Training Course on Managing Salinity and Sodicity in Arid and Semi-Arid Agriculture

Professional Development Training Course Outline

Category	Agriculture	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Training Course on Managing Salinity and Sodicity in Arid and Semi-Arid Agriculture is designed to address the escalating challenge of soil degradation in water-scarce regions. With climate change intensifying water stress and irrigation mismanagement exacerbating salt accumulation, arid and semi-arid zones are witnessing declining productivity and soil fertility. This specialized course equips agricultural professionals, extension workers, and environmental managers with cutting-edge tools and sustainable techniques to diagnose, manage, and rehabilitate salt-affected soils, enhancing agro-ecosystem resilience and ensuring food security.

Through a blend of scientific knowledge, field-based case studies, and practical applications, participants will learn to identify types of salinity and sodicity, apply appropriate remediation strategies, and integrate climate-smart soil management practices. This course integrates GIS-based mapping, soil health assessment, regenerative practices, and policy frameworks to promote long-term solutions in vulnerable landscapes.

Programme Curriculum

Training Course on Managing Salinity and Sodicity in Arid and Semi-Arid Agriculture

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Course Objectives

1. Understand the principles of salinity and sodicity in soil systems.
2. Diagnose salinity and sodicity issues using modern tools.
3. Apply GIS and remote sensing for salt-affected land mapping.
4. Promote sustainable irrigation practices in arid zones.
5. Utilize climate-resilient crop selection and rotation systems.
6. Implement biological and organic soil amendments for soil restoration.
7. Integrate soil and water conservation techniques for arid regions.
8. Analyze case studies on salt-tolerant agriculture innovations.
9. Leverage digital soil health monitoring technologies.
10. Formulate policy interventions for managing degraded soils.
11. Build community awareness on climate-smart agriculture practices.
12. Identify socio-economic impacts of soil salinization.
13. Promote regenerative agriculture in semi-arid ecosystems.

Target Audiences

1. Agricultural Extension Officers
2. Environmental Scientists
3. Soil and Water Engineers
4. Agronomy and Horticulture Experts
5. Rural Development Professionals
6. Climate Change Mitigation Planners
7. Land Use and GIS Specialists
8. NGO and Government Agriculture Stakeholders

Course Duration: 10 days

Course Modules

Module 1: Introduction to Soil Salinity and Sodicity

- Definitions and basic science of salt-affected soils
- Types and distribution in arid/semi-arid regions
- Causes of salinity and sodicity
- Impact on crops and soil structure
- Indicators and symptoms in the field
- **Case Study:** Salinity spread in Pakistan’s Indus Basin

Module 2: Soil Testing and Diagnostic Tools

- Soil sampling protocols
- Electrical conductivity (EC) and SAR measurements
- Laboratory analysis of soil chemistry
- Mobile and digital diagnostic kits
- Interpreting soil health reports
- **Case Study:** Mobile soil labs in Rajasthan, India

Module 3: Remote Sensing & GIS for Salt Mapping

- Satellite imagery analysis
- Salinity indices and mapping layers
- Using drones and UAVs for monitoring
- Integrating field data with GIS
- Geostatistical analysis
- **Case Study:** FAO salinity mapping in Tunisia

Module 4: Irrigation Management Strategies

- Irrigation scheduling and water use efficiency
- Impact of poor-quality water on salinization
- Subsurface drainage and leaching techniques
- Drip and sprinkler systems
- Reclamation using flushing methods
- **Case Study:** Israel’s drip irrigation innovation

Module 5: Crop Selection and Salt Tolerance

- Halophytes and salt-tolerant cultivars
- Crop diversification for resilience
- Rotation and intercropping
- Soil-plant-water relationships
- Genetic improvement and biotech tools
- **Case Study:** Quinoa adoption in Andean drylands

Module 6: Organic and Biological Amendments

- Use of compost and green manures
- Role of gypsum and elemental sulfur
- Microbial biofertilizers
- Enhancing soil organic matter
- Impact on pH and sodium reduction
- **Case Study:** Bio-remediation in Egypt’s reclaimed lands

Module 7: Regenerative Soil Practices

- No-till and minimum tillage
- Mulching and cover cropping
- Carbon sequestration in drylands
- Soil microbiome restoration
- Benefits to long-term productivity
- **Case Study:** Regenerative farm model in Australia

Module 8: Drainage System Design

- Principles of drainage engineering
- Types of drainage: open vs. closed
- Designing drainage networks
- Materials and construction practices
- Maintenance protocols
- **Case Study:** Haryana's canal-drainage solutions

Module 9: Groundwater Management

- Understanding groundwater-salinity linkages
- Aquifer recharge techniques

- Monitoring and safe extraction limits
- Salinity-resistant aquifers
- Rainwater harvesting integration
- **Case Study:** Managed aquifer recharge in Jordan

Module 10: Water Quality Monitoring

- Salinity and TDS thresholds
- Portable water testing kits
- Data collection and interpretation
- Integration with crop choice
- Community water monitoring systems
- **Case Study:** Farmer-led monitoring in Kenya

Module 11: Climate Change Impacts on Soil Salinity

- Climate models and salt accumulation risks
- Sea-level rise and coastal salinity
- Temperature shifts and evaporation
- Risk assessment tools
- Adaptation strategies
- **Case Study:** Coastal salinity in Bangladesh

Module 12: Socio-Economic Impacts and Gender Inclusion

- Household impacts of declining soil productivity
- Labor and migration due to land degradation
- Women-led soil recovery projects
- Community empowerment tools
- Financial risk mitigation (crop insurance)
- **Case Study:** Gender-inclusive land programs in Ethiopia

Module 13: Policy, Governance, and Land Use Planning

- Regulatory frameworks and best practices
- Land tenure and soil management
- Integrating salinity issues into policy
- Government incentives for soil conservation
- Multi-stakeholder engagement
- **Case Study:** Soil policy reform in Uzbekistan

Module 14: Technology and Innovation in Salinity Management

- AI and IoT in soil monitoring
- Mobile apps and farmer advisory platforms
- Blockchain for land-use data
- Decision-support systems
- Precision farming innovations
- **Case Study:** SmartFarm solutions in Morocco

Module 15: Action Plan and Community-Based Implementation

- Developing local salinity management plans
- Training local trainers and farmer groups
- Setting monitoring KPIs
- Fundraising and donor engagement

- Community ownership and feedback loops
- **Case Study:** Participatory land rehab in Niger

Training Methodology

- Interactive expert-led lectures
- Hands-on field demonstrations
- GIS and remote sensing lab training
- Real-world case study analyses
- Group activities and problem-solving workshops
- Pre- and post-training assessments

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

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