

Multipurpose Use of Marginal Lands and Water (crop diversification, agroforestry, pasture-livestock production system) under saline environment



28 August 2014, Fergana , Uzbekistan

Main Areas of Research Work in CAC region by ICBA

EVALUATION OF SALT-TOLERANT & DROUGHT TOLERANT FORAGES, FIELD CROPS, MEDICINAL , AROMATIC PLANTS -

1. Total : 102 improved lines of sorghum and pearl millet; 2 varieties of alfalfa; halophytes fodder shrubs and trees; fodder beet; cow pea; safflower; quinoa; barley; pigeon pea; sesbania; forage perennial grasses; legumes and others
2. Small knowledge alliances were created around each of the bright spot farms for dissemination of best bioscience practices and seed multiplication of ICBA germplasm ; The total number of farmers in the knowledge alliance was 22 (11 bright spot farms and 11 'potential bright spots). The number of satellite farms has risen to 42



NARS countries: **Uzbekistan** (6 sites); **Kazakhstan** (2 sites); **Turkmenistan** (2 sites); **Azerbaijan** (1) ;

Main Achievements:

- International collection nursery were established: more than 78 **improved lines** and varieties along with local collection
- **30%** higher dry fodder and **25%** consistently higher yield with superior quality and disease resistance over the local checks
- **HASHAKI 1** variety was developed from self-pollinated population line HHVBC Tall from ICRISAT was recognized promising by SVTC in Uzbekistan
 - Early maturing cultivar (**64-72 days**):
 - Green biomass – **38.0 - 45.0 t/ha**;
 - Grain yield- **3.0 t/ha**.



Using halophytic plants to improve agricultural production and environmental quality in arid and semi-arid regions of Central Asia (PEER Project)

- Feasibility of use of non-conventional water sources (hot artesian saline ground water and mineralized lake water) to grow halophytes and salt tolerant underutilized crops on marginal soils to produce biomass, tubers, edible roots, medicinal raw material; and oil crops;
- Livestock forage potential of halophytes and salt tolerant crops
- livestock feeding system & diets for small desert ruminants available;
- 8 legumes tolerant to salinity levels ranging from 8.0 to 23.2 dS/m high quality protein for multi-purpose use (diversification of human diets/ nutrition, commercial compounds & environmental quality)



Cow pea



Licorice

Nutritional value of some halophytes

Plants	Place of sampling	Ash. % DM	Crude protein. %	Crude cellulose. %	Crude fat. %
<i>Climacoptera lanata</i>	Farmer trial	31.60 ± 0.65	5.02±0.04	17.26±0.06	1.26±0.06
<i>Atriplex nitens</i>	Farmer trial	23.95 ± 1.69	13.83±0.17	15.01±0.04	5.06±0.08
<i>Salicornia europaea</i>	Solonchak	46.55 ± 6.97	6.79±0.17	11.99±0.24	4.63±0.18
<i>Suaeda paradoxa</i>	Farmer trial	26.03 ± 0.60	12.17±0.14	18.96±0.21	4.76±0.11
<i>Kochia scoparia</i>	Farmer trial	15.69 ± 0.08	12.68±0.20	19.04±0.17	4.21±0.16
<i>Salsola sclerantha</i>	Farmer trial	23.93 ± 0.45	7.62±0.17	20.54±0.23	0.49±0.03
Pearl millet "Hashaki-1" (hay)	Cultivated in saline lands	7.9	13.6	25.8	2.1
Maize "Uzbekistan 100" (hay)	Cultivated in saline lands	10.42	5.12	31.08	2.1



Artesian well; water for irrigation



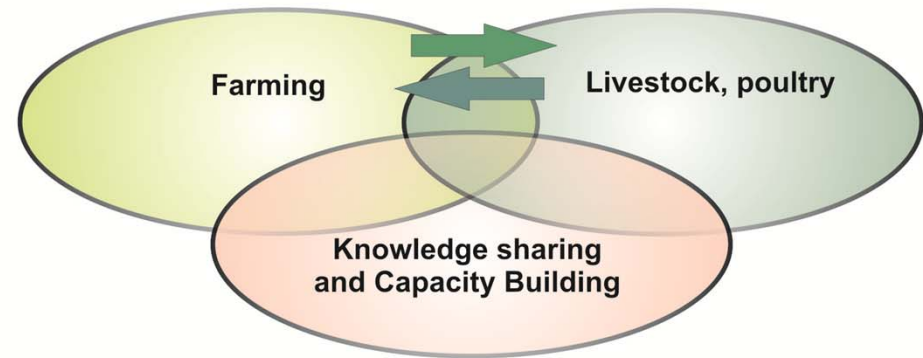
Kochia scoparia, *Salsola sclerantha*, *Climacoptera lanata*, *Suaeda paradoxa*, *Atriplex nitens*, licorice are used as **adds to green fodder** for cows, sheep and goats in the farm.

Improving the productive use of marginal lands in irrigated farming and pastoral systems (through creation of mini-multiprofiles cooperatives)



Marginal Environment Management

Crops-Livestock Diversification based System



CORE PROBLEMS

1. Marginal land/water resources, salinity
2. Low farm and livestock productivity
3. Low income
4. Limited access to appropriate crop varieties and animal species
5. Lack of knowledge of best water management, pasture management and biosaline agriculture

Project Work Packages

WP 1

WP 2

WP 3

WP 4

WP 5

Outcomes of the Project

1. Effective use of marginal resources, productivity of lands increased
2. Fodder production increased, livestock productivity increased
3. Yield losses reduced, family incomes increased
4. Crop diversification, introduction of salt-tolerant plants into farming, sustainability of S&PM based livestock system increased
5. Capacity building and awareness increased, dissemination of salt-tolerant crops, pasture management and effective water management technologies

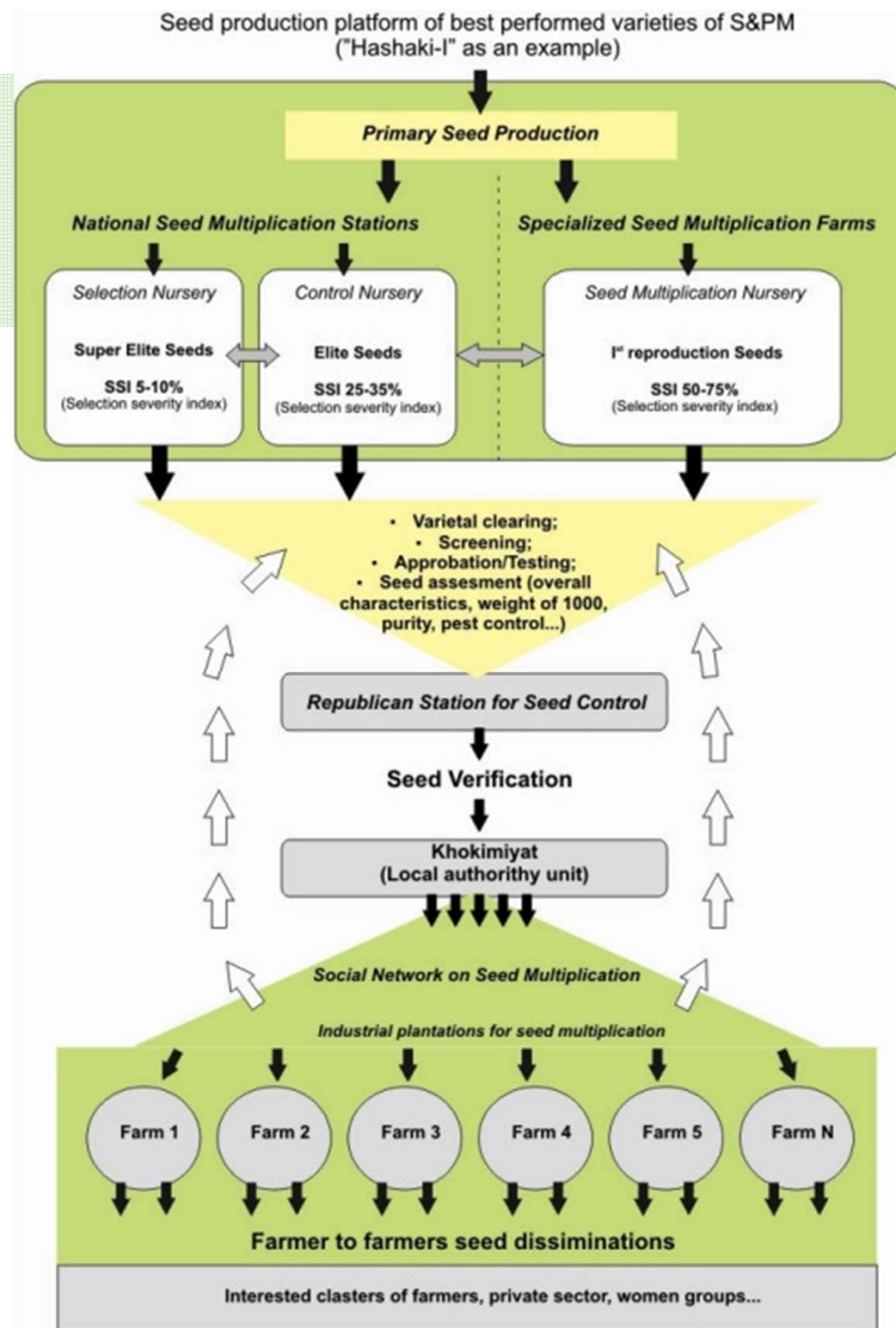
Marketing communications
Marketable products
Livelihood improved

Small incentive Groups



SEED PRODUCTION PLATFORM of neglected and underutilized crops (ICBA & ICARDA)

- 1), Was started at Kegeli specialized Farm by Karakalpakstan Branch of Uzbek Corn Station;
- 2) In Shotrtanbay at Karakalpakstan Branch of Institute of Rice, Nukus region
- 3) Korabuga , Karauzyak region
- 4) Kazalinsk, Kyzylorda *northern Kazakhstan , Institute of Rice; in Almata region; Abay Farm;
- 5) Gafurov Farm (Tajikistan)



Current Projects and Future activities:

- **Currently ICBA in the regions working on implementation of :**
- USAID/PEER Project (2012-2014)
- ICBA/ICARDA/ICRISAT SM & PM Project (2012-2014)
- Food Security Project (Kyrgyzstan, Azerbaijan, Russia and Uzbekistan)- 2014-2015
- **UNDP/GEF-5/ICBA Project (2014-2018)**
- **National Grant (Climate change Strategy Adaptation on Water and Land Use in Zarafshan River Basin (2012-2015))**

Kazakhstan:

- 1. «Подбор перспективных кормовых культур для короткоротационных севооборота при дождевании на низкопродуктивных землях»;**
- 2. «Диверсификация и подбор кормовых, зерно-бобовых и других культур в рисовом севообороте на маргинальных землях Казахстанского Приаралья»**

DS CRP1.1. Marginal Lands Activities and Seed Production Platform

Individual Grants (WB through ECSF) with Russian partners

SM &PM based system (pipeline Proposal) –under preparation

Promotion of biosaline technologies in marginal lands towards food security and environmental stability

Main expected results/Milestones:

- 1,5 year-
 - Inventory and synthesis of previous experiences completed
 - Baseline researches (soil, water quality and botanic investigations) in project areas implemented
 - SWOT-analysis implemented as a result of baseline data surveys
 - Most valuable crops, products for processing and most appropriate agricultural technologies evaluated and their cost assessed
 - Strategic innovation platform for biosaline agriculture and land/water management in marginal areas established; package of appropriate agro-technologies completed and published
 - Round tables and meetings with local communities and authorities conducted; and public-private partnerships established for efficient implementation of biosaline technologies
- 2 year-
 - Trainings /workshops for local administration and farmers on biosaline technologies in marginal lands conducted;
 - Project areas (at 5 farms at least) collected and established;
 - Various appropriate biosaline technologies tested and adapted.
- 3rd year –
 - Spreading of areas used biosaline technologies in the region;
 - Increasing of land productivity (crop yield, fodder, improving of wellbeing of the local people;
 - ...
- **10th =15 Years –**
 - Sustainable marginal resources management...

CAPACITY BUILDING

Workshops, Training courses, Field Days since 2002

More than 350 participants including women groups



ICBA-CAC jointly with Uzbek Research Institute of Desert Ecology and Karakul Sheep Breeding demonstrated to farmers the achievements and publications regard utilization of halophytes and salt tolerant crops



Participants of the training course May, Tashkent 2006



www.biosaline.org



ICBA, Dubai, UAE
A unique Center of Excellence looking at Agriculture for Tomorrow