High-tech Solutions for Dryland Farming

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To ensure food security and mitigate climate change!
Contents

• Dryland farming and climate change in the Asia-Pacific region
• Examples/cases of high-tech solutions for dryland farming
• Recommendations and way forward
Dryland farming and climate change in the Asia-Pacific region

Member States and Associate members of ESCAP

60% of global population (~4.8 bn)
Largest agricultural production share

Differential impacts of extreme weather events in the APR

Drought impact on agriculture
GHG emissions from agriculture
China's "dual carbon" goals
Agricultural green production

Source: IPCC AR6

60% of global population (~4.8 bn)
Largest agricultural production share
Soil water conservation by innovative mulching practices

Efficient use of small rainfall
Increasing rainwater infiltration
Regulating soil hydrothermal conditions
Reducing soil evaporation
Improving crop production
Inhibiting weed growth

Environment-friendly (95% after a year)
Four-in-one rainwater harvesting for supplementary irrigation

Supplementary irrigation in dry seasons with stored rainwater from rainy season
Especially suitable for regions with sloping terrain and lack of electricity

Solar-powered pumping & irrigation
Saving energy
Low investment & maintenance
Improving crop production
Remote control

Four-in-one irrigation system
Solar pumping system
Gully dam
Solar expansion tank
Anti-evaporation pond
Solar-powered drip irrigation
Solar-powered sprinkler irrigation
Intelligent irrigation and fertilization system

Saving energy
Low investment & maintenance
Improving crop production
Remote control

Remote control
Crop water & nitrogen monitoring & diagnosis by remote sensing

UAV multispectral remote sensing
Image clipping and data processing

Spatial pattern of crop water stress index
Spatial pattern of nitrogen nutrition index

Big scale
Small scale
Point scale

Space–Sky–Earth Integration Technology

Multispectral and thermal sensing
Autonomous cruise
Fast and non-destructive monitoring
Precise diagnosis
Large-scale application
Intelligent agricultural machinery in dryland farming

Digital and smart mechanization technologies

Terrain-adaptive plowing machine

Seeding machine with emergence irrigation

Drones for fertilizer/pesticide/herbicide spaying

Beidou-guided unmanned harvesting machine

Fruit-picking robot

Intelligent agricultural machinery makes dryland farming more efficient and reduces labor costs
Recommendations and way forward

- Increasing investment & making incentive policy
- Agricultural education & extension
- Strengthening early warning systems
- Breeding climate change-ready crop varieties
- Digital and smart mechanization technologies
- Strengthening regional cooperation and solidarity
Thanks for your attention!

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