RESEARCH
PROGRAM ON
Dryland Systems

CGIAR

Central Asia Flagship
2015 Plan of Work and Budget

Revised: June 2015

*Food security and better livelihoods
for rural dryland communities*

Table of Contents

Table 1. Central Asia Flagship – IDOs

Level	Level of organization within the CRP	Description of planned key activities at each level of internal organization	Expected results of planned key activities	Planned Budget ($ 000s)
4	Central Asia	**Agro-pastoral system interventions** (testing, piloting and scaling up): W1&2: Aral Sea Region (Turkmenistan, Uzbekistan and Kazakhstan); W3/Bil: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan **Rainfed System interventions** (testing, piloting and scaling up): W3/Bil: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan **Irrigated Crop Systems interventions** (testing, piloting and scaling up): W1&2: Fergana Valley (Kyrgyzstan, Tajikistan and Uzbekistan); W3/Bil: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan **Collaboration with other CRPs:** WLE (water management)	**Progress towards CRP IDOs and indicators of progress** **IDO1** • 10% increase in productivity of winter wheat, potato, mung bean, chickpea, forages maintained by establishing a functional seed system platform and access to quality planting material of varieties in the field sites. (2015) • 10% Increase in livestock production performance achieved through participatory planning of interventions to increase feed production and value chain analysis in the field sites. (2015) **IDO2** • 300 households increase their incomes through adoption of innovative technologies by farmers heading those households in the field site. (2015) **IDO3** • 170 households improve their dietary scores in the field sites through better access and availability of quality wheat, mung bean, chickpea, potato and other crops. (2015) **IDO4** • 10% increase in water use efficiency of crops through innovative technologies in irrigation and farming practices in the field site. (2015) **IDO5** • 220 households improve their vital activity through enhancing their leadership skills in participatory planning and decision-making within their community-based interventions. (2015) **IDO6** • At least three innovation platforms established within the action Sites for multi-stakeholder dialogue to address socio-economic, cultural, management and policy issues at farm/community level and congruent decision and participatory planning of interventions for development. (2015) • 10% of farmers, rural advisory services agents, agronomists, and representatives of local agricultural education and research institutions improve their understanding of Sustainable Land Management (SLM) practices through continued facilitation of dissemination (demo-sites) of SLM technologies and approaches. (2015)	3,142.558

Table 2. Central Asia - Cluster of Activities

Please note:

- Blue indicates capacity development activities
- Orange indicates gender-targeted activities

Level	Level of organization within the CRP	Description of planned key activities at each level of internal organization	Expected results of planned key activities	Planned Budget ($ 000s)
4.1	Research Support	Local Partners meetings, research site coordination, support to cross-cutting issues and to W3/Bilateral projects **Partnership:** **CRP-DS CG Centres:** ICARDA, IWMI, Bioversity **NGOs/CBOs:** 12 **NARS:** 18 **Government Department:** 2 **Academia:** 3 **International Center (Non-CG):** 3 **CG Scientists:** 22	Research activities, partner and interdisciplinary research workshops, and reports coordinated and reported on time. Cross-learning events over partner centres and sites. Joint work plans integrating activities by diverse group of partners developed and their implementation monitored. Data/information/tool sharing and joint evaluation and monitoring of progress facilitated. Experience sharing, capacity building on integrated systems analysis, research design and modelling, innovative platform development and gender analysis.	243.000
4.2	System Research: Agro-pastoral system interventions (testing, piloting and scaling up)	**Location:** **W1&2:** Aral Sea Region (Turkmenistan, Uzbekistan and Kazakhstan); **W3/Bil:** Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan **General objective:** To increase production stability and social equity of intensive rainfed farming systems in Aral Sea region and reserve/restore agriculture-induced land and water degradation through promoting context-	**Outputs in 6 months:** **(ICARDA-1)** Long term weather data gathered, last ten year monthly average climate data calculated and used to plot Walter graphs (dataset and maps); Object-based agricultural land use data using Landsat images (dataset and maps); Distance and density of the agricultural infrastructure will be calculated for each crop field and given weightage per criteria in order to find a suitability level of crop fields (report) **(ICARDA-2)** List of agencies involved in seed chain of crops prepared (report); **(ICARDA-3)** 2 on-farm demonstration (15 ha) established (report); Identify alternative crops for double cropping under no-till (report); 1 field day for 50 participants (20% female) on spring crop planting under no-till organized (report); **(ICARDA-4)** Review and assess reports and organize seed production of agricultural crops (report); **(IWMI-5)** Trial on assessing impact of	1,254.732

relevant SLM practices, technological development platforms and inclusive food value chains.

Specific objectives:
To improve understanding of strengths, opportunities and weaknesses, constraints of existing seed systems (including social systems and gender dynamics) with respects to seed needs by the transition of current intensive rainfed crop production systems to more conservation; To identify - jointly with multiple stakeholders –gendered technical, management, and capacity building options for improving seed systems towards enhancing the availability, stability of seed/germplasm resources and equal accessibility to qualified seeds/germplasm. The focus will be major annual crops' seeds and fruit trees' planting materials, as well as improved income for female and male farmers who produce seeds/germplasm; To identify in a gender-responsive manner crop and tree varieties best fit to conservation-oriented management of intensive rainfed farms (e.g. agroforestry, cost-effective and farmer-motivated multi-cropping practices) for improving and stabilizing farm productivity and incomes, and conserving soil, water and local seed/germplasm resources; To increase the productivity of the livestock component and its synergistic links to other components of the irrigated farming landscape through applying context-relevant gendered

conservation agriculture on WUE is established (report); **(ICARDA-6)** Networking with national partners and policy makers (contact list established with 30 participants from 10 institutions) to develop a basis for institutional support for long-term salinity management strategies (gender-disaggregated report); **(ICARDA-7)** Review on successes and failures of feed production on saline land in the Aral Sea Basin, Uzbekistan (2015); At least 10 households engaged in testing forage options for saline lands in Karabuga village and neighbouring villages (2015); **(ICARDA-8)** Field-tested toolkit for rapid small-ruminant value chain analysis (VCA) in SR VCA in Uzbekistan (Central Asia) available for other institutions; **(ICARDA-9)** None; **(ICARDA-10)** One baseline survey (Gender disaggregated) template developed (template);

Outputs in 12 months:
(ICARDA-1) 1 Fully-calibrated model for different wheat cultivars (model); A map of evapotranspiration losses from agro-pastoral lands of Arab Sea Basin highlighting hot spots; (2) Basic, functional DSSAT crop model for wheat and barley crops under conservation agriculture practices using existing data from previous ICARDA projects for estimate benefits in terms of soil-water conservation and improvement in soil health **(ICARDA-2)** 1 stakeholders workshop on seed system, involving at least 50 representatives organized with at least 10% women and 10% youth participants (report); List of available infrastructures and additional requirements for functional seed systems prepared (report); 1 training seminar (20 farmers, 20% female) conducted on seed multiplication of dual purpose crops and fodder shrubs at Karabuga Farm (gender-disaggregated report); **(ICARDA-3)** Evaluation of current status of cropping system (report); 1 assessment of the economic implications of introduced salt-tolerant and drought resistant crops (report); 2 on farm sites established in Qorao'zak district completed (report); Data on biomass, soil characteristics etc. collected (dataset); **(ICARDA-4)** Preliminary assessment of seed production of agricultural crops (report); 1 training course for 30 participants (20% female) on seed production of agricultural crops under no-till organized (report); **(IWMI-5)** Farmer field day organized for 40 farmers (20% female) (report); Analysis of the family budgets in degraded areas (report); **(ICARDA-6)** Development of field-based management strategies within the broader regional salinity management strategy developed in cooperation with the CRP WLE (report); 1 report on "research for development" vision for Aral Sea Basin; Improved gender aggregated data for communities living in the Aral Sea Basin and expected impact of interventions on salinity management and marginal lands (dataset); **(ICARDA-7)** Report on survey of feeding systems in 8 target villages (2015); At least two gender-sensitive training courses (50 persons) on utilization

technical/management options (e.g. alternative regulation of herd-rangeland management); To identify major bottlenecks/challenges of meat value chains and relevant (incl. gender) technical, institutional interventions for improving the value chain performance; To achieve widespread understanding and application of SLM practices through continued facilitation of dissemination (demo-sites) of SLM technologies and approaches through supporting existing agricultural service systems with newly accessible gender-responsive technological, system-based knowledge, data and tools, together with the development of management systems for transferring innovative technologies to local organizations (e.g. Water Users' Association -WUA).

Methods:
Regional-level seed systems analysis in linking to farming livelihood systems (gender-sensitive); GIS-based land degradation and/or restoration assessment; Spatially explicit context-option matrix approach applied for seed management and SLM for reversing land degradation; Multi-level surveys for assessing seed needs; Bio-economic modelling; Meat value chain analysis and modelling; Participatory technology development methods

Gender dimension:

Roles and responsibilities of men and women in livestock, tree and fruit,

and adoption of biosaline forage production from saline environments conducted (2015); Handbook on forage potential and nutritional characteristics of non-conventional forage crops prepared (2015); At least 2 promising options for feed production in Karabuga and neighbouring village with interested farmers identified, tested and evaluated (2015); **(ICARDA-8)** 1 qualitative value chain analysis (VCA), gender disaggregated, for the action site, including: marketing channels fully understood and bottlenecks addressed through gender sensitive intervention plans (report); Report on current practices and flock performance for 9 target villages (2015); **(ICARDA-9)**; At least 2 improved practices tested and evaluated with interested livestock keepers at the action site (report); Livestock keepers (total of 10 male herders) at one action site engaged in the activities (report); HH members' roles and responsibilities in livestock related activities translated in targeting intervention and trainings (report); **(ICARDA-10)** 1 gender-disaggregated database established for agropastoral system in selected research site (database);

Outputs in 12 months (W3/Bil):
(ICARDA-34) Web database of collected SLM published in English and Russian on www.cacilm.org (2015); 1 Educational and Promotional video infographics about selected SLM published on www.cacilm.org (2015); 1 National level similarity/suitability map completed for selected SLM (2015); Training for 8 national staff (30% women) on analytical tools (2015); At least 5 farmer field-days (30% women) organized; **(ICARDA-35)** 1 Recommendation for Policy Makers on better land use; 3 Publications (national and regional study); 5 Surveys prepared; 1 Stakeholders map prepared; 2 National country reports on cost-benefit analysis with recommendations; 1 Publications with infographics; 1 training-workshops (inception and final) reported; **(ICARDA-A)** At least 200 improved germplasm of different crops (cereals, legumes, vegetables, potato, fruit trees, forages) evaluated for stress (salinity, frost, heat, drought and diseases) tolerance (2015); 1 training courses organized for 10 young researchers (80% male, 20% female) on scientific management of experiments (2015); 2 farmers field days organized to demonstrate performance of stress tolerant varieties of crops (2015); 20 improved varieties of different crops superior to the locally grown varieties identified (2015); At least 20 farmers (2 women) better informed about new varieties through field evaluation and demonstration trials and gained information on relative performance of varieties(2015); **(ICARDA-B)** 1 Training for university students (at least 4 women) on state of the art tools (2015); 1 Training for farmers to manage agriculture production on marginal lands (2015); Training for local authorities for marginal lands management at mesoscale (2015); **(ICARDA-C)**

| | | mung bean, forage crops, seeds and conservation related activities translated in gender-responsive interventions, involvement in farm trials, stakeholder platforms and networks, and training sessions | Conjunctive water management strategies for dryland ecosystems of central Asia documented (2015); Calibrated and validated SWAP model for conjunctive water management strategies (2015); 1 Training for university students on state of the art tools (2015); 1 Training for farmers to manage surface and drainage water (2015); 1 Training for local authorities on marginal lands management at mesoscale (2015); Role of women in managing irrigation and drainage systems documented (2015); Areas where women can participate actively for improving the water productivity under saline environment documented (2015); **(ICARDA-E)** **Sogd Province, Tajikistan:** Goat meat value chains assessed and marketing channels fully understood and bottlenecks addressed through gender sensitive intervention plans for the three target communities in Sogd Province, Tajikistan (2015); At least 10 pilot livestock keepers in the target communities engaged in testing and adopting improved herd management practices in Sogd Province,Tajikistan (2015); Report on traditional goat milk processing methods in three target communities in Sogd Province including entry points for low-cost improvements (2015); three women groups involved in improved goat milk processing (report, 2015); **Aral Sea and Sogd Province:** Logframe, results pathway and work-plan for the rangeland land tenure study established with special emphasis on women's role in decision making processes (report, 2015); Regulations for access to rangelands (private, pastoral and forest) documented (2015); First set of maps on status and utilization produced for target villages and communities (2015); Gender-disaggregated report on rangeland land tenure changes and access to rangeland produced (2015); Toolkit for scaling rangeland monitoring developed (2016); at least 50 Livestock keepers engaged in designing and adopting rangeland utilization and rehabilitation strategies (2015); **(ICARDA-I)** At least 2 demonstration established (2015); Review and assess report and identify alternative crops for double cropping under no-till (2015); 1 report on assessing current status of seed production of forage crops (2015); 1 report on assessing the roles of men and women in all farm and HH activities (2015); **(ICARDA-L)** 1 document on expert's view produced on overall status of seed system (2015); Strength and weakness of the seed system identified and reported (2015); List of agencies involved in seed chain of crops identified (2015); Varietal catalogue developed (2015); Varietal catalogue produced and distributed to at least 500 (50 women) farmers (2015); **(ICARDA-M)** 1 report on gender-disaggregated data set analysis of agopastoral system in selected research site (2015);

Outcomes:
(ICARDA-1) Filling of knowledge gap of Uzbek researchers on difference between | |

actual, achievable and potential yields of different popular crops under local climatic and landscape conditions; 10% saving of water for 20-30 farmers in the participating WUA by means of higher WUE; Development of remote sensing-based maps of evapotranspiration for Identification of hot spots having high evapotranspiration losses to help manage them **(ICARDA-2)** Prevalent seed system analyzed and requirements for a functional seed system identified; At least 20 farmers (men and women) strengthened their capacity in sorghum , pearl millet, legumes, triticale and fodder perennial shrubs seed production (report); **(ICARDA-3)** 10 farmers' awareness on conservation agriculture increased (gender-disaggregated report); Capacity of national partners and farmers (80 total, 20% female) will be strengthened through short and long term training measures and full involvement in the design and implementation of the project activities (gender-disaggregated report); **(ICARDA-4)** 10 farmers' awareness on seed supply and on agricultural crops under no-till increased (report); **(IWMI-5)** Farmers (40 total, 20% female) will improve their knowledge on irrigation of salt tolerant and drought resistant crops (gender-disaggregated report); National staff (40 total, 20% female) improve their knowledge on WUE of new crops (report); **(ICARDA-6)** Policy makers in the region increase interaction with CRP DS on salinity management (report); **(ICARDA-7)** None; **(ICARDA-8)** None; **(ICARDA-9)** None; **(ICARDA-10)** None;

Outcomes (W3/Bil):
(ICARDA-34) Increased awareness in the region on SLM and web-based knowledge platform measured through number of attendees (34 in total) and web analytics (target website visitors 100/month), respectively (2015) **(ICARDA-35)** Sound knowledge and Information about the Economics of Land Degradation and Sustainable Land Management Practices for Public and Private Decision Makers (2015); **(ICARDA-A)** At least 80 farmers participated in 2 field days and learned about newly released stress tolerant varieties of different crops (2015); **(ICARDA-B)** The potential of the selected technologies has been acknowledged by the policy makers and is adopted by at least 2 farmers (2015); Tools, methods, processes and capacity of NARS to create and customize improved resilience options to local circumstances across scaling domains improved and at least 50 women will get benefit (2015); **(ICARDA-C)** Involvement of women in managing canal water and groundwater in an optimum way and their role has been accepted by the policy makers and relevant authorities (2015); **(ICARDA-E)** Capacity of the Tajik national partner institute for conducting value chain analysis increased (2015); **(ICARDA-I)** 25 farmers adopted introduced technology on 10 ha with 2 crops (2015); Forage crops seeds growers network established and reported (2015);

| 4.3 | System Research: Rainfed crop System interventions (testing, piloting and scaling up) | **Location:** **W3/Bil**: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

General objective: To attain a system-level integrated, systemic understanding of application of Sustainable Land Management (SLM) Practices and support decision-making promoting SLM.

Specific objectives: To synthesize current knowledge and generate SLM practices; to package and disseminate knowledge in SLM practices in coping with diverse types of stakeholders; and to use the synthesized and generated knowledge to support policy dialogue towards enhancing SLM adoption at scale.
Methods: Context similarity mapping; SLM suitability mapping; SLM database cataloguing; web-based knowledge platform; trainings (formal and field-based); multi-media knowledge disseminations; multi-stakeholder workshop at different levels.

Gender dimension: Female researchers and farmers targeted with capacity development actions. | **Outputs in 12 months (W3/Bil):** **(ICARDA-34)** 1 National level similarity/suitability map completed for selected SLM (2015); Training for 8 national staff (30% women) on analytical tools (2015); At least 5 farmer field-days (30% women) organized;

Outcomes (W3/Bil): **(ICARDA-34)** Increased awareness in the region on SLM and web-based knowledge platform measured through number of attendees (33 in total) and web analytics (target website visitors 100/month), respectively (2015); | 372.566 |
| 4.4 | System Research: Irrigated crop System interventions | **Location:** **W1&2:** Fergana Valley (Kyrgyzstan, Tajikistan and Uzbekistan); **W3/Bil:** Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan | **Outputs in 6 months:** **(ICARDA-1)** Field trials for mung bean and winter wheat designed, site selected, soil analysis conducted, and raised bed furrows prepared for mung bean trial (dataset and report); **(ICARDA-2)** Weather station network-based cropping and water advisory system for all three participating WUAs established (report); Survey | 1,272.260 |

| (testing, piloting and scaling up) | **General objective:** To improve food productivity, quality, profitability, stability and benefit-sharing equity of favorable irrigated farming systems in Central Asia, as well as minimize agriculture-driven negative impacts on natural resources through innovative changes in intensification-diversification practices and value chain management.

Specific objectives:
(1) To improve gender-differentiated understanding of strengths, opportunities and weaknesses, constraints of existing seed systems with respects to seed needs by irrigated crop production systems in Central Asia;
(2) To identify - jointly with multiple stakeholders - technical, management, and capacity building options for improving seed systems towards enhancing the availability, stability of seed/germplasm resources and equal accessibility to qualified seeds/germplasm. The focus will be major annual crops' seeds and fruit trees' planting materials, as well as improved income for female and male farmers who produce seeds/germplasm will be among the foci.;
(3) To identify crop and tree varieties best fit to integrated management of irrigated farms (e.g. multi-cropping, soil/water conservation practices) for improving and stabilizing farm | for 100 HH (70% women) in 3 villages (dataset and report); 1 Draft Paper on "Gender roles and implications for water management in agriculture"; **(ICARDA-3)** Experimental site selected (report); **(ICARDA-4)** Field day organized for 50 farmers and stakeholders (at least 10% women and 10% youth) organized to demonstrate high yielding wheat crop varieties and seed multiplication plots (report); **(ICARDA-5)** None; **(ICARDA-6)** None; **(Bioversity-7)** 30 Farmers (10 women and 20 men) selected for production of quality planting material of local fruit trees varieties (report**(IWMI-8)** 1 model of predicting of WUE for winter wheat; **(IWMI-9)** 1 International Conference and 1 National Conference presentations on CRP DS presented on institutional analysis of water resources management; Survey data collected for 3 Case-study pilot WUAs of Ferghana Valley; **(ICARDA-10)** Baseline study, including socio-economic, gender, youth, capacity building, extension aspects conducted in at least one Action Site covering 100 HHs (dataset and report); ToR to identify research niches to ensure a system approach (documentation); ToR for data collection for Comparative inventory of agronomic, socio-economic and institutional settings of farming systems agreed between local, national and regional partners; **(IWMI-11)** 6 months report including gender aspects of Water Use Efficiency at HH level in Toshloq district; **(ICARDA-12)** None; **(IWMI-13)** Field activities report;

Outputs in 12 months:
(ICARDA-1) 1 Mung bean trial completed with expected increased yield (10%), water productivity (20%), reduced cost of cultivation, water saving (20%) observed (report); Winter wheat trials implemented (report); Reveal gender sensitivity and responsiveness to currently applied and newly implemented technologies (report); **(ICARDA-2)** 2 International conference and 1 journal article will be submitted; 100 Handbooks for farmers on recommended land and water management practices to maximize WUE developed; 4 presentations at national or international conference; Report on irrigation advisory system potential and challenges; 100 Manuals for farmers on improving WUE for winter wheat and mungbean; Test and reveal gender sensitivity and responsiveness to currently applied and newly implemented technologies as well to current water resource uses and management within the households (report); **(ICARDA-3)** 1 early maturing variety of mung bean grown successfully, 2 yellow rust resistant winter wheat varieties planted (report); **(ICARDA-4)** 1 training course for 20 seed producers (10%women and 10% youth) organized (report); **(ICARDA-5)** Document prepared for seed storage system with the participation of at least 5 farmers (20% women and 20% youth); **(ICARDA-6)** At least 5 farmers (20% women and 20% youth) involved in production of high quality seed of mungbean (at least 2 ton) and winter wheat (at | |

productivity and incomes, and conserving soil, water and local seed/germplasm resources;
(4) To increase the productivity of the livestock component and its synergistic links to other components of the irrigated farming landscape through applying context-relevant technical/management options (e.g. improved feeding in winter, alternative rangeland management regulation);
(5) To identify major bottlenecks/challenges of meat value chains and relevant gendered technical, institutional interventions for improving the value chain performance;
(6) To achieve widespread understanding and application of SLM practices by the facilitation of dissemination (demo-sites) of SLM technologies and approaches through supporting existing agricultural service systems with newly accessible technological, gendered system-based management knowledge, data and tools (e.g. gender-mainstreaming), together with the development of management systems for transferring innovative technologies to local organizations (e.g. Water Users' Association -WUA).

Methods:
(1) Regional-level gendered seed systems analysis linked to farming livelihood systems
(2) Spatially explicit context-option matrix approach applied for seed/germplasm management and

least 50 ton) (report); **(Bioversity-7)** At least 20 farmers (20% women) are trained and involved in production of quality planting material of fruit trees (report); **(IWMI-8)** 2 farmer field days targeting 100 farmers (at least 25% women) organized (report); **(IWMI-9)** Working paper on impact of establishing WUAs on WUE; **(ICARDA-10)** Gender disaggregated database established for research site in Kyrgyzstan part of Fergana Valley action site (dataset); Gender disaggregated database established for research site in Tajikistan part of Fergana Valley (dataset); **(IWMI-11)** None; **(ICARDA-12)** 1 report on the economics of mung bean cultivation and gender impact of seed multiplication and marketing; **(IWMI-13)** 1 journal paper on water and energy productivity for double crops (submitted);
Outputs in 12 months (W3/Bil):

(IWMI – 1) Upscale and dissemination of generated knowledge (Guidelines, manuals and brochures) and experience in the region: Andijan, Ferghana, Samarqand Provinces of Uzbekistan, Andijan and Samarkand Agricultural Institutes (2015); Around 80 stakeholders participated in the teleconference between Andijan and Samarkand Provinces including 30 farmers, scientists and researchers (2015); **(ICARDA-34)** 1 book compilation of 90 promising SLM technologies both English and Russian (2015); Web database of collected SLM published in English and Russian on www.cacilm.org (2015); 2 Educational and Promotional video infographics about selected SLM published on www.cacilm.org (2015); 2 National level similarity/suitability map completed for selected SLM (2015); 1 Policy brief (2015); Training for 8 national staff (30% women) on analytical tools (2015); At least 5 farmer field-days (30% women) organized; **(ICARDA-35)** 3 Publications (national and regional study); 5 Surveys prepared; 3 National country reports on cost-benefit analysis with recommendations; 1 Publications with infographics; 1 training-workshops (inception and final) reported; **(ICARDA-A)** At least 50 improved germplasm of different crops (cereals, legumes, vegetables, potato, fruit trees, forages) evaluated for stress (salinity, frost, heat, drought and diseases) tolerance (2015); 1 farmers field days organized to demonstrate performance of stress tolerant varieties of crops (2015); 1 new crop rotation with two crops successfully demonstrated (2015); 1 training course organized for home gardeners on the role of vegetables in improved human nutrition (2015); **(ICARDA-B)** 1 Training for university students (at least 4 women) on state of the art tools (2015); 4 Training for farmers to manage agriculture production on marginal lands (2015); 9 Training for local authorities for marginal lands management at mesoscale (2015); **(ICARDA-C)** Conjunctive water management strategies for dryland ecosystems of central Asia under different options demonstrated through a field day/workshop with irrigation officials and

| | | SLM.
(3) Multi-level gendered surveys for assessing seed needs
(4) Bio-economic modeling
(4) Gendered value chain analysis and modeling
(6) Participatory technology development methods, equally involving men and women

Gender dimension: To identify the new allocation of labor within the various types of household, farm and water management as result of male migration in rural communities of Fergana Valley, Uzbekistan. | documented (2015); Calibrated and validated SWAP model for conjunctive water management strategies (2015); 1 Training for university students on state of the art tools (2015); 1 Training for farmers to manage surface and drainage water (2015); 9 Training for local authorities on marginal lands management at mesoscale (2015); Role of women in managing irrigation and drainage systems documented (2015); Areas where women can participate actively for improving the water productivity under saline environment documented (2015); **(ICARDA-D)** 2 Farmer field days targeting 200 farmers (60 women) (2015); 1 report on irrigation advisory system-potential and challenges (2015); Calibrated crop models 1 for wheat and 1 for cotton (2015); Report on filling of knowledge gap on difference between actual, achievable and potential yields of different popular cotton and 3-5 wheat cultivars under local climatic and landscape conditions (2015); **(ICARDA-F)** 1 manual on processing and using CORDEX climate change data and crop models for assessment of climate change impact on crop productivity published and disseminated (2015); Calibrated crop model for cotton and wheat conditions in Uzbekistan (2015) **(ICARDA-G)** At least 1 international conferences/proceedings (2015); Spatio-temporal dynamics of croplands and grasslands condition assessed (2015); **(ICARDA-H)** Development of the vegetation phenology products from 2000-2013 (2015); 1 field survey and ground truthing for classification and validation of land use and land cover (2015); Geospatial portal for data visualization and sharing (2015); At least 1 international conferences/proceedings (2015); 1 high impact journal article (2015); 6Web apps and data visualization tools (beta) for the managing the natural resources and land degradation established (2015); Technical Report on quantification of the spatio-temporal dynamics of land use, land cover, and productivity of croplands and grasslands (2015); ;**(ICARDA-I)** At least 2 demonstration established (2015); Review and assess report and identify alternative crops for double cropping under no-till (2015); 1 report on assessing current status of seed production of forage crops (2015); 1 report on assessing the roles of men and women in all farm and HH activities (2015); **(ICARDA-L)** 1 document on expert's view produced on overall status of seed system (2015); Strength and weakness of the seed system identified and reported (2015); List of agencies involved in seed chain of crops identified (2015); Varietal catalogue produced and distributed to at least 500 (50 women) farmers (2015); At least 1 2-wheel tractors and associated seeder for small farms procured to strengthen seed system facilities purchased (2015); 1 workshop on seed systems with at least 50 participants (5 women) organized (2015); Varietal catalogue produced and distributed to at least 250 (25 women) farmers (2015); **(ICARDA-M)** 1 gender-disaggregated database established for irrigated system in selected research site (2015); 1 report on | |

gender-disaggregated data set analysis of irrigated system in selected research site (2015);

Outcomes:
(ICARDA-1) WUAs and farmers' capacity development through organizing observation field days of on-farm demonstration of package of improved crop management practice (report); 2 WUAs adopt raised bed furrow irrigation method; (ICARDA-2) Filling of knowledge gap on difference between actual, achievable and potential yields of different popular crops under local climatic and landscape conditions (report); 20% saving of water and 15% increase in income for 50 farmers in the participating WUAs by means of higher WUE (report); knowledge and practical skills of local communities increased on improving and applying new water and energy efficiency raising and small scale gardening technologies (report); 25 farmers will start applying irrigation based on recommendation from irrigation advisory system (report); 50 farmers will improve their knowledge on irrigation of winter wheat, mungbean and potato (report); 6 WUAs will formalize informal institutions for improvement their operation as well as its governance operation (report); (ICARDA-3) None; (ICARDA-4) None; (ICARDA-5) None; (ICARDA-6) At least 5 Farmers successfully produced high quality seed of wheat (at least 50 ton) and mungbean (at least 2 ton) (report); Capacity of at least 20 farmers strengthened in seed production (report); (Bioversity-7) 20 Farmers' knowledge and skills increased (20% women) resulting in production of quality planting material of fruit trees adapted to water scarce environment of farming systems in Fergana (report); (IWMI-8) 50 farmers will improve their knowledge on irrigation of winter wheat, mungbean; (IWMI-9) Governance bodies (20% women members) of each pilot 3 WUAs are operational, aware on improved institutional interventions, and it contributes to improve water allocation and management; (ICARDA-10)None; (IWMI-11) WUA staff and water managers will improve their knowledge on gender specifics of current practices; (ICARDA-12) 20 Women introduced to mung beans as an alternative crop express increased levels of empowerment through greater income sources and access to employment opportunities (report); (IWMI-13) Policy makers will improve their knowledge on energy expenses for different crops and potential to reduce energy losses;

Outcomes (W3/Bil):
(IWMI – 1) Cost-effective irrigation practices and water management technology for increased water use efficiency are practiced by 30 potato farmers in Andijan, Ferghana and Samarkand provinces enhancing women's incomes (2015); Over

				40 farmers improved their knowledge in potato irrigation in Andijan and Ferghana Provinces (2015); **(ICARDA-34)** Increased awareness in the region on SLM and web-based knowledge platform measured through number of attendees (33 in total) and web analytics (target website visitors 100/month), respectively (2015) **(ICARDA-35)** Sound knowledge and Information about the Economics of Land Degradation and Sustainable Land Management Practices for Public and Private Decision Makers (2015); **ICARDA-A)** At least 55 farmers (5 women) participated in 2 field days and learned about newly released stress tolerant varieties of different crops (2015); **(ICARDA-B)** Tools, methods, processes and capacity of NARS to create and customize improved resilience options to local circumstances across scaling domains improved and at least 50 women will get benefit (2015); **(ICARDA-C)** Involvement of women in managing canal water and groundwater in an optimum way and their role has been accepted by the policy makers and relevant authorities (2015); **(ICARDA-D)** 10% water saving and 10% increase in income for farmers in the participating WUAs by means of higher WUE (2015); 25 farmers will start applying irrigation based on recommendation from irrigation advisory system (2015); 250 farmers will improve their knowledge on irrigation of winter wheat, mung bean and potato (2015); **(ICARDA-G)** At least 30 farmers participated in 1 field days and learned about newly released varieties of different crops (2015); At least 40 home gardeners learned about importance of vegetables in human nutrition (2015); **(ICARDA-H)** Improved knowledge base for the WUAs and institutions engagement in Geoinformatics science, technology and application (GeSTA) for better management of the integrated agro-ecosystems (2015); Strengthen the Geoinformatics capacity and geospatial database of the stakeholders through data exchange and technical back stopping and onsite demonstration (2015); 25 farmers adopted introduced technology on 10 ha with 2 crops (2015); Forage crops seeds growers network established and reported (2015); **(ICARDA-I)** 50 farmers adopted introduced technology on 30 ha with 3 crops (2015); Forage crops seeds growers network established and reported (2015).	

Table 3. Central Asia - Activities by Action Site

I. Aral Sea Region (Turkmenistan, Uzbekistan and Kazakhstan)

#	Short Title	Full Title	CG Center	Activity Leader	Other Scientists (CG)	Discovery	Proof of Concept	Pilot	Scaling Up	1	2	3	4	5	6	Budget
A					System sustainability enhancement											
1	Managing evapotranspiration (ICARDA-1)	Managing evapotranspiration to maximize WUE in the Aral Sea Basin, Uzbekistan	ICARDA	V.Nangia@cgiar.org				100%			50%		50%			40,000
2	Seed System Platform (ICARDA-2)	Establish a seed system platform compatible with existing agro-ecological environments to supply farmers with high quality seed and planting materials so as to improve livelihoods, food security and incomes of smallholders	ICARDA	r.c.sharma@cgiar.org		100%				50%	50%					20,000
3.1	Improve land use efficiency (ICARDA-3)	Improve land use efficiency through crop rotation under Conservation Agriculture in salt and drought affected areas of Karakalpakistan	ICARDA	A.Nurbekov@cgiar.org				100%		50%			50%			25,000
3.2	Seed Production (ICARDA-4)	Seed production of the salt tolerant and drought resistant promising agricultural crops using site-similarly mapping - to be linked with Breeding Programs	ICARDA	A.Nurbekov@cgiar.org				100%		50%			50%			25,000
3.3	Improving WUE at degraded land (IWMI-5)	Improving WUE at degraded land by double cropping using conservation agriculture	IWMI	A.Karimov@CGIAR.ORG				100%			50%		50%			26,000
4	Salinity management (ICARDA-6)	Salinity management (formerly: Improve the productivity of marginal lands in irrigated farming and pastoral systems)	ICARDA	B.Benli@cgiar.org			100%			40%			60%			45,000
B					System productivity improvement / System interactions (internal and external)											
5.1	Increased winter feed production (ICARDA-7)	Cluster: Increase livestock productivity while sustaining natural resource base.	ICBA under ICARDA	K.Toderich@cgiar.org				100%		40%	35%	20%		5%		24,000

#	Short Title	Full Title	CG Center	Activity Leader	Other Scientists (CG)	Discovery	Proof of Concept	Pilot	Scaling Up	1	2	3	4	5	6	Budget
		Increased winter feed production from arable land and hayfields														
5.2	Value Chain (Sheep and Goat meat) (ICARDA-8)	Cluster: Increase livestock productivity while sustaining natural resource base Complete qualitative (rapid) sheep and goat meat VC analysis in coordination with baseline survey and prioritize and implement interventions along the VC.	ICARDA	b.rischkowsky@cgiar.org				100%		20%	40%		10%	20%	10%	13,000
5.3	Management practices for improving herd productivity (ICARDA-9)	Cluster: Increase livestock productivity while sustaining natural resource base Design of an integrated package of improved management practices for improving herd productivity for smallholders	ICARDA	m.rekik@cgiar.org	b.rischkowsky@cgiar.org			100%		30%	40%		10%	20%		28,000
C		Socioeconomics and policy														
6	Innovation Platform (ICARDA-10)	Establishing Innovation Platform for multi-stakeholder process on fostering and improving resilience of the agro-pastoral livelihood systems	ICARDA	B.Dosov@cgiar.org				100%		30%	20%		10%	10%	30%	20,000
		TOTAL														266,000

II.   Fergana Valley (Kyrgyzstan, Tajikistan and Uzbekistan)

#	Short Title	Full Title	CG Center	Activity Leader	Other Scientists (CG)	Discovery	Proof of Concept	Pilot	Scaling Up	1	2	3	4	5	6	Total Budget
1	Performance of irrigation methods	Cluster: System productivity improvement Sub-Cluster: 1. Integrated land and water productivity improvement 1.1 Examine performance of conventional and raised bed wide furrow irrigation methods for wheat varieties and wheat-mung bean crop rotation options.	ICARDA	B.Benli@cgiar.org	Tulkun Yuldashev, Mariya Glazirina			100%			50%		50%			60,000
2	Performance of irrigation scheduling	Cluster: System productivity improvement Sub-Cluster: 1. Integrated land and water productivity improvement 1.2 Examine performance of conventional and ET based irrigation scheduling for wheat varieties and wheat-mungbean crop rotation options.	ICARDA	V.Nangia@cgiar.org	B.Benli@cgiar.org			100%			50%		50%			40,000
3	Interactions among variety and crop rotation options	Cluster: System productivity improvement Sub-Cluster: 1. Integrated land and water productivity improvement 1.3 Determine different factors interactions among variety and crop rotation options, tillage system, irrigation scheduling and irrigation methods	ICARDA	r.c.sharma@cgiar.org	R.Mavlyanova@cgiar.org			100%		50%	50%					25,000
4	Capacity Development to increase productivity	Cluster: System productivity improvement Sub-Cluster: 2. Establish a seed system platform compatible with existing agro-ecological environments to supply farmers with high quality seed and planting materials so as to improve livelihoods, food security and incomes of smallholders 2.1 Training of seed growers for production of quality chickpea and mung bean	ICARDA	r.c.sharma@cgiar.org	R.Mavlyanova@cgiar.org	100%				50%	50%					7,000

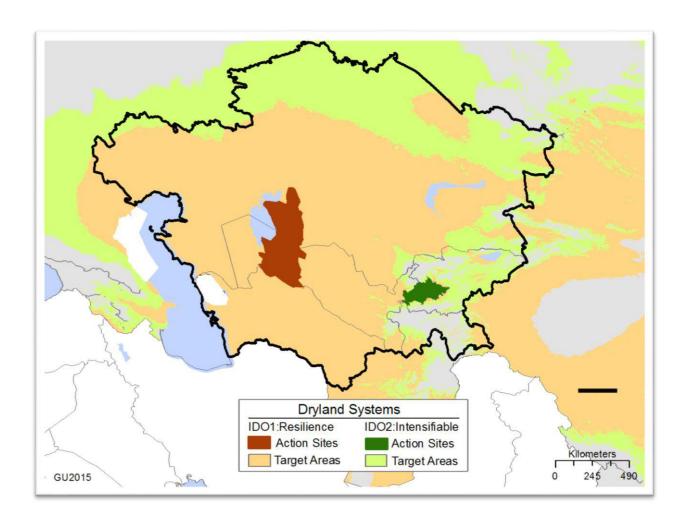| #	Short Title	Full Title	CG Center	Activity Leader	Other Scientists (CG)	Discovery	Proof of Concept	Pilot	Scaling Up	1	2	3	4	5	6	Total Budget
5	Seed storage system	Cluster: System productivity improvement Sub-Cluster: 2. Establish a seed system platform compatible with existing agro-ecological environments to supply farmers with high quality seed and planting materials so as to improve livelihoods, food security and incomes of smallholders 2.2 Establish farmers' participatory seed storage system for chickpea and mungbean	ICARDA	r.c.sharma@cgiar.org				100%		50%	50%					7,000
6	Support to farmers' production of quality seeds	Cluster: System productivity improvement Sub-Cluster: Establish a seed system platform compatible with existing agro-ecological environments to supply farmers with high quality seed and planting materials so as to improve livelihoods, food security and incomes of smallholders 2.3 Production of quality seed of new wheat, mung bean, barley, and chickpea varieties by the farmers	ICARDA	r.c.sharma@cgiar.org	R.Mavlyanova@cgiar.org				100%	25%	25%	25%			25%	6,000
7	Support to farmers' production of quality planting material	Cluster: System productivity improvement Sub-Cluster: Establish a seed system platform compatible with existing agro-ecological environments to supply farmers with high quality seed and planting materials so as to improve livelihoods, food security and incomes of smallholders 2.4 Production of quality planting material of local fruit tree varieties by the farmers	Bioversity	m.turdieva@cgiar.org					100%	25%	25%	25%			25%	48,600
8	Improved irrigation system	Cluster: System productivity improvement Sub-Cluster: Improved irrigation system/Growing wheat-mung bean 4.1 Improved irrigation system/Growing wheat-mung bean	IWMI	a.karimov@cgiar.org			100%				50%		50%			30,000

#	Short Title	Full Title	CG Center	Activity Leader	Other Scientists (CG)	Discovery	Proof of Concept	Pilot	Scaling Up	1	2	3	4	5	6	Total Budget
9	Enhancing Water User Associations role	Cluster: System Sustainability Enhancement Sub-Cluster: Enhancing WUA role in water allocation and management 5.1 Enhancing WUA role in water allocation and management via institutional interventions	IWMI	o.anarbekov@cgiar.org			100%				50%		50%			14,000
10	Innovation Platform	Cluster: Socio-economics and policy Sub-Cluster: Establish Innovation Platform for multi-stakeholder process on fostering sustainable intensification in Fergana Valley Action Site 6.1 Establish Innovation Platform for multi-stakeholder process on fostering sustainable intensification in Fergana Valley Action Site	ICARDA	b.dosov@cgiar.org			100%			10%	40%		10%	10%	30%	23,100
11	Gender study on household policy analysis	Cluster: Socio-economics and policy Sub-Cluster: Gender study on household level 7.1 Gender study on household policy analysis	IWMI	n.mukhamedova@cgiar.org			100%				50%		50%			7,000
12	Productive and profitable agricultural systems identification	Cluster: Socio-economics and policy Sub-Cluster: Identify the productive and profitable agricultural systems for the farmers. 8.1 Identify the productive and profitable agricultural systems for the farmers.	ICARDA	b.benli@cgiar.org		100%					45%		10%	45%		5,000
13	Water and energy productivity assessment	Cluster: System interactions (internal & external) Sub-Cluster: Assessment of water and energy productivity 9.1 Assessment of water and energy productivity.	IWMI	a.karimov@cgiar.org		100%					50%		50%			28,400
									TOTAL							301,000

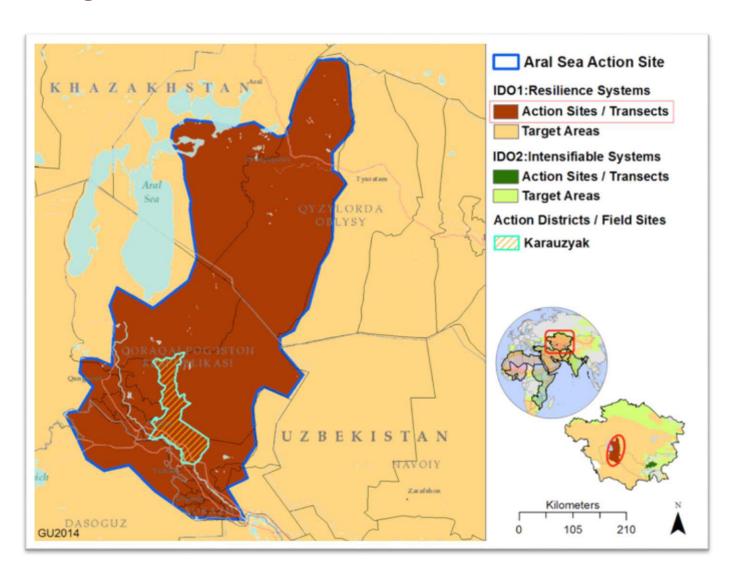## Table 4. Central Asia - Bilateral/W3 Projects X Cluster of Activities

ID	Lead Center	Project or Activity Title	From	To	Email	CA %	NAWA %	Countries % (equal)	2015 Budget to DS (MUSD)	Agro-Pastoral %	Rainfed %	Irrigated %
1	IWMI	Improved potato varieties and water management technologies to enhance water-use efficiency, resilience, cost effectiveness and productivity of smallholder farms in stress-prone Central Asian environments	Mar-12	Feb-15	A.Karimov@cgiar.org	100		Uzbekistan	0.005325	0	0	100
2	ICARDA	Integrated Crop-Livestock Conservation Agriculture for Sustainable Intensification of Cereal-based Systems in North Africa and Central Asia	Jan-13	Jan-16	H.BenSalem@cgiar.org	30	70	Algeria, Tunisia, Tajikistan	0.540966	80	0	20
34	ICARDA	Knowledge Management in CACILM II	Feb-13	Jan-16	A.Akramkhanov@cgiar.org	100		Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan	0.745131	25	50	25
35	ICARDA	An Assessment of the Economics of Land Degradation for Improved Land Management in Central Asia	Nov-14	Oct-15	R.Thomas@cgiar.org	100		Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan	0.484667	50	0	50
A	ICARDA	W3 Russian Funding- Identify and introduce stress-tolerant, high-yielding and improved quality varieties of cereals, legumes, potato, vegetable, horticultural and fodder crops through on-farm adaptive trials	Dec-12	Dec-16	r.c.sharma@cgiar.org	100		Tajikistan, Uzbekistan	0.139160	100	0	0
B	ICARDA	W3 Russian Funding- Improve the productivity of marginal lands in irrigated farming and pastoral systems	Dec-12	Dec-16	B.Benli@cgiar.org	100		Uzbekistan	0.164640	15	0	85
C	ICARDA	W3 Russian Funding- Evaluate the effect of conjunctive use of canal and drainage waters	Dec-12	Dec-16	U.k.Awan@cgiar.org	100		Uzbekistan	0.073500	10	0	90
D	ICARDA	W3 Russian Funding- Improve water use efficiency through innovative technologies in irrigation and farming in cereals, potato, vegetable, horticultural and fodder crops.	Dec-12	Dec-16	V.Nangia@cgiar.org	100		Tajikistan, Uzbekistan	0.043120	0	0	100
E	ICARDA	W3 Russian Funding- Increase livestock productivity to improve availability of animal proteins to the households and increased revenues and wellbeing of the pastoralists	Dec-12	Dec-16	b.rischkowsky@cgiar.org	100		Tajikistan, Uzbekistan	0.189000	100	0	0

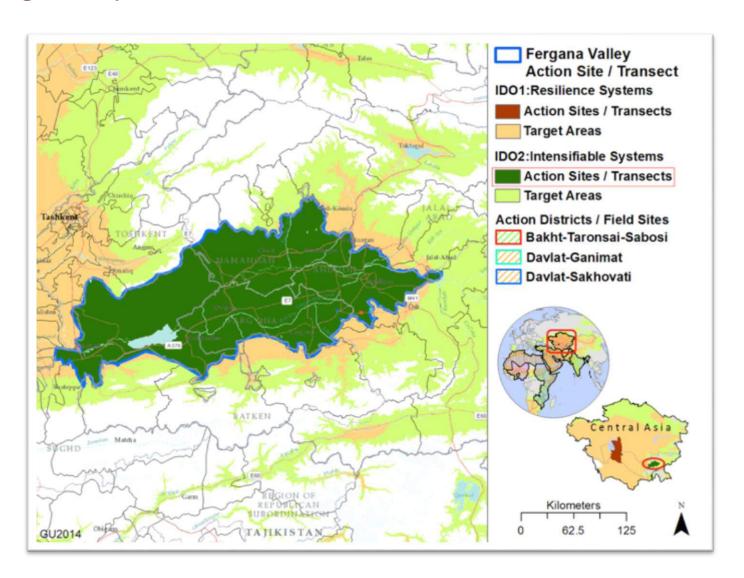| ID	Lead Center	Project or Activity Title	From	To	Email	CA %	NAWA %	Countries % (equal)	2015 Budget to DS (MUSD)	Agro-Pastoral %	Rainfed %	Irrigated %
F	ICARDA	W3 Russian Funding- Bio-economic modeling of farming systems, technological options for natural resource management under different scenarios of the state of natural resource base, market conditions and policies for determining optimal use of resources, and assessing the economic, social and environmental consequences on target population	Dec-12	Dec-16	A.Akramkhanov@cgiar.org	100		Uzbekistan	0.039200	0	0	100
G	ICARDA	W3 Russian Funding- Identify new improved varieties of cereals, vegetables, legumes, oil-seed and fodder and other non-traditional crops.	Dec-12	Dec-16	r.c.sharma@cgiar.org	100		Tajikistan, Uzbekistan	0.049000	0	0	100
H	ICARDA	W3 Russian Funding- Strengthen capacity in application of Geographic Information Systems and Remote Sensing on assessment and sustainable management of soil, water, agro-biodiversity resources	Dec-12	Dec-16	C.Biradar@cgiar.org	100		Uzbekistan	0.079729	0	0	100
I	ICARDA	W3 Russian Funding- Build capacity of men and women farmers and other stakeholders in cultivation and post-harvest practices	Dec-12	Dec-16	A.Nurbekov@cgiar.org	100		Uzbekistan	0.073500	38	0	62
L	ICARDA	W3 Russian Funding- Establish a seed systems platform compatible with existing agro-ecological environments to supply farmers with high quality seed and planting materials so as to improve livelihoods, food security and incomes of smallholders	Dec-12	Dec-16	j.turok@cgiar.org	100		Tajikistan, Uzbekistan	0.059780	50	0	50
M	ICARDA	W3 Russian Funding- Establishing Strategic Innovation Platform for multi-stakeholder process	Dec-12	Dec-16	B.Dosov@cgiar.org	100		Kyrgyzstan, Tajikistan, Uzbekistan	0.024516	50	0	50

Map 1. Central Asia Flagship Boundaries

Map 2. Aral Sea Region Action Site

Map 3. Fergana Valley Action Site

The CGIAR Research Program on Dryland Systems aims to improve the lives of 1.6 billion people and mitigate land and resource degradation in 3 billion hectares covering the world's dry areas.

Dryland Systems engages in integrated agricultural systems research to address key socioeconomic and biophysical constraints that affect food security, equitable and sustainable land and natural resource management, and the livelihoods of poor and marginalized dryland communities. The program unifies eight CGIAR Centers and uses unique partnership platforms to bind together scientific research results with the skills and capacities of national agricultural research systems (NARS), advanced research institutes (ARIs), non-governmental and civil society organizations, the private sector, and other actors to test and develop practical innovative solutions for rural dryland communities.

The program is led by the International Center for Agricultural Research in the Dry Areas (ICARDA), a member of the CGIAR Consortium. CGIAR is a global agriculture research partnership for a food secure future.

For more information, please visit

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