FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
for a world without hunger

Agriculture and
Consumer Protection Department

Building climate resilience in the agriculture sector of Asia
- the ***Save and Grow*** view –

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Outline

- Challenges in Crop Production in Asia
- Save and Grow – Climate resilient systems
- Application to Asian agriculture
- Implications for mechanization
- Conclusions

Challenges in Crop Production in Asia

- Rapidly growing population
- No additional land resources
- Water resources already at verge of overexploitation
- High GHG emissions from rice
- Stagnating crop productivity
- Increase of extreme weather

Save and Grow – Climate resilient systems

- Save and Grow: the concept of sustainable intensification
- Base concept for Save and Grow: Conservation Agriculture, complemented with other good practices (IPM, IPNM, Biodiversity/Genetic Resources management, integrated water management, SRI...)

Save and Grow – Climate resilient systems

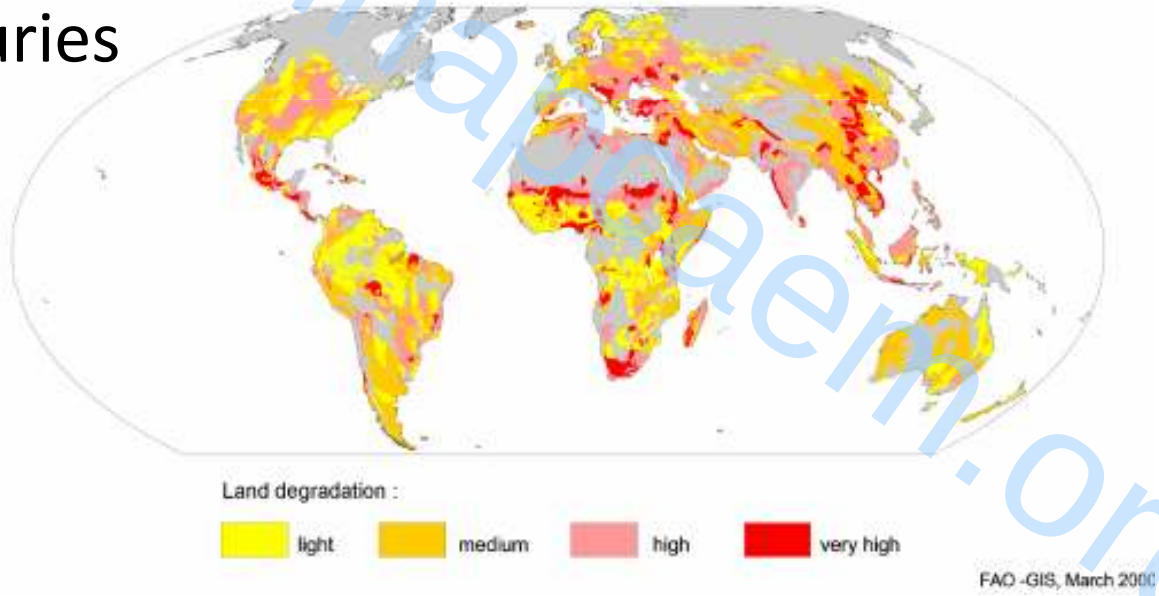
Conservation Agriculture (CA) is an approach to managing agro-ecosystems for improved and sustained productivity, increased profits and food security while preserving and enhancing the resource base and the environment. CA is characterized by three linked principles, namely:

1. Continuous minimum mechanical soil disturbance.
2. Permanent organic soil cover.
3. Diversification of crop species grown in sequences or associations.

(www.fao.org/ag/ca)

Save and Grow – Climate resilient systems

Climate resilience starts with healthy soils – agricultural soils have been degraded over centuries



(suggested reading: Dirt – the erosion of civilizations by David Montgomery)

Save and Grow – Climate resilient systems

Healthy soils build up with soil life and organic matter – this is incompatible with mechanical soil tillage

Save and Grow – Climate resilient systems

Adaptation extreme events:

- Erosion:
  stubbel, mulch, crops
  aggregate stability (OM)

- Heat: mulch

- Frost: mulch

Save and Grow – Climate resilient systems

Adaptation to heavy rain:

- water recharge (biopores)
- water quality (leaching/erosion)
- Better/deep infiltration (flooding during monsoon)

Save and Grow – Climate resilient systems

Adaptation to drought:

- better rooting
- snow catching with residues
- more water in soils
  (1 % OM = 150 m3/ha)
- reduced water losses
  (evaporation)
- better efficiency
  (water/crop -30%)

Save and Grow – Climate resilient systems

Increase the resilience through:

- diversity in the cropping
- diversity in the overall production
- higher flexibility/more timely operations
- agronomic practices that work for drought, rain, heat, cold, wind

Save and Grow – Climate resilient systems

Diversity = rotations = long term profit

- different rooting structures
- pest and desease management
- weed management
- soil cover/residue managment strategy
- higher long term productivity, risk reduction

Application to Asian agriculture

Conservation Agriculture based cropping systems adapted to all cropping systems, complemented with other GAPs

Application to Asian agriculture

The special case of rice:

- No-till, no puddling
- Direct seeding or no-till transplanting
- No hardpan, no permanent flooding
- Option: permanent bed and furrow systems
- Residue retention/management
- SRI based management

Implications for mechanization

- No ploughing, puddling

- No-till seeding/planting with residue handling

Implications for mechanization

- Avoid soil compaction – eventually with CTF/permanent bed and furrow systems

Implications for mechanization

- Harvest preferably combining to reduce turnover time/retain straw residues in field

Conclusions

- Conservation Agriculture based cropping systems can increase climate resilience and mitigate climate change = climate smart
- This climate smart agriculture impacts on the mechanization requirements and can be facilitated by appropriate technologies
- Suitable mechanization solutions exist already in Asia for those cropping systems

Save and Grow
the Agriculture of the Future – the Future of Agriculture

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Join the CA-CoP!