research institutions.



Forestry, Fisheries and the Environment  
Higher Education and Training





## MIXED CROP FARM PRODUCTION FOREMAN

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Agriculture is a key contributor to South Africa's economy, people and culture, with crop production accounting for some 52% of agricultural production. Crop production in South Africa is highly diverse, including grains, cereals, vegetables, fruit, nuts, flowers, fuel and fibre. Sustainable farming practices such as growing more than one crop variety simultaneously in the same field, also known as mixed crop production, enables more profitable and effective production, increasing yield stability, resource efficiency and minimising the risk of pest infestation.

Mixed crop farm production foremen oversee, coordinate and perform farming operations to grow a range of crops. They supervise the planting, fertilizing, watering, cultivating and harvesting procedures of two or more types of crops and monitor and adjust processes according to the different crop requirements. They also maintain farm facilities and equipment, ensuring production needs are met. Some also monitor market trends to determine the best type and quantity of crops to grow.

Mixed crop farm production foremen can work with agronomists, soil scientists and other professionals in the production of crops. They tend to work between farm fields and offices, working longer hours during busy harvesting periods.

## Skills

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Mixed crop farm production foremen require knowledge of varied crop types and their associated production requirements and health and safety standards of a farm, coupled with:

- Good organisational and planning ability
- Ability to troubleshoot basic machinery issues
- Effective communication skills
- Physical stamina and strength

## Tasks

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- Plan and coordinate production of mixed types and quantities of crops
- Sow seeds, plant seedlings and maintain and harvest crops
- Maintain farm building structures, equipment and water supply systems
- Assist in arranging the sale, purchase and transportation of produce and supplies

## Studies

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B.Sc. in Crop Science or Plant Production at NWU, Univen, Unizulu and UP  
B.Sc.Agric. in Crop or Plant Science at SU, UFH, UFS and UKZN

Diploma and Advanced Diploma in Agriculture specialising in Crop Production at CPUT, MUT, TUT and UMP

They can also benefit from a Diploma or National Certificate in Primary Agriculture in Plant Production at National Qualifications Framework Levels 1 to 4 offered at agricultural colleges and most Technical and Vocational Education and Training Colleges. Training could also take place on the job with mentoring by an experienced farm foreman.

## Employers

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National and provincial government.

Commercial and small-scale farms.

Agricultural cooperatives.

Research institutions.



Forestry, Fisheries and the Environment  
Higher Education and Training





## PEST MANAGEMENT OFFICER

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Pest control is vital in ensuring public health and safety and also plays a critical role in ensuring food security, livelihoods and economic contribution of agriculture by reducing the risk of disease and pest infestations. In agriculture, pest management is especially important for effective and sustained production, the prevention of damage to crops and livestock and excessive waste of resources. Pest management is the eradication or control of pest species that ensure human, animal and plant health.

Pest management officers identify pests and monitor and control threats and infestations according to environmental protection, public health and food safety regulations and protocols. They identify the type and extent of pest invasion, often collecting samples for laboratory testing. They will then provide strategies for the eradication of pests, taking into consideration financial, social and environmental aspects. Some are consulted in agricultural farming, around the identification and eradication of pest and vector breeding occurrences.

Pest management officers work in offices but spend a considerable amount of time inspecting pest sites such as homes, factories, farms and warehouses, for example. They can be exposed to areas that may be contaminated and potentially dangerous and are required to wear protective clothing and equipment.

## Skills

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Pest management officers must have a comprehensive knowledge of pest varieties and associated elimination techniques and an understanding of public health and safety regulations and procedures, along with:

- Good customer service skills
- Strong organisation and keen attention to detail
- Physical stamina
- Good written and verbal communication ability

## Tasks

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- Inspect for the presence of pest and vulnerabilities to infestation
- Select, recommend and motivate appropriate pest control procedures
- Apply and implement pest control procedures
- Monitor, measure and record the success of control procedures

## Studies

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B.Sc., B.Sc. (Hons), M.Sc. in Environmental Health at NMU, UJ and UP  
Diploma, Advanced Diploma, M.Tech in Environmental Health at CPUT, CUT, MUT and TUT

Pest management officers can also benefit from a Further Education and Training Certificate in Pest Control Operations at National Qualifications Framework Level 4 offered at Pest Control Industries Training Academy and Pest Management Academy. Training could also take place on the job with an experienced mentor.

## Employers

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National, provincial and local government in agriculture and public health and safety.

Pest elimination companies.



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## PROCUREMENT MANAGER

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Global economies are all highly dependent on efficient and effective procurement of goods and services, either as value add or consumer products. For efficiency in production and supply, and particularly within the perishable goods value chain such as agriculture and fishing, timeous, appropriate, efficient and effective procurement, upstream and downstream, is critical. Procurement of goods and services are therefore a critical component in all goods and services value chains to maximise efficiency, enable sustainability and minimise waste.

Procurement managers plan, administer and review the supply, storage and distribution of equipment, materials and goods. They research and forecast levels of demand for services and products and develop and monitor distribution requirement plans and budgets to see to these needs. They also source suppliers, undertake contract negotiations and establish service programs to match the company's requirements. Procurement managers can also run risk assessments to ensure sourcing processes are safe, reliable and sustainable.

Procurement managers work closely with farm operators and managers, engineers, varied suppliers and legal professionals to ensure essential supplies are procured. They mainly work in an office environment and occasionally travel to supplier sites.

## Skills

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Procurement managers require in-depth knowledge of supply chain structures and functioning and a comprehensive understanding of markets. They will also benefit from:

- Strong interpersonal and negotiation skills
- Excellent analytical and problem-solving ability
- Solid financial management and business experience
- Effective project management skills

## Tasks

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- Determine, implement and monitor purchasing, storage and distribution strategies, policies and plans
- Negotiate contracts with suppliers to meet quality, cost and delivery requirements
- Establish and direct operation and administration procedures
- Establish and manage budgets and control expenditure ensuring efficient resource use

## Studies

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B.Com., B.Com (Hons), M.Com. in Supply Chain Management at SU, UKZN, UNISA and UP

Diploma, Advanced Diploma, M.Tech in Supply Chain Management at TUT

## Employers

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National, provincial and local government.

All forms of commercial scale business.



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## SUSTAINABILITY MANAGER

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Modern consumer lifestyles demand much from our natural resources and ecosystem services, in addition to value add goods and services used in the processing and production of goods and services, packaging and distribution. As the demand for goods and services increases, so does the demand for more equitable and sustainable production processes, both globally and locally. Sustainability practices ensure a steady and constant flow of goods and services, the production and supply of which uses resources efficiently and optimally and minimises the generation of waste.

**Sustainability managers plan, organise, direct, control and coordinate sustainability or environment-related risk assessments of an organisations business practices. They develop methodologies to assess the viability or success of sustainability initiatives as well as monitor and evaluate their effectiveness. They then advise on ways to improve operations and set goals to achieve sustainability targets. Sustainability managers can also create and implement staff training programs to increase participation and practice of environmental initiatives.**

Sustainability managers engage with organisations personnel as well as external stakeholders that contribute to sustainable business operations. They mainly work in an office environment and occasionally travel to investigate specific company operations or meet stakeholders.

## Skills

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Sustainability managers require a thorough understanding of global and local sustainability concepts, goals and objectives and have a working knowledge of environmental trends, legislation, policies and guidelines, coupled with:

- Strong interpersonal and leadership skills
- Critical problem-solving and analytical thinking ability
- Excellent organisational and project management competence
- Good verbal and written communication and presentation skills

## Tasks

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- Evaluate and develop methodologies for sustainability initiatives
- Enact and socialise policies on an organisations energy use, resource conservation and waste management
- Supervise employees in sustainability endeavours
- Advise on meeting regulations laid out in environmental law

## Studies

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B.Sc., B.Sc. (Hons), M.Sc. in Environmental Management at UFS, UJ, UNISA and UP

B.Sc., B.Sc. (Hons), M.Sc. in Environmental Science at NMU, RU, UCT, UJ, UKZN, UMP, UP, UWC and Wits

B.Sc., B.Sc. (Hons), M.Sc. in Geography and Environmental Studies at all universities

Diploma and Advanced Diploma in Environmental Management at CPUT

Diploma and Advanced Diploma in Environmental Science at TUT

## Employers

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National, provincial and local government.

NGOs, community-based and development organisations.

Engineering and environmental consultancies.

Industrial processing and mining companies.

Property development and construction companies.

Waste management companies.



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