

Sustainable land management and agriculture in Central Asia

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Featuring IFPRI's 2018 Global Food Policy Report

icarda.org

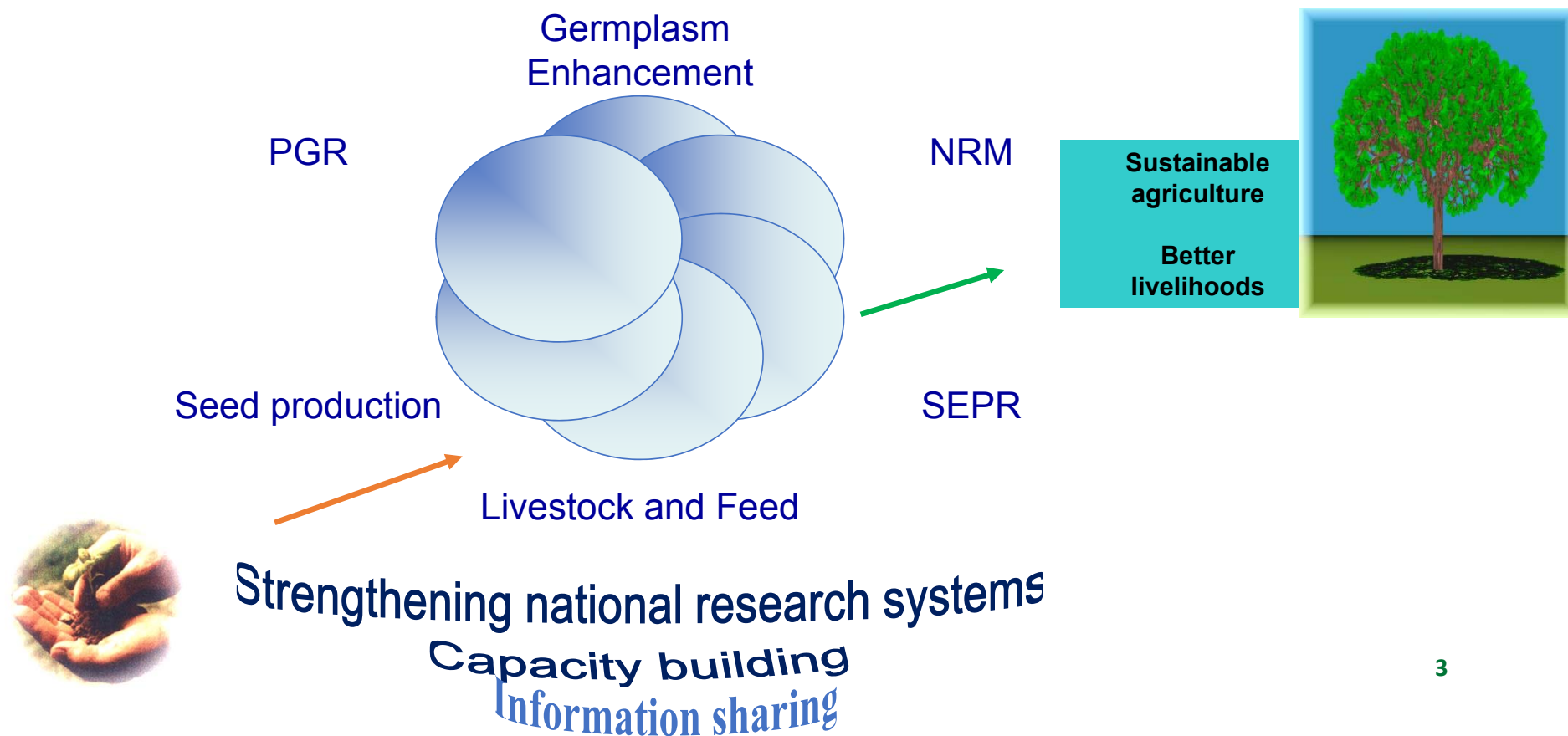
International Center for Agricultural Research in the Dry Areas

Scope of presentation – Farming practices for sustainable land management

1. Sustainable land management in relation to food security
2. Conservation agriculture
3. Tillage practices
4. Irrigation practices
5. Cropping systems diversification
6. Knowledge management



ICARDA's Strategic Research Thrusts in Central Asia and the Caucasus



Sustainable land management - ICARDA Research Projects

<u>Project</u>	<u>Duration</u>	<u>Donor</u>	
1. On-farm soil and water management	2000-2007	ADB	
2. Integrated feed and livestock production	2006-2009	IFAD	
3. PGR conservation, documentation and improvement of gene banks	2004-2007	GCDT, ACIAR	
4. Conservation agriculture in Karakalpakstan	2004-2007	FAO	
5. Seed production of cereals, leguminous, oil and forage crops	2004-2007	FAO	
6. Bright Spots project	2005-2008	ADB	
7. Sustainable land management	2007-2009	ADB	
8. Livestock	2009-2013	IFAD	
9. Salinity tolerant wheat	2010-2013	GIZ/BMZ	
10. Pastoral user groups	2011-2013	BMU Germany	

Sustainable land management - ICARDA Research Projects

<u>Project</u>	<u>Duration</u>	<u>Donor</u>
11. Sorghum and pearl millet	2011-2014	IDB through ICBA
12. Conservation agriculture	2011-2013	FAO
13. Climate change adaptation	2012-2014	CRP Climate change
14. Community reforestation	2012-2013	BMU Germany
15. Yellow rust resistance	2012-2014	CRP Wheat
16. CACILM Knowledge Management Phase II	2013-2015	IFAD
17. Crop-Livestock Cons. Agri.	2013-2015	IFAD
18. Germplasm enhancement	1998 - ongoing	Core, CRPs
19. Adoption wheat technologies	2013 - 2016	CRP Wheat
20. Research and capacity building	2012 - 2016	Russian Federation
21. Innovation Platform for Sustainable Soil Management	2018 - 2019	Russian Federation
22. Strengthening Institutional Knowledge Management	2018 - 2021	IFAD

Sustainable land management – tillage and water management



Sustainable land management – cropping systems



Food legumes



Cropping geometry

Fodder crops



Crop-livestock integration

Sustainable land management

Conservation Agriculture

→ Undisturbed soils

- Reduce ploughing, manage soil cover, increase diversity
- Improves soil
 - Humus
 - Salinity
- Stabilizes / improves yields
 - Safeguard against droughts
- Saves costs and time for farmer → higher income



Sustainable land management

Promoting Conservation Agriculture

Mungbean after wheat using minimum and zero tillage with retention of crop residues in Karshi, Uzbekistan (2011-2013)

Planting method	Spent fuel for planting, l/ha	Root length, cm	Plant height, cm	Yield, t/ ha
Conventional	53.6	25.4	67.2	1.85
One cultivation	13.6	23.5	68.8	1.97
No-till	5.9	23.8	65.4	2.24

- Fuel saving
- Higher yield
- Improves soil health

Source:
A. Nurbekov,
ICARDA



Sustainable land management

Laser-guided land leveling



- saves >15% irrigation water
- Lower soil movement during irrigation

Sustainable land management

Bed-planting into standing stubble

- Saves time interval between two crops
- Saves water
- Possible to manage salinity
- Improves soil health



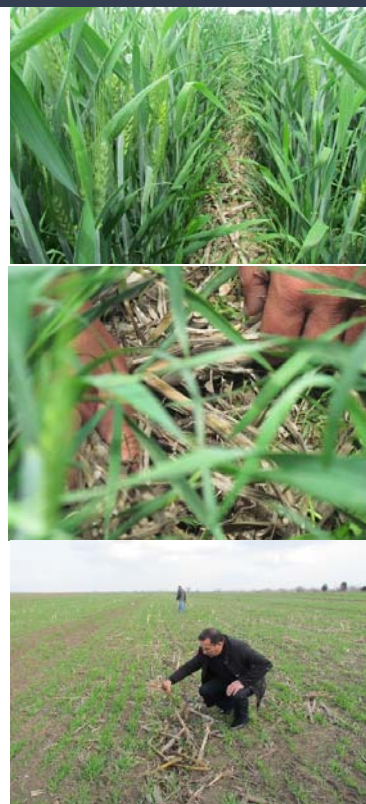
Sustainable land management

Some solutions to prevent erosion and improve soils fertility

Direct seeding



Soil mulching



Crop rotation



- Erosion control
- Improve soil fertility

Source:
A. Nurbekov,
ICARDA

Sustainable land management – Land use efficiency with different crop rotations: can be increased by up to 100%

Farm 1																																								
2011										2012										2013																				
M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D							
1	Corn								Winter wheat								Mungbean				Field pea				Corn								Winter wheat							
Farm 2 farmers' practice																																								
2011										2012										2013																				
M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D							
2		Soybean								Winter wheat								Fallow								Sorghum				Fallow										
Farm 3																																								
2011										2012										2013																				
M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D							
3	Sorghum								Winter wheat								Bersim				Winter barley								Soybean				Field pea							

4? cereals
2 legumes

2 cereals
1 legumes

3 cereals
3 legumes

13

4? cereals
2 legumes

2 cereals
1 legumes

3 cereals
3 legumes

Sustainable land management

Dynamic nature of salinity can cause complete loss of winter wheat crop



Two new winter wheat varieties in Uzbekistan-2015

Tolerant to salinity and frost, Grain yield potential 6.3 t/ha on medium saline field



Sustainable land management



A GLOBAL INITIATIVE FOR SUSTAINABLE LAND MANAGEMENT



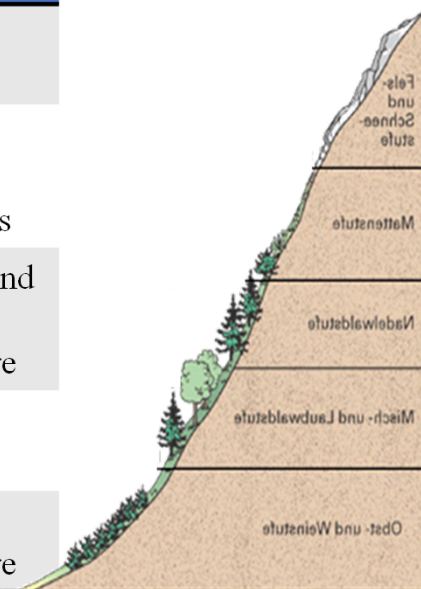
The Global Initiative “The Economics of Land Degradation” (ELD)

Initiated in 2010 by:

- the United Nations Convention to Combat Desertification,
- Government of Germany,
- Korean Forest Service, and
- European Commission.

Purpose: to provide economically sound approaches to facilitate solutions for the progressing problem of land degradation.

Country	Ecosystem
Kyrgyzstan	highland pastures
Tajikistan	foothills and low mountains
Kazakhstan	forestry and rainfed agriculture
Turkmenistan	lowland pastures
Uzbekistan	Irrigated agriculture



Source:
N. Nishanov,
ICARDA

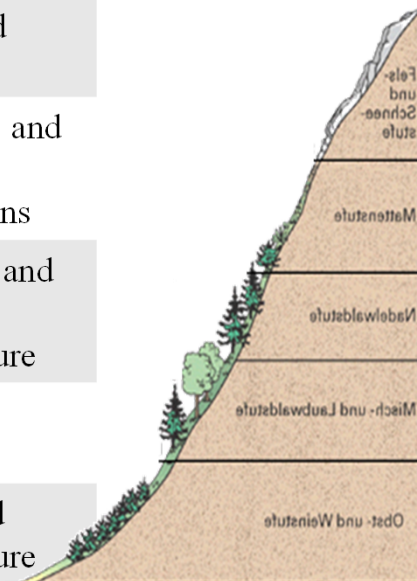
Sustainable land management



A GLOBAL INITIATIVE FOR SUSTAINABLE LAND MANAGEMENT



Country	Ecosystem	Results / Interventions (Preliminary)
Kyrgyzstan –	highland pastures	Introduction of sustainable rangeland utilization, mitigation of grazing pressure and rehabilitation of pasturelands
Tajikistan	foothills and low mountains	Application of no-till in irrigated agriculture, improved land use (intensive gardens), and rangeland improvement (+protection against natural disasters)
Kazakhstan	forestry and rainfed agriculture	Increased utilization of ecosystem services in desert forests
Turkmenistan	lowland pastures	Development of year-round rangeland plant compositions Introduction of perennial and annual grasses; Pasture rotation.
Uzbekistan	Irrigated agriculture	Introduction of advanced crop production methods: Leave mulch on fields; introduce crop rotation, plant forest belts around fields



Source: N. Nishanov, ICARDA

Capacity building



Capacity building

Farmers' Field Day
Karakalpakstan, Uzbekistan



Sugd, Tajikistan



Farmers' Training



Sustainable land management through knowledge management

- 40+ print materials
- 30+ short videos – aired on Kazakhstan, Tajikistan, Uzbekistan TV channels;
- Video classes on climate change, making of compost;
- Uploaded on cacilm.org;
- Promoted through Facebook & YouTube



www.cacilm.org	2014-15	2016
Website Visits	3,463	1,947
Total Page Views	19,714	6,475
icarda.org Sessions	5,304	2,908
Uploaded documents	75	132

Youtube CACILM	
Number of Posts	39
Number of Views	29,591

https://www.facebook.com/cacilm.org (since 24.11.14)	
Number of Posts	89
Followers	854
Total Reach (The number of people who saw any activity from the page including posts, posts by other people, page like ads, mention and check-ins)	19 38,986

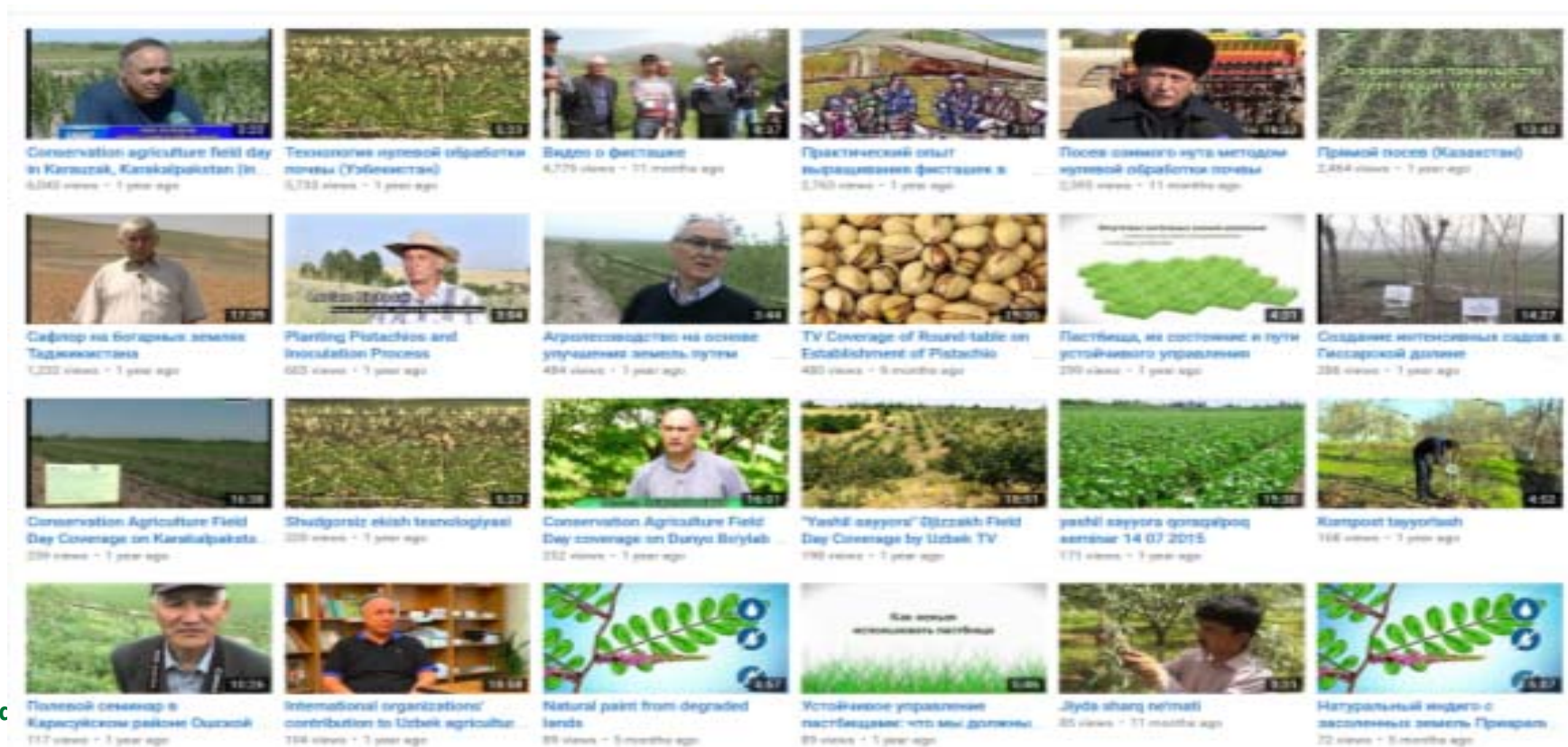
Sustainable land management by sharing knowledge

Sharing knowledge with stakeholders

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Sustainable land management

Summary

- Sustainable land management in relation to food security
- Establishing land use pattern and cropping patterns promoting soil health
- Out-scaling land-friendly innovations while maximizing land productivity
- Strengthening institutional and human resource capacities
- Increasing investment in research for development



Acknowledgements

- Governments of Central Asian countries – national research institutions, NGOs, CBOs, Private Sector, Farmers' organizations, Communities, Farmers, and Individuals
- CGIAR Centers – Bioversity, CIMMYT, ICARDA, IFRRI, IWMI
- Non-CGIAR institutions: ICBA, WorldVeg, Michigan State University, Bonn University and others
- Donor organizations: WB, ADB, IDB, BMZ/GIZ, EU, FAO, GEF, IFAD, Russian Federation, Turkish Government, UNDP, USAID, and others
- Others

Sustainable land management



“Earth provides enough to satisfy every man's needs, but not every man's greed.”

— [Mahatma Gandhi](#)