



RESEARCH
PROGRAM ON
Dryland Systems



CGIAR Research Program on Dryland Systems 2014 Annual Performance Report

Submitted to CGIAR Consortium Office
10 March 2015

*Food security and better livelihoods
for rural dryland communities*

TABLE OF CONTENTS

TABLE OF CONTENTS.....	1
LIST OF ACRONYMS	2
A. KEY MESSAGES	3
A1. Synthesis of progress and challenges.....	3
A2. Significant achievements.....	4
A3. Financial summary.....	5
B. IMPACT PATHWAY AND INTERMEDIATE DEVELOPMENT OUTCOMES	5
C. PROGRESS ALONG THE IMPACT PATHWAY.....	5
C1. Progress towards outputs.....	5
C2. Progress towards the achievement of research outcomes and IDOs.....	7
C3. Progress towards impact.....	8
D. GENDER RESEARCH ACHIEVEMENTS	9
E. PARTNERSHIPS BUILDING ACHIEVEMENTS.....	10
F. CAPACITY BUILDING.....	11
G. RISK MANAGEMENT.....	11
H. LESSONS LEARNED.....	12
Annex 1: CRP Performance indicators with glossary and targets	i
Annex 2: Performance indicators for gender mainstreaming with targets defined.....	xix

LIST OF ACRONYMS

AAS	CGAIR Research Program on Aquatic Agricultural Systems
ALS	Agricultural Livelihood Systems
ARIs	Advanced Research Institutes
CACILM	Central Asian Countries Initiative for Land Management
CAZRI	Central Arid Zone Research Institute
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CD	Capacity Development
CIHEAM	Centre International de Hautes Etudes Agronomiques Méditerranéennes
CRP	CGIAR Research Program
CSO	Civil Society Organizations
DFID	Department for International Development
ECBA	Extended Cost-Benefit Analysis
EUE	Energy Use Efficiency
FFS	Farmer Field Schools
GO	Governmental Organization
IDOs	Intermediate Development Outcomes
IPs	Innovation Platforms
IRTs	Interdisciplinary Research Teams
ISAC	Independent Scientific Advisory Committee
ISAM	Integrated Systems Analysis and Modeling
ITF	Independent Task Force
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
NARS	National Agricultural Research Systems
NAWA	North Africa and West Asia
NGO	Non-Governmental Organization
PMU	Program Management Unit
POWB	Plan of Work and Budget
RMC	Research Management Committee
R4D	Research for Development
S&I	Science and Implementation
SLA	Sustainable Livelihoods Approach
SLM	Sustainable Land Management
SLOs	System Level Outcomes
VBSE	Village-Based Seed Enterprises
WLE	CGIAR Research Program on Water, Land and Ecosystems
WUE	Water Use Efficiency
WASDS	West African Sahel and Dry Savanna
VCA	Value Chain Assessment
LEIS	Local Environment Information System
WHT	Water Harvesting Techniques

A. KEY MESSAGES

A1. Synthesis of progress and challenges

In 2014, Dryland Systems made significant advances in refining the systems research approach and moving towards results-based management. The program is being re-organized in the context of an agricultural livelihoods systems framework addressing major challenges and key constraints using an **options-by-context** analysis. For now, the target regions are maintained as the n-1 level of synthesis but these will be reviewed and likely revised as part of the Independent Task Force (ITF) agenda in 2015. The eight partner centers represented in the Research Management Committee (RMC) established two Dryland Systems working groups for 1) Data Management and Open Access, 2) Gender and Youth, with three other groups to be established in early 2015 on Communications and Knowledge Sharing, Capacity Development, and Integrated Systems Analysis and Modeling (ISAM). The working groups ensure coordination takes place throughout the program and partner centers through periodical interdisciplinary meeting and development of joint workplans. These coordinating structures are achieving better integration and equity amongst participating centres and stronger linkages with other CGIAR Research Programs (CRPs), especially the system CRPs.

A new governance and management structure was introduced with a strengthened [Program Management Unit \(PMU\)](#) following recommendations of the Consortium Office and audit. A prototype results-based [Monitoring, Evaluation and Learning \(MEL\) platform](#) was piloted and currently undergoing testing. The web-based MEL platform will enable better reporting, coordination, risk management and performance evaluation, as well as knowledge sharing and learning across the program.

A Science and Implementation (S&I) meeting held in July 2014 organized by the Independent Scientific Advisory Committee (ISAC) and attended by Dryland Systems scientists produced more than 30 recommendations on the approach and science for systems research. These have been incorporated into the Plan of Work and Budget (POWB2015) but still need refinement at the program level and across the system CRPs. Dryland Systems [Impact Pathway](#) was revised and a new Theory of Change will be further articulated as part of the ITF process.

As part of the response to budget reductions, the Interdisciplinary Research Teams (IRTs) in each region - composed of participating centres and other non-CGIAR partners - reduced the number of research action sites from 23 to 13, resulting in a 43% reduction in the number of agricultural livelihood systems (ALS) case studies across the five regions. Dryland Systems suspended all activities in West Asia and in one site in Central Asia. The 2014/2015 funding cuts have posed major constraints in developing and sustaining meaningful partnerships, which take time and effort to build, thus compromising the credibility of the program. Furthermore, cuts are forcing reallocation of partner centers staff time to other funding sources and often away from Dryland Systems efforts, thus imposing further implementation challenges for the program.

Progress on implementing integrated system research

In 2014, greater focus was placed on: (1) the socio-cultural, policy and institutional framework in which agricultural livelihoods operate contextualizing the production-based research programs, and (2) the investigation of interrelated causal effects of multiple interventions on the performance of agricultural production systems (i.e. productivity, efficiency, adaptability and equity). The first aspect relates to in-depth analyses across the major agricultural production systems in target drylands, the key challenges in each of these systems and the identification of system-specific constraints, priorities and possible entry points for change interventions. This holistic approach to systems analysis allows Dryland Systems to put into a comprehensive perspective a wide-ranging set of development constraints and opportunities that are used to prioritize our research-in-development interventions. The **options-by-context** approach utilized by our teams in Central Asia, South Asia and Africa demonstrated a workable integrated way of taking into account drylands' diversity in order to prioritize and address key questions (constraints, opportunities, who/to whom, where, how) that lead to overall improvements in systems performance. The newly established ISAM Working Group will help further refine and target these research-in-development interventions.

The second aspect of our 2014 research focus produced valuable insights into the interactions between farms and decision-making actors (individuals, households and community) within the ALS and with the external drivers, from which system performance and related trade-offs and synergies emerge. A number of integrated systems modeling approaches - ranging from crop sub-systems modelling, bio-economic modelling, coupled models assessment, participatory modelling - are in progress.

Dryland Systems researched multi-purpose interventions that lie at the very heart of improving the integrity of agricultural production systems. Such is the example of integrating legume crops – predominately managed by women producers - into rainfed, wheat-based systems in Central Asia in order to provide more nutritious foods, improve soil fertility, increase household incomes and thus reduce the negative impact of crop intensification on soils, while empowering women and young people.

Significant progress was made this year in understanding performance-related factors beyond production, such as seeds systems, regional food value chains, governance systems, including agricultural policies. The Dryland Systems is making use of the 45 inclusive, inter-disciplinary innovation platforms (IPs) that have been established so far to research and integrate these important factors into its systems thinking in order to empower rural dryland communities to build resilience, increase food security, and ensure social equity and sustainable natural resource management.

A2. Significant achievements

Open-access geo-databases of drylands as public goods (IDOs 1-6): There were 25 open-access databases established with Dryland Systems support. A record number of 15,000 users from 119 countries with 330 data requests and downloads were observed just from the open-access [Dryland Systems component of ICARDA's Geo-informatics](#) portal. This portal is continually improving its features to provide timely responses to user requests, as well as track impact of research activities. Comprehensive multi-dimensional gender-responsive livelihood databases of more than 3000 household-farms across Dryland Systems research sites are now available for use by various stakeholders and development agencies. For instance, CGIAR centers and external partners (e.g. Total Land Care, LUNAR University, South Africa Bean Research Network, Malawi National Bean Program, BMZ-funded projects) have used the household-farm livelihood database and the results of socio-ecological systems analyses of yield gaps conducted by the Dryland Systems scientists in the Chinyanja Triangle transect to help facilitate sustainable intensification through informed policy and management decisions. The [Climate Change and Drought Atlas for Jordan](#) that was published this year offers a set of 339 maps with a comprehensive characterization of recent and expected climate changes. This atlas will help increase the awareness of policy makers and communities on climate change issues and innovative agricultural technologies that can enable better adaptation of local dryland communities to climate change. The **unique feature** of Dryland Systems open-access databases relates to the fact that they are being organized by an **options-by-context analysis structure** in order to provide users with a comprehensive picture of all the systems elements that need to be taken into account (constraints, opportunities, who/whom, where, what and how) in order to prioritize relevant options and interventions to increase the overall performance of ALS. A [good example](#) in this type of database is provided through the work of the Central Asian Countries Initiative for Land Management (CACILM).

Adoption of sustainable land management (SLM) options by farmers (including women and youth) (IDO 1-5): In 2014, at least 4000 female and male farmers benefited from the evaluated SLM technologies in terms of improved food productivity on more than 5000 ha through direct involvement in on-farm trials. Preliminary estimations show more than 74.7 million people and 7.5 million ha benefited from agricultural production and management technologies introduced and/or improved by Dryland Systems. The SLM technologies range from the uses of improved cultivars, integrated soil and water management, diversification of crop production to crop-tree-livestock systems. For instance, the context-by-options databases, in Central Asia and farm type-options in South Asia and Africa helped farmers and agricultural agencies prioritize options well-suited to local development contexts. For example, analyses of crop-livestock systems in West Africa showed crop residues are becoming a major source of animal feed (e.g. 20 to 35% in many cases). Following these findings, on-farm trials were undertaken on the use of multi-purpose crops and post-harvest mechanization aimed at improving use/reuse of resources and subsidiary links, which in turn helped improve overall the systems

productivity and resource use efficiency. Thus far, Dryland Systems has enhanced capacities of more than **360,000 farmers and researchers (24% women)** through training interventions and through the establishment and utilization of 45 multi-stakeholder IPs. More than **58 SLM technologies** have been field-tested or released on more than **7.5 million hectares** in the five regions. The program is targeting more than **110 million people in 15 agro-ecosystems¹** that have been analysed and/or characterized.

A3. Financial summary

The total 2014 Dryland Systems budget was \$ 46.3 million USD. Of these, \$17 million USD were from the CGIAR Fund (W1&W2) and \$29.3 million USD from W3/bilateral sources. W1&2 funds were reduced in the final Financing Plan to \$15.41 million USD. The total 2014 expenses based on preliminary figures were \$38.28 million USD distributed as: \$15.41 million USD from W1&2 including firm commitments; \$6.87 million USD from W3 and \$16 million USD from bilateral funds. The detailed **L Series Financial Reports** based on audited figures will be submitted early April 2014, as per the Consortium Office calendar.

B. IMPACT PATHWAY AND INTERMEDIATE DEVELOPMENT OUTCOMES (IDOS)

Dryland Systems [Impact Pathway](#) for research-in-development interventions are in line with six focused [Intermediate Development Outcomes \(IDOs\)](#) (four of which are sub-IDOs) that contribute to the four CGIAR systems-level outcomes (SLOs). This year, the PMU developed and launched a [web-based MEL platform](#) to track baseline data, facilitate reporting and monitor and evaluate program performance against these IDOs, in close consultation with partner centers and the CGIAR Evaluation Community of Practice.

C. PROGRESS ALONG THE IMPACT PATHWAY

C1. Progress towards outputs

C1.1 Diagnosed constraints and context-specific options for improved agricultural production and livelihoods

Production System - Sustainable Land Management (SLM) option matrices have been synthesized in Central Asia, India, West Africa and Dry Savannas, East and Southern Africa. National and regional participatory processes in five Central Asia countries evaluated more than [50 SLM technologies](#). Key *constraints* and *opportunities* were mapped across these five countries in order to define spatial clusters for the adoption of the best SLM options, as well as visually illustrate the potential areas where these options can be scaled out. On the other hand, this mapping exercise was used to identify strategic target areas to disseminate specific SLM packages throughout the region. A similar approach was applied by the Dryland Systems research teams in Malawi, Mozambique, Zambia, Uzbekistan, Tunisia and India at farm and landscape levels. These teams have identified the ALS and the potential system-relevant SLM options to be evaluated and tested based on multi-dimensional gendered databases of several thousands (> 2000) of household-farms sampled in their target regions. The **options-by-context** approach is proving to be an effective and comprehensive way of analyzing all the systems elements that need to be taken into account (constraints, opportunities, as well as who/whom, where, what, how) in order to prioritize research questions and identify relevant options for research-in-development interventions. These interventions aim to increase the overall performance of ALS with respect to productivity, resource use efficiency, building of natural and human capital and flexibility in coping with and adapting to various changes in externalities. IPs - involving female and male stakeholders - that were established in Uzbekistan, Tunisia, Ethiopian, Zimbabwe and Mozambique, were used to identify and prioritize key constraints, opportunities and corresponding actions in their dryland communities. The utilization of the IPs in this way is helping to pool critical local skills and resources for greater synergy and increased research-in-development impact.

¹ CO standard indicators (ID11 & ID12).

C1.2 Options to improve the performance of agricultural production systems

Improved seed systems: As the quality of seed resources and their accessibility are key constraints for improving crop productivity, farm areas for producing improved-quality seeds various crops preferred by farmers were established in different countries (e.g. 500 ha in North Africa). The program established Village-Based Seed Enterprises (VBSE) to integrate the community-based seed production system into inclusive food value chains, offering agro-entrepreneurial opportunities to women across the target regions of Dryland Systems. Core research activities on improved seeds systems of individual centers continue to provide valuable inputs into integrated systems research, thereby extending the centers research scope from commodity to systems approach.

Integrated crop and nutrient management practices for reducing yield gaps: Soil fertility remains a prime concern of dryland farmers. In South Asia, more than 750 on-farm trials on different crops for improved cultivars, balanced nutrition and soil and water conservation were implemented and evaluated. These showed that new combinations of improved varieties and integrated soil nutrient management practices can increase crop yield from 10% to >150% depending on crops and site condition. On-farm trials (> 120) in different areas in Malawi identified best-bet practices for improving crop productivity: cereal-legume rotation using new bean varieties and soil fertility management yielded [189% higher than the long term national average](#). Several hundred on-farm trials on the same type of interventions in East, West, and North Africa are being monitored and evaluated. The focus is on the introduction of legume crops – predominantly managed by women producers - into dryland farming system in order to provide more nutritious foods and improve soil fertility, thus reducing negative impacts of intensification on soils.

Multiple stress-tolerant crop varieties to enhance the productivity and adaptability of dry land production systems to climate change: Salinity and weed tolerant cultivars of wheat, beans and pearl millet, together with improved agronomic management practices, were disseminated to farmers in [Central Asia](#), and North, West and South Africa. [More than 200 improved varieties of winter wheat](#) were evaluated in Central Asia by on-farm trials across different agro-ecological zones for tolerance to salinity and frost; [13 yellow rust resistant winter wheat varieties](#) were evaluated for yield performance; [12 clones](#) of potato evaluated on saline soil and under high summer temperature; [11 clones of potato and 10 chickpea varieties](#) were evaluated under heat stress conditions, [4 varieties of mung bean](#) were evaluated on saline soil. Following multiple years of research and multi-location trials across Central Asia a synthetic wheat variety, called "[Davlatli](#)", with boosted resistance to salinity, frost, heat and drought was released to the State Variety Testing Commission in Turkmenistan. Preliminary observations show these new varieties had equal or higher yields (from 10% to 150%) compared to currently used varieties. The evaluation of how these crop production packages help reduce climate-driven vulnerabilities and increase overall income of farm and livelihood systems is ongoing. The use of whole farm systems analyses including bio-economic modeling tools and total factor productivity is now a major focus in 2015. Assessing the effects of varietal improvement on ALS performance, rather than response yields only, distinguish the system CRP from commodity based CRPs.

Diversification of agricultural livelihood systems: Tested options for farm diversification include two groups: diversification within a production sub-system (e.g. crop and/or livestock diversification) and diversification of production components (e.g. integration of crop-tree-livestock). In Niger and Nigeria dual purpose crops - cereals, oilseed and legumes - were tested for integration in agro-pastoral systems. Residues of these multiple crops were used as fodder in sheep fattening experiments. The use of trees for improving and buffering farm system productivity in Burkina Faso, Ghana and Niger are being evaluated. Female and male farmers were strongly involved in these tests.

Integrated soil-water management practices for increasing resource use efficiency and building natural resource capital: In Central Asia, water use efficiency (WUE) and energy use efficiency (EUE) of different integrated crop production systems were evaluated. Cultivation of mung beans after winter wheat helped farmers capture the benefits of biological fixation of nitrogen, gain an additional 1.4-1.5 t/ha with a lower WUE and secure prices three to four times higher than wheat. The EUE of production systems that had integrated mung bean was higher due to lower requirements for N fertilizers. Three reports were published on household vulnerability, on quantification of risk in technology adoption and

on climate change impact on gender vulnerability for three action sites in India. Evaluations of options for [improved management of common silvo-pastoral systems and improved water management by integrating small Khadin cropping systems](#) showed that rainwater harvesting and crop under extreme dry conditions (100-150mm rainfall) increases the financial returns on investments in the range 2-4 times compared to controls. In West Africa action sites, integrated system practices involving rainwater harvesting technologies, leafy vegetables and high value trees were tested in 88 villages. A total of 288 successful tests were conducted and 31 successful Farmer Field Schools (FFS) that involved more than 620 farmers (16% female).

Inclusive value chain development: Dryland Systems identified, verified and implemented areas of “best-bet” interventions for value chain enhancement, such as small ruminant meat value chain assessment (VCA) at the field sites in Central Asia. Furthermore, three IPs in Kano State have effectively brought together relevant stakeholders involved in wheat production, processing and marketing. Dryland Systems organized village-based technical symposia to raise the awareness of farmers and stakeholders participating at different IP sites. For instance, participating centers in Nigeria carried out about 950 demonstrations in 438 villages in 73 local government areas in 16 states across the country. Their efforts were supported by Nigeria’s funds for Groundnut and Sorghum Value Chains.

Open-access Geo-databases of drylands as public goods: There were 25 open-access databases established. In 2014, there were more than 1000 data sessions recorded to the [Dryland Systems component of ICARDA's Geo-informatics](#) portal (open-access). For example, the [Climate Change and Drought Atlas for Jordan](#) with its set of 339 maps, offers a comprehensive characterization of past and expected climate change in Jordan.

C1.3 Introduced and/or tested system methods and tools

LEIS (Local Environment Information System) A GIS-based modeling tool to evaluate and assess desertification risk was introduced and used by teams in Tunisia. The tool applied with the cooperation of the local actors showed its simplicity and its acceptance and has potential for out-scaling.

Impact analysis of water harvesting techniques (WHT) for rural livelihood conditions under climatic and socio-economic scenarios and profitability is an Integrated Impact Assessment (IIA) framework; Based on Extended Cost-Benefit Analysis (ECBA) and Sustainable Livelihoods Approach (SLA), it was calibrated and applied for Beni Khedache-Sidi Bouzid action site (Tunisia).

Dryland Systems helped establish a web-based 'Knowledge Platform' for Central Asia at www.cacilm.org. The website provides synthesis and consolidation of best practices on SLM. These can be farmer innovations, examples of sustainable management of water, land and forest resources, sustainable farming methods, pasture use, improved livestock and crop production, and promising scientific developments concerning climate change. This will be used in a second phase of CACILM, a research for development program.

C2. Progress towards the achievement of research outcomes and IDOs

Dryland Systems measures progress towards the 6 IDOs through four interrelated pathways: (1) published scientific knowledge on dryland agricultural production/livelihood systems as an international public good through partner centers; (2) newly created genetic and integrated data resources made available and used to stabilize and increase dryland agricultural production; (3) increases in the rate of adoption (both number of adopters and adopted technologies) by Dryland Systems beneficiaries of SLM options developed and tested through our IPs, and; (4) increased stakeholders capacity in terms of increased knowledge, skills and perspective/behavior change vis-à-vis ALS. Women and young people are an integral part of these assessments aiming at greater equity in access to research results and benefits from our research-in-development interventions. In 2015, Dryland Systems will further strengthen this set of criteria.

Published scientific knowledge as an international public good (toward IDOs 1-6): In 2014, partner centers produced 127 published articles (72 indexed by ISI), 3 books, and several policy and technical briefs. There is a clear move emerging towards the examination of new systems approaches in this body

of scientific knowledge, including two strategy papers. We expect the systems approach will generate greater public awareness of agricultural livelihood issues in dryland areas and reshape traditional thinking about key performance determinants of dryland agro-ecosystems and relevant responses to meet challenges faced by rural dryland communities. For example, there was a significant uptake of the gender-responsive [Treesilience book](#) submitted to the Department for International Development (DFID), describing the resilience provided by trees on farms as a result of Dryland Systems research activities in East Africa. The book was used to write an Evidence on Demand report commissioned by DFID to support the design of a DFID-funded development project in Karamoja, Uganda.

Newly created genetic resources available and used for enhancing and stabilizing agricultural systems productivity (IDOs 1-3): More than 620 tons of quality seeds of crop cultivars tolerant to common environmental stresses in drylands (e.g. over-heating, drought, salinity) have been produced. This important resource is accessible by local communities and regional stakeholders for increasing and buffering dryland agricultural production and in coping with unexpected climate change. Furthermore, seed systems research was conducted in station-based and on-farm seed production units across dry lands in North Africa, West, Central and South Asia and which have been integrated into local agrarian landscapes.

Research results influencing agricultural policy (IDO 1-2): The impressive performance of the newly introduced heat-tolerant varieties and wheat-based technologies has created a viable new intensified rainfed, cereal-based system in the West Africa tropics with yields of 4-6 t/ha – significantly more than 1-2 t/ha average of traditional varieties. This has [convinced policy makers](#) and influenced agricultural policy in Nigeria. Accordingly, wheat has been included as a main priority in the Agricultural Transformation Agenda of the Nigerian Government, with domestic production being selected as the targeted solution for curbing the country's ever growing import dependence and for ensuring food security. The Government of Nigeria has launched a national action plan to scale up best practices to increase the wheat production area from the existing 70,000 ha to 340,000 ha, and reduce wheat imports by 45% in the next five years.

Increasing the use of innovation platforms (IPs) (IDO 6): IPs in Dryland Systems are based on partnerships between government departments, non-governmental organizations (NGOs), regional research centers, universities and the private sector. The IPs are bringing together local private and public stakeholders - men, women and young people - to create an enduring basis for identifying and understanding key system constraints, options and entry points and articulate mechanisms for structuring and implementing initiatives and institutionalizing processes that scale up and scale out the appropriate research-in-development interventions that will secure the greatest impact at local, national and global levels. These IPs ensure Dryland Systems scientific knowledge and research outputs are shared and disseminated widely. The feedback mechanisms inherent in the IPs allow Dryland Systems to design better and targeted research-in-development interventions that involve and are owned by the major stakeholders, who can sustain the process of scaling these intervention up and out in the long run. The focus of the currently established IPs have been on scaling out best SLM practices and the development of inclusive food value chains over a large region or several regions.

Increased capacity of stakeholders in terms of increased knowledge, skills and perspective/behavior change vis-à-vis agricultural livelihood systems (IDOs 5-6): In 2014, the Dryland Systems accommodated more than 368,000 short-term trainees (23% women) from local communities, National Advanced Research Institutions (NARs), governmental organizations (GOs) and NGOs. Trainings covered a range of topics, including sustainable intensification, integrated soil and water management, vulnerability assessment, and integrated systems assessment and modeling. A total of 39 Ph.D. students (8 women) and 61 Master students (52 women) successfully completed their education. Post-training evaluations are underway to track how new knowledge, technologies and skills are applied and disseminated by the trainees.

C3. Progress towards impact

Measuring results and impact of systems' research is not that straightforward. A key characteristic of this type of research is that it addresses complex (non-linear) dynamics of socio-ecological systems that operate at different scales of time, space and human organization. Therefore, it is necessary to build

on previous research, which can often contribute to system level impact. One example is the success of [scaling up conservation agricultural packages implemented in agro-pastoral systems in Tunisia by ACIAR-CANA project](#). Early successes are encouraging. Critical mass improvements in drylands food security, livelihood equity and resilience as a result of systems research need longer gestation periods, likely to be realized beyond the medium term of the program (e.g. 5 years). At this stage, an important part of the Dryland Systems' impact measurement will be the foresight (ex-ante) assessments using (1) relevant integrated system assessment and modeling tools, and (2) criteria and indicators of system performances and ongoing M&E. These assessments were planned in late 2014 and will be developed and implemented in 2015-2016. Another mechanism to measure and ensure progress towards impact will be the through the utilization of IPs that reflect wide-ranging partnerships. We will test the means for scaling up the place-based ALS research outcomes to higher hierarchical levels and then scaling these out to other dryland regions and monitor progress and success. Greater impact will likely be generated through open access and wide-spread dissemination of Dryland Systems scientific knowledge, technologies and best practices through different means of communications and knowledge sharing tools and processes which the program has adopted and/or developing and improving. In addition to creating substantive and measurable impacts, actions are undertaken towards changing behaviors, perspectives, and perceptions through *Learning Alliances* established within and outside of dryland communities in order to address particular concerns relating systemic, adaptive actions to meet the grand dryland challenges.

D. GENDER RESEARCH ACHIEVEMENTS

In order to reach gender-responsive IDOs leading to women's empowerment and gender relations conducive to development, this year Dryland Systems' research focused on examining agricultural livelihood system opportunities, resource distribution and management of vulnerability risks. Dryland Systems programmatic approach to achieve gender equity and equality is described in the [Gender Strategy](#) approved in January 2014.

Gender-responsive research, aimed at [IDO 2 and IDO 3](#), focused on the empowerment of female actors along food-related value chains and the removal of agro-economic constraints faced by women. For example, our research examined gender-related resources endowment and (land use) decisions along the value chain in Malawi. Dryland Systems identified specific constraints faced by women and youth to out-scaling intervention in the sheep value chain in North Africa and olive oil value chain in Jordan and informed women-focused approaches to agriculture/livestock value chain development in West Rajasthan. Pilot interventions included the following: 1) built capacity of women to manage common property resources jointly in 6 villages in India, 2) trained 66 women to manufacture eight value-added products in Pakistan, 3) facilitated a series of community based workshops with women and men in 5 villages in Mali to identify opportunities for the introduction of high-yielding fodder and fruit tree species, and 4) trained female and male youth in nursery management there. Research results from Rajasthan and Andhra Pradesh (150 women plus women in 6 villages) on dietary diversity and multi-species kitchen gardens (e.g. 10 to 20 arid fruit plants) are currently being synthesized to inform strategy for improving food security and nutrition of women. In the Nile Delta, entry points were defined to strengthen women as vegetable producers, and a bio-economic model was devised to be used in similar research projects in the future. In Ghana, sweet potato varieties as a nutritious crop for food and animal feed were tried and seeds disseminated to vulnerable households. Other research in Mali, East Africa, and Jordan focussed on strengthening the capacity of women and men to identify and adopt innovative crops. Technologies enhancing water security, natural tree/soil [regeneration](#), and compost production were shared with women and men in Niger and Ghana to increase nutritional security.

Gender equity and women's management of vulnerability risks was also approached by involving women thus addressing [IDO 4 and IDO 6](#) across all regions. Gender issues were mainstreamed in diagnostic tools and methods for salinity management in Central Asia; women and men were trained to manage grey water use in Jordan, to conduct landscape health assessments in Ghana, and to manage [conservation](#) agriculture in pilot projects in the action sites of South Asia, North and East Africa. The role of women in climate change adaption strategies was researched in India (2 action sites) and on increasing resilience to [climate change](#) (IDO 1) in Jordan, Ghana and the new lands of Egypt and East Africa where the '[Treesilience](#)' book was produced. The awareness of stakeholders was raised on seed systems institutions and the role of gender in seed systems through the IPs in Central Asia. In West

Africa, 214 women were trained on improved agronomic practices and low input technologies of seed treatment for increased productivity. A [medicinal plant](#) intervention in Jordan works against soil degradation and enhances the income of women at the same time.

Across the five regions, IDO 5 GENDER EMPOWERMENT research looked at gender roles and related systems elements. [Gender equity](#) in decision making, gender roles regarding different crop types, labor and agro-production related resources (tools: 4 questionnaires), and the relationship between land tenure and input use was researched in East, West and North Africa (e.g. survey on 400 male and female farmers in North Africa). Work opportunities for women and the gender wage gap in agricultural labor were researched in North Africa. Women (and youth) participating in 19 IPs and in 6 Learning Alliances contributed to decision making on research topics and the identification of entry points for engagement. Women took part and membership in various management and decision-making structures relating to different agricultural activities, such as village development committees (e.g. 22-45% women participation in Western Rajasthan action site villages). To foster mutual learning, [the Gender Working Group with members from all participating centres was formed in 2014](#), producing as a first result, Guidelines for Gender Responsive Research for Biophysicists. Dryland Systems is well on its way to achieve the two IDO 5 indicators.

E. PARTNERSHIPS BUILDING ACHIEVEMENTS

Dryland Systems relies on a diverse array of [partnerships](#) with NARS, ARIs, civil society actors, the private sector and participating centers to engage in integrated agricultural systems research and ensure its research outputs are effectively utilized in order to fulfill the program's mission.

Use of research outputs and outcomes by partners: During 2014, many of our partners (including but not limited to NARS, NGOs, ARIs, Academia, private sector, national governments and other CRPs) reported evidence of direct influence of Dryland Systems research outputs on increased agricultural production and policies in several countries and regions, such as Egypt, Tunisia and Morocco, [Turkmenistan](#), India, [East](#) and [West](#) Africa.

Knowledge partnerships: A key partnership established in 2014 in the NAWA region between advanced research institutions ([SupAgro](#), [IAMZ](#)), Wageningen University and the University of Madrid was used to advance systems-thinking research through joint [training in systems analysis and modeling](#). The West African Sahel and Dry Savanna Region worked with a host of national research actors and development partners to [link farmers knowledge to process-based science](#) in order to sustain the production in sorghum and millet-based systems in the face of variable and uncertain rainfall and thus, reduce vulnerability in the Sahel. The new [Regional Program in the Sahel and the Horn of Africa Enhancing Food and Water Security for Rural Economic Development](#) with which Dryland Systems cooperates aims to trigger rural economic growth in semi-arid drylands in five African countries (Mali, Burkina Faso, Niger, Ethiopia and Kenya) through improvement of water and food security and development of markets and value chains. In Central Asia, several national and regional organizations are working to consolidate and disseminate scientific knowledge in order to scale up SLM interventions identified through the IPs, promote climate change adaptation approaches and improve agricultural productivity. Actors targeted by this initiative vary from key policy and decision makers in each participating country to NGOs and rural development and extension agencies at national and regional level, farmers and farmers' associations, as well as international donors. In South Asia, partnerships with the Central Arid Zone Research Institute (CAZRI), the Swami Keshwan and Rajasthan Agricultural University and Rajasthan State Agricultural Implementing Test Center at Hanumangarh are used to jointly test and validate systems modeling scenarios. Dryland Systems is also making use of village development committees to enhance market access and institutionalize sustainable land and water management practices in many rural local communities in India. Initially piloted in Egypt and Morocco, the concept of [learning alliances](#) – as the joint articulation of research-for-development agendas in collaboration with a host of stakeholders from farmers and rural communities to researchers, private sector and civil society actors, as well as donors and policy makers – is now being rolled out to Jordan and Tunisia. These learning alliances aim to develop business models that ensure appropriate uptake of knowledge and innovative technologies by dryland communities.

Strategic partnerships with other CRPs: Dryland Systems is utilizing the research outputs of five CRPs (Wheat, Dryland Cereals, Grain Legumes, WLE and CCAFS) to bring together a number of national research institutions, private farmers, governmental organizations and CG centers to implement systems research activities on improved seed systems and on-farm adaptive trials. The work on evaluation of crop varieties for fodder in the South Asia Region involves collaboration with 3 commodity CRPs (Grain Legumes, Dryland Cereals and Livestock & Fish). CRP system conferences starting with [one in Nigeria](#) in 2015 are being jointly planned with CRP on Humid Tropics and Aquatic Agricultural Systems (AAS) as part of greater inter-CRP collaboration efficiencies.

F. CAPACITY BUILDING

In 2014, Dryland Systems established a group of Capacity Development (CD) focal points nominated by each participating center in order to assess the role of CD in reaching outcomes, and to articulate a strategic approach to guide CD efforts in accordance with the program impact pathway and theory of change. Various participatory methodologies for gathering essential data including key informant interviews, surveys, document review and analysis, surveying of internal CD trends and stakeholders meetings were utilized to source knowledge for drafting a holistic, inclusive, results-oriented and sustainable CD strategy. The resulting [Capacity Development Strategy](#) document adopts a comprehensive definition of CD that goes beyond the traditional definition of training workshops to include: knowledge sharing and communications, mentoring, coaching, internships, degree and non-degree research, policy and process development, governance restructuring, equipment supply, infrastructure development, partnership mediation, strategy development and up to 60 types of interventions aimed at strengthening capacities of individuals, organizations and systems, and provide an enabling environment for development.

The three CD goals articulated in this strategy align with those adopted by major international CD networks and target mainly the capacity development of core individuals and organizations operating in poor, rural dryland communities. The three goals have six expected outcomes that in turn have thirty-five indicators to ensure progress in implementation. The Strategy is supplemented with an Action Plan and Results Framework detailing expected milestones together with lead activities and outputs. In order to ensure sustainability of CD efforts in the long term, the strategy stipulates an approach of wide partnerships with international, regional and local organizations, private sector and civil society for greater impact, outreach and innovative resource mobilization. For a summary of Dryland Systems CD activities that took place this year, please see table in **Annex 1** and [2014 Regions Annual Performance Reports](#).

G. RISK MANAGEMENT

The CRP program cycle has been designed to provide stability to research especially for system programs, which struggle to abandon silo thinking and integrate research. Also, results from systems research follow a slower route to achieve impact. Dialogue and partnerships established with key national partners during the first year of program implementation has been seriously hampered by the significant reduction of funds effectuated in mid-2014. Dryland Systems responded by creating a risk management plan and using it to identify major risks. The risk associated with the volatility of funds was overcome by the program through selection of partners and reduction in action sites based on research-for-development priorities and outcomes. On the other hand, the establishment of [Interdisciplinary Research Teams](#) (IRT) with members from different partner CG centers to write joint project proposals to secure bilateral funds has enabled Dryland Systems to guarantee a minimum 3 years programmatic cycle.

Dryland Systems successfully assessed the risk associated with delivering system-based research results within a short time frame. The program mitigated this risk by establishing partnerships with global leaders in system research such as Agropolis International, Wageningen University, Centre International de Hautes Etudes Agronomiques Méditerranéennes (CIHEAM), and other CRPs in order to reduce delivery time. As a result, these partners have now been included in the IRT at regional level in order to provide results on the ground, whilst reviewing performance and POWBs.

The risks associated with political instability (i.e. Sahel region travel restrictions to research staff from CGIAR centers), terrorist activities (i.e. Boko Haram) and exceptional disease outbreaks (i.e. Ebola epidemic which created fear for scientists meeting and travelling to some research sites) have been anticipated by the Dryland Systems program based on its experience since the inception phase and the instability occurring at that time in the Near East and North Africa Region. The geopolitical difficulties further hamper farmers' daily efforts for survival. The knowledge acquired in the past and the broad partnership network established by the program resulted in an intensive interaction with other CRPs and more aggressive delegation of field activities towards national partners. This helps the involved partners to understand better the underlying natural resource constraints and the need to integrate the population in all aspects.

H. LESSONS LEARNED

Overall level of confidence/uncertainty of the indicators provided in Table 1: A common template for reporting was used this year but may need revision in 2015 to fit the purpose of systems research. The current template is better suited to commodity-oriented research as opposed to systems research. In addition, the monitoring of outcomes is not fully enabled by the current set of 34 indicators, especially those concerning two main program components, CD and Gender. Dryland Systems established a web-based [MEL platform](#) to facilitate capturing and reporting process, and also included additional outcome-level indicators. The CD component will include pre and post assessment for CD interventions in order to ensure the added value of Dryland Systems' CD approach is fully captured by the program's set of indicators. There is some uncertainty associated with indicators such as number of technologies and tools developed. In some cases, the already existing tools and technologies are adapted to meet specific local conditions, as opposed to developing entirely new tools and technologies. Technologies such as water harvesting structures and improved varieties are not necessarily developed by Dryland Systems, but are adapted to suit local conditions and thereby Dryland Systems activities lead to their increased adoption. However, they do serve to assess qualitatively the progress made in achieving the targeted outputs and outcomes. Although it is understandable that targets should be set to monitor progress, some of the indicators selected for specific categories are challenging to estimate. For instance, it may be difficult to know the potential number of users of an open access database. In addition, estimates of the total population of an agro-ecosystem can be as good as population estimates for the countries/districts/regions within the respective systems. The same is true for the number of people who will potentially use plans and/or technologies. The terminology used to define areas of research as agro-ecosystems is limiting in terms of addressing and/or capturing the results of Dryland Systems work in relation to the socio-ecological aspects of the system.

Description of research avenues that did not produce expected results, and actions taken by the CRP: Despite efforts to improve the technical capacity of national implementing partners, timely delivery of quality outputs remains an issue of concern. Integrative research is largely foreign to the NARS. This impacts outputs and thus indirectly the indicators. We stress that more interventions in CD are required. In this regard, Dryland Systems established a working group and defined a robust [Capacity Development Strategy](#) with key partners, such as [The Global Forum on Agricultural Research](#). The implementation plan will be developed in 2015 in order to secure funds for these strategic activities in the next two years. Joint training amongst the 3 system CRP's is being discussed.

Lessons learned by the CRP from its monitoring of indicators and from qualitative analyses of progress: Strengthening multi-crop/forage seed multiplication systems, increased yields from crop varieties tolerant to cold, drought and heat, and synergistic crop rotations in wheat and rice systems substantially help smallholders to improve and stabilize incomes and adapt to climate change living in the Aral Sea Basin. The program benefited from cost sharing and direct involvement of local communities in developing a stronger commitment from local partners, and to secure other types of contribution from stakeholders in the form of labor, local material and financial local government support. All this helped the program to develop more tools, products, field tested technologies, and allowed more value chains to be analyzed and more hectares to be put under improved technologies or management practices than originally targeted. We will include in-kind support and cost-sharing contributions to evaluate the commitment of third partners and the relevance and alignment of CRP research with national programs,

such as the [Science Agenda for Agriculture in Africa](#). We learned that targets on specific indicators related with gender and gender disaggregated data² may be reduced by mapping bilateral/W3 projects. This occurs because most of the mapped projects have been initiated before the Dryland Systems started and the program cannot modify the individual centers agreements with the donors to incorporate a gender dimension. Dryland Systems was the first CRP to develop guidelines for mapping bilateral projects, including detailed criteria for screening and evaluating expected research results by the RMC.

We note that implementing interventions through existing farmer organizations such as multipurpose cooperatives enabled us to scale up and reach out to a larger number of target community groups. At the same time, capacities of these FOs are also enhanced. Dryland Systems intends to continue working in this way in order to achieve the program objectives, as well as ensure sustainable future impact through FOs that contribute to local development long after Dryland Systems support. The program has built its activities on existing initiatives of national governments, local partners and the communities and draws in global knowledge because we believe that this anchors Dryland Systems research in the national and local priorities, works with committed local communities and opens doors for dialogue at national and regional levels. Obviously, as we depend on our partners' knowledge of local conditions, constraints, opportunities, national and global experience, the attribution of impact of the Dryland Systems research needs to be shared fairly. Dryland Systems sees its engagement with all partners as the cornerstone of achieving lasting research-in-development results and impact.

I. CRP FINANCIAL REPORT

The detailed L series financial reports based on audited figures will be submitted early April 2014, as per the Consortium Office calendar.

There are 9 financial reports as follows:

1. Report L101 - Annual CRP Financial Summary – by CG Participant
2. Report L102 - Cumulative CRP Financial Summary – CG Participant
3. Report L111 - CRP Annual Finance Plan Summary (by Center, Windows 1 and 2)
4. Report L121 - CRP Expenditure by natural classification- by CG Center
5. Report L131 - CRP Expenditure by Theme/Flagship Project and by Cluster of activities²
6. Report XXX- CRP expenditure on gender research by Theme/Flagship Project and by Cluster of activities³
7. Report L201 - CRP Bilateral Grants Summary - by CG Center
8. Report L211 - CRP Partnerships Report- by CG Center
9. Report L401 - CRP Funding Statement – Windows 1 and 2

² Table 1: ID2 ID3, ID5, ID6, ID19, ID20, ID25

Annex 1: CRP Performance indicators with glossary and targets

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
1. Number of flagship “products” produced by CRP	<p>Gender in agroforestry: Implications for Action-Research & La parité hommes-femmes dans le secteur agroforestier: Incidences pour la recherche-action as products from the guidelines for Integrating gender into Dryland Systems Biophysical Scientists Research. Farmer managed natural regeneration practice included in the video on “Climate smart agriculture needs more than just farmer managed natural regeneration” in Tominian, Mali. Concept on the multipurpose motorized groundnut mill & Concept on the groundnut roaster as products from the groundnut-rice system (groundnut and rice in dry and wet seasons, respectively).</p> <p>Women empowerment and household nutrition enhancing through application of integrated measure for land rehabilitation called “Bioreclamation of degraded land”. Published in Africa Nimdea Newsletter.</p> <p>Dryland Systems Household Surveys - Report on Preliminary Data Analysis.</p> <p>“Treesilence, an assessment of the resilience provided by trees in the drylands of Eastern Africa” in the form of policy brief, factsheet, technical brief and two blog stories.</p> <p>IBLI Brief - Andrew Mude (2014) Index Based Livestock Insurance impact brief. & IBLI – Takaful Insurance of Africa 2014 media coverage.</p> <p>Multiple-stress (salinity, frost, heat, disease) tolerant varieties of winter wheat, chickpea, mungbean and potato: 32 winter wheat genotypes tolerant to salinity and frost in Aral Sea Region in Uzbekistan, 5 frost tolerant, high yielding winter wheat varieties in Sugd province, Tajikistan, Fergana Valley Action site, 4 yellow rust resistant winter wheat varieties in Fergana province, Uzbekistan, Fergana Valley Action site, 2 heat tolerant chickpea varieties in Khorezm Province, Uzbekistan, Aral Sea Action Sites, 2 salinity tolerant, high productive potato clones in Karakalpakstan, Aral Sea Action Sites, 2 heat tolerant, high productive potato clones in Fergana province, Fergana Valley Action sites, 3 improved mungbean varieties in Fergana province, Fergana Valley Action site, 2 improved mungbean varieties in Karabuga farm, 2 improved topinambur varieties on marginal lands for improving forage and tuber production. One salt –drought tolerant and early maturing pearl millet variety; Seed production (562 ton) of improved varieties wheat, barley, chickpea, mungbean, potato, sorghum, alfalfa and perennial shrubs on 175 ha; SLM knowledge sharing web-platform “Knowledge 4 Sustainable Land Management” launched with technologies, practices and approaches; One booklet with 8 stories on crops diversification on marginal lands including technology packages of crops cultivation produced.</p>	<p>+ 85%</p> <p>Target was set in early 2014 when a system to track bilateral projects results was not in place. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.</p>	20	30	48	89	28

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
	<p>4 concept reports: Land Reforms and Feminization of Agricultural Labor in Sughd Province, Tajikistan, Interactive institutional design and contextual relevance: Water user groups in Turkey, Azerbaijan and Uzbekistan, Report on qualitative survey analysis from Komiljon Umarov WUA "WHAT BUILDS INTO the WATER USE EFFICIENCY at the household level- Baseline analysis". (Based on Dryland Systems Gender Strategy), Multi Use water services discussion on multiple uses of water and gender issues;</p> <p>4 News-releases: "Are more women farmers a good thing in Tajikistan?", "Changing face of agriculture in northern Tajikistan", NARES and Extension staff incorporate good governance practices for improved land and water management, Institutions as key drivers of collective action in WUAs [Water User Associations] of Uzbekistan</p> <p>8 products related to rangeland monitoring and management; Climate Change and Drought Atlas for Jordan; Cheese processing packaging "the modified Jameed" method; Technical package on raisedbed machine in the Nile Delta; Agronomic packages on salinity and orobanche tolerant fababean cultivars; Three lentil genotypes promising lines were released at Gemmiza research station; Two value chain for olives and sheep in Tunisia; Two learning alliances initiated; Four IPs established; Influence of Acacia trees on near-surface soil hydraulic properties in arid Tunisia; Impact of climate change on olive in Medenine, Tunisia; Modeling tool to evaluate and assess desertification risk; Impact analysis of water harvesting techniques (WHT) on rural livelihood conditions under climatic and socio-economic scenario and in Oum Zessar, Tunisia; Participatory assessment of land and water policies in Beni Khedache, Tunisia; Assessing the vulnerability of agro-pastoral systems in Tunisian arid zones (food security, coping strategies and adaptation to drought); Impact of deficit irrigation with saline water on yield, soil salinization and water productivity of barley in arid regions of Tunisia; Investigating anti-oxidant properties of camel milk in Southern Tunisia.</p>						
2. % of flagship products produced that have explicit target of women farmers/NRM managers	<p>Gender in agroforestry: Implications for Action-Research: La parité hommes-femmes dans le secteur agroforestier: Incidences pour la recherche-action; Farmer managed natural regeneration practice included in the video on "Climate smart agriculture needs more than just farmer managed natural regeneration" in Tominian, Mali.</p> <p>Concept on the multipurpose motorized groundnut mill & Concept on the groundnut roaster as products from the groundnut-rice system (groundnut and rice in dry and wet seasons, respectively). Women empowerment and household nutrition enhancing through application of integrated measure for land rehabilitation called "Bioreclamation of degraded land". Published in Africa Nimdea Newsletter.</p> <p>The Treesilience book was targeted to include gender in its review of resilience from trees.</p> <p>1 concept report: Multi Use water services discussion on multiple uses of water and gender issues;</p> <p>2 News-releases: "Are more women farmers a good thing in Tajikistan?"; "Changing face of agriculture in northern Tajikistan".</p>	- 66% Target was set in early 2014 considering only W1/W2 activities despite bilateral projects have less explicit target on women. The program cannot modify bilateral programs results. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.	20%	30%	50%	17%	50%

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
	Community inclusion: enhancing the resilience of dairy producers in southern Jordan ; Climate change; Introduction of small-scale olive harvesters; Grey water installation and use led by local beneficiary women's committee (LBWC); Cactus pear (<i>Opuntia ficus-indica</i>) as an alternative and sustainable livestock feed in West Asia; Camel milk anti-oxidant (Tunisia).						
3. % of flagship products produced that have been assessed for likely gender-disaggregated impact	Dryland Systems Household Surveys - Report on Preliminary Data Analysis. The book " Treesilence, an assessment of the resilience provided by trees in the drylands of Eastern Africa " included multiple chapters with sections reviewing gender. 2 concept reports: Land Reforms and Feminization of Agricultural Labor in Sughd Province, Tajikistan , Report on qualitative survey analysis from Komilion Umarov WUA "WHAT BUILDS INTO the WATER USE EFFICIENCY at the household level- Baseline analysis" . (Based on Dryland Systems Gender Strategy), 1 News release: NARES and Extension staff incorporate good governance practices for improved land and water management Sheep milk processing and marketing, Olive harvesting and processing, Grey water installation and use. Gender differences in Demand for Index-based Livestock Insurance.	- 82% Target was set in early 2014 considering only W1/W2 activities despite bilateral projects have less explicit target on women. The program cannot modify bilateral programs results. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.	20%	30%	50%	9%	32%
4. Number of "tools" produced by CRP	2 Questionnaires for Community Members & labor service providers to access gender equity in decision-making, access to and control over household and non-household labor. 2 Questionnaires addressed to agricultural and agroforestry products' collectors and processors including Men and Women, to access gender equity in decision-making, access to and control over household and non-household labor. Trade-off analysis (TOA-MD): Paper published on trade-offs in crop residue uses. Typologies: farm typologies developed based on household baseline and verification for tailoring interventions in mixed crop livestock systems. Farming systems modeling: APSIM calibrated for various crops, IAT an APS farm in process Tool to analyze drivers for sustainable management of CPRs- khadins & common pasture. Bio-economic modeling of farming systems using attribute from DS household survey data and also rich Village Dynamics in South Asia (VDSA). Experimental design and data analysis using Genstat training manual translated in Russian could be valuable for researchers, and teachers in Central Asia; Synthesis and collection of over 50 SLM that is applicable in Central Asia ; Prioritization of 4-to-8 SLM for demonstration and promotion ; Training manual for similarity mapping analysis for dissemination of selected SLM in Central Asia in 4 target ALS; Guidelines and script for downloading and bias correction of downscaled climate change models;	+ 248% Target was set in early 2014 when a system to track bilateral projects results was not in place. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.	20	24	27	94	53

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
	<p>One book on utilization of <i>Kochia prostrata</i> – perennial fodder shrub for rangelands improvement and livestock feeding; Rapid SR VCA tools developed (livestock) in Ethiopia and Pakistan were adjusted to Central Asian conditions and translated in Russian; 5 DSSAT models calibrated for 5 cultivars of winter wheat using past datasets; 12 Guidelines on cultivation and irrigation of potato in Central Asia. Cactus as a multipurpose species (fodder, cash crop) (CGIAR Talking Science Competition); Reversing degradation in rangelands by promoting sustainable forage species; Grazing Management under Water Harvesting Systems; FAO-ICARDA International Technical Cooperation Network on Cactus Pear; Improve rangeland managements of more fertile dryland rangelands (landscape depressions); Managing feed resources in an agro-pastoral production system (Jordan); Sheep milk Value addition; Cactus as a sustainable and versatile plant for the dry areas; Reversing degradation in rangelands by promoting sustainable forage species; Community inclusion: enhancing the resilience of dairy producers in southern Jordan; Deficit irrigation: a policy option for natural resource planning; Scaling-up Dryland Systems' Innovations; Investing in Rangelands: Agro-Ecological monitoring of Jordanian 'action sites'; Reinforcing best-bet grazing practices; Sheep breeding: introducing scientific methods to monitor and record flock performance; Exploring ways to increase flock fertility in Jordanian action sites; Medicinal plant cultivation reduces degradation and boosts household incomes; Conservation agriculture: higher yields, lower costs; Changing mindsets; Conservation Agriculture: Mediterranean saltbush: mitigating highly saline soils; A resilient, drought-tolerant forage species to alleviate feed shortages and feeding costs; The International Land Coalition (ILC), Tanzania Livestock Research Institute (TALIRI) and the International Livestock Research Institute (ILRI) developed participatory methods of mapping livestock routes. The tool was used to initiate the mapping of livestock corridors, markets and infrastructures in Tanzania and Kenya and to build the capacity of participants from government, community, NGOs, University and concern livestock departments. A resilient, pioneer plant for rangeland rehabilitation; A heavy, adaptable grass that provides high quality hay; Promoting Cactus as an alternative and sustainable livestock feed; Improving Jameed processing (Ar and En); Cactus pear utilization and management in English and Arabic; Integrated Crop-Livestock Conservation Agriculture for Sustainable Intensification of Cereal-based Systems in North Africa and Central Asia; Conservation Agriculture for Sustainable Intensification of Cereal-based Systems in North Africa (in Arabic); Conservation Agriculture and Livestock in the semi-arid regions of Tunisia (in Arabic); Orobanch control (Arabic version);</p>						

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
	<p>Integrated Crops-Livestock Conservation Agriculture for Sustainable Intensification of Cereal-based Systems in NorthAfrica and Central Asia (English and Arabic version); L'Agriculture de Conservation pour une intensification durable des systèmes de production céréalières en Afrique du Nord (French and Arabic version); Agriculture de Conservation et Elevage en zone semi-aride de la Tunisie (French and Arabic version); Five VegMeasure User's Manuals (Field data collection, Image Positioning Tool, Accuracy Assessment, Image Classification, Image Processing Using Algorithms); Booklet on safe grey water reuse at Households ; Productive use of grey water in home farming; Improving Jameed processing poster for producers (Ar and En); Enhancing sheep reproduction through cactus-based feed diets; Weed management guide for conservation agriculture (Arabic version); Local Knowledge Assessment Focusing on Climate Change and Gender Aspects (Jordan); Characterization of Zoghmar site: Diagnosis and analysis of the current situation; Diagnosis of the current situation of the hill lake watershed Kef Hamem; Conception technique du système de Recharge Artificielle de l'aquifère du Trias (Oum Zessar, Tunisia); Determining the saturated vertical hydraulic conductivity of retention basins in the Oum Zessar watershed, Southern Tunisia; Conception technique du système de Recharge Artificielle de l'aquifère du Trias (Oum Zessar, Tunisia); Report on agronomic activities in the Oum Zessar watershed, Southern Tunisia; Actes du Séminaire sur les Systèmes d'Information Géographique pour l'Etude de l'Environnement. Revue des Régions Arides; Policy Brief: barley subsidies in Jordan; A complete farm-household bio-economic model; The Practical Implementation of Conservation Agriculture in the Middle East; Development of conservation cropping systems in the drylands of northern Iraq; Barley-livestock systems - better climate change resilience for farmers: Assessing impacts of land policies on the production systems and livelihoods in the Southeast of Tunisia; Local knowledge of pastoral and agro-pastoral communities for managing uncertainties in Southeastern Tunisia- the case of Béni Khédache; System vulnerability analysis; The olive oil value chain in Béni Khédache, Southeastern Tunisia; Explanatory Report of Buffalo's Milk Value Chain in Egypt; Explanatory Report of Orange Value Chain in Egypt; Value chain analysis of tomatoes In Sharkia Governorate (Egypt); Analysis of the sheep value chain in Zoghmar community, Governorate of Sidi Bouzid (Tunisia); The onion crop situation in the zone of El Hajeb (Morocco) ; Situation of the potato crop (Morocco); Etude de faisabilité du projet d'agrégation pour la valorisation de l'oignon dans la zone d'El Hajeb (Morocco); Projet de valorisation de la culture de pomme de terre dans la zone d'El Hajeb (Morocco); Etude de faisabilité du projet ; Consommation énergétique des cultures d'oignon et de pomme de terre dans la province d'El Hajeb (Morocco). IBLI training and marketing materials.</p>						

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
5. % of tools that have an explicit target of women farmers	<p>2 Questionnaires for Community Members & labor service providers to access gender equity in decision-making, access to and control over household and non-household labor.</p> <p>2 Questionnaires addressed to agricultural and agroforestry products' collectors and processors including Men and Women, to access gender equity in decision-making, access to and control over household and non-household labor.</p> <p>Tool to analyze, barriers, drivers of change, interaction of social, ecological and market factors in their governance.</p> <p>Bio-economic modeling of farming systems using attribute from DS household survey, household analysis and technology adaptation strategies for gender to climate change in Andhra Pradesh and Karnataka.</p> <p>Cactus as multipurpose plant (Fodder, cash crop) ; Cactus as a sustainable and versatile plant for the dry areas; Reversing degradation in rangelands by promoting sustainable forage species; Grey water reuse at households; Enhancing the Dairy Processing Skills and Market Access of Rural Women in Jordan; Bio-economic model addressing gender issues in terms of division of labor, economic empowerment and nutrition; Workshop on olive harvesting in Karak; Local Knowledge Assessment Focusing on Climate Change and Gender Aspects.</p>	<p>- 57%</p> <p>Target was set in early 2014 considering only W1/W2 activities despite bilateral projects have less explicit target on women. The program cannot modify bilateral programs results. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.</p>	40%	45%	45%	19%	30%
6. % of tools assessed for likely gender-disaggregated impact		<p>- 77%</p> <p>Target was set in early 2014 considering only W1/W2 activities despite bilateral projects have less explicit target on women. The program cannot modify bilateral programs results. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.</p>	40%	45%	45%	10%	19%
7. Number of open access databases maintained by CRP	<p>Baseline for tradeoffs in crop residue uses, Zimbabwe, Malawi, Mozambique</p> <p>Baseline and typologies for Gwanda, Nkayi in Zimbabwe.</p> <p>Baseline and typologies for Changara and Manica in Mozambique.</p> <p>3 IBLI Marsabit Household Survey Data (1 data; 2 data; 3 data)</p> <p>2 IBLI Borena Household Survey Data (1 data; 2 data)</p> <p>Data sets: Baseline information of 1000 HHs from 3 Indian action sites and 6 districts (1,2,3,4)</p>	<p>+ 316%</p> <p>Target was set in early 2014 when a system to track bilateral projects results was not in place.</p>	5	9	6	25	15

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
	<p>On-farm Adaptive Varietal Trials Field experiments, Data base on soil and water chemistry, utilization of halophytes with marginal water in Koshkupur district, Aral Sea Action Site; dataset of 57 sustainable land management technologies and approaches applicable in Central Asia, Socio-economic semi-structured survey database (Komiljon Umarov WUA, Toshloq district, Fergana province, Uzbekistan); Database on irrigation, mechanical work, labour, using chemical protection, fertilizer use, yield, soil moisture, phenology and meteo (Fergana, Andijan); Dataset on water users for improvement institutional conditions of WUAs (Tajikistan, Uzbekistan); Database includes regional map, soil map and ground water level map of WUA K.Umarov (Fergana valley); Data base on demographic characteristics of households (financial, physical, natural and social capitals, agricultural production) (Fergana). SWAT modeling database (NCARE, Jordan and DG-ACTA, Tunisia); AFAWA Feed database; Climate change maps Iraq and Jordan (Iraq climate maps (Present), Iraq climate maps (Future scenarios), Jordan climate maps (Historical climate), Jordan climate maps (Current climate), Jordan climate maps (Projected changes)); Baseline survey for the characterization of the rural households, their resources and production systems and to identify the causes of system vulnerability and local coping mechanisms used by households and communities in the 4 sites (Jordan, Egypt, Tunisia, Morocco); Survey documenting gender inclusiveness in Jordan, Egypt and Morocco; Socio economic survey database on Marketing System for Olives and Olive Oil in Karak-Jordan, Beni Khedache, Tunisia, sheep in Zoghmar and vegetables in Nile Delta, Egypt and Meknes in Morocco; Animal nutrient deficiency: 100 wool samples were collected 50 feed samples and 100 blood samples (Jordan, Tunisia); Database containing household information and secondary data related to the small ruminant sector in Jordan; Database (Jordan, Tunisia) compiled with detailed information on agro-biodiversity status and threats in target monitoring areas in the action sites. There were more than 1000 data sessions that have been added to the Dryland Systems component of the ICARDA's Geoinformatics portal (open-access).</p>						
8. Total number of users of these open access databases		-25% Databases have been made public in last quarter of 2014 and number of user is expected to grow in 2015.	10,000	20,000	20,000	15,000	15,000

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
KNOWLEDGE, TOOLS, DATA							
9. Number of publications in ISI journals produced by CRP		+ 94% Target was set in early 2014 when a system to track bilateral projects results was not in place.	25	29	37	72	17
10. Number of strategic value chains analyzed by CRP	Maize, sorghum, groundnut, livestock, beef, dairy, camel milk value chains (Kenya). 2 value chain analysis with gender focus on cash & food crops and livestock (India). Feed resources assessment and technology prioritization studies (Draft report available) (India). Medicinal plant Sankhpushpi (Convolvulus pluricaulis) (India). Goat produce in Sogd province (CA). olives (fresh and oil) - Jordan (Al Erak). Tomato, Buffalo Milk, Citrus (Egypt). Onion, Potatoes (Morocco). Olive, Figs and Barbarine sheep (Tunisia: Zoghmar, Beni Khédache). Camel milk value chain in Kenya. Beef and dairy value chains in Mashonaland and Matebeleleland in Zimbabwe.	+ 68% Target was set in early 2014 when a system to track bilateral projects results was not in place.	5	7	7	22	18
11. Number of targeted agro-ecosystems analysed/ characterised by CRP	Mixed cropping systems, livestock systems, agroforestry systems, tree-crop-livestock systems (Kenya and Ethiopia); Agro-pastoral and mixed rainfed systems (India: Rajasthan); Intensive rainfed system and mixed crop-livestock systems (India: Andhra Pradesh and Bijapur), Mixed crop-livestock systems (Pakistan: Chakwal); Irrigated systems (Central Asia), mountain systems (Central Asia: Kyrgyzstan, Tajikistan), rangelands systems (Central Asia: Turkmenistan, Uzbekistan), rainfed systems (Central Asia); Marginal Lands: mixed crop-livestock feeding system, agroforestry with cereals and legumes (Central Asia, Aral Sea); Agropastoral system (Tafilah-Salamya, Jordan; Beni Khedache-Sidi Bouzid, Tunisia); Intensive rainfed system (Meknes Saiss, Morocco); Intensive irrigated system (Nile Delta, Egypt).	-28% Characterization of ALS has been reduced in the 3rd and 4th Quarters since the program extension proposal for 2015 and 2016 was not accepted and the funds for 2014 were reduced from 17 M to 15 M USD.	10	14	21	15	6
12. Estimated population of above-mentioned agro- ecosystems		-81.5% Please see explanation for Indicator n.11	400,000,000	600,000,000	600,000,000	110,910,000	110,800,000

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
CAPACITY ENHANCEMENT AND INNOVATION PLATFORMS							
13. Number of trainees in short-term programs facilitated by CRP (male)	Conflict management, integrated water resources management (IWRM), sustainable agriculture; improved agronomic practices, seed treatments and farm mechanization; integrated crop-livestock systems; Integrated and Soil Fertility Management (ISFM) technologies; wheat production packages; Integrated natural resource management (INRM); warrantage and composting in an integrated approach; Food feed crops; Livestock feeding, Groundnut seed production; soil/landscape, agronomy, socio-economic and crop management practices; Integrated nutrient management and IPM (context-specific package), agro-horti-forestry system; management of silvi-pasture systems; marketing system; Micro-irrigation system maintenance; irrigation scheduling; fertigation, organoleptic test for hybrids/varieties selection; soil test-based balanced plant nutrition; improved varieties; vermicomposting; soil & water conservation; value addition to fruits and vegetables; participatory varietal evaluation; spineless cactus and rangeland management; improved crop management technologies; soil fertility management. On-farm Adaptive Varietal ; On-farm Seed systems ; Knowledge Management; Gender mainstreaming to higher and sustainable income and well-being , crop modeling; Water user association management; Improving potato irrigation and cultivation in the field; Efficient water use at the level of WUA; Conducting survey/interview with water users; Agro-ecological Monitoring; Alley cropping system; Sustainable improvement on forage resources in drylands ; Phyto-ecological Data Analysis for Assessing Rangeland Productivity, promoting <i>in situ</i> /on-farm conservation of plant genetic resources, SWAT; Grey water reuse, Soil and water conservation techniques, Sheep breeding: introducing scientific methods to monitor and record flock performance ; surveys and data collection; Data entry; milk analysis, machinery; risk management; weed management; forage crops; Managing feed resources in Jordan's agro-pastoral production systems; Grazing Management under Water Harvesting Systems; Promote cactus pear as multiple purpose crop to improve the livelihood of the farmers; Rangeland and grazing management; Sheep and goats management; CA & cropping; Climate change mitigation; Farm management; Farm management; Olive Production; Organic Farming; Post-harvest; Small Ruminants Health; Tree Production; <i>Feed Assessment Tool (FEAST)</i> ; Integrated Crop-Livestock Conservation Agriculture: Wheat and forage in rotation; ZT Seeder Calibration.	-65% The activities planned in the last Quarter of 2014 were reduced in accordance with the budget cut from 17 M to 15 M USD. In addition several activities focus on smaller scale ToT intervention in order to strengthen NARS capacity. Funds were also allocated to long term training program to enhance capacities.	150,000	188,130	800,000	273,170	238,883
14. Number of trainees in short-term programs facilitated by CRP (female)	Integrated natural resource management (INRM); conflict management; improved agronomic practices, seed treatments and farm mechanization; integrated crop-livestock systems; Integrated Striga and Soil Fertility Management technologies; use of multi-purpose motorized groundnut oil mills; manual groundnut decorticators, and groundnut fryers; multicrop thresher and hammer mills; wheat production packages; warrantage and composting in an integrated approach; milk quality improvement; Integrated nutrient management and IPM (context- specific package), Agro-horti-forestry system; management of silvi-pasture systems; marketing system; micro-irrigation system maintenance;	-57% See comment to Indicator n.13.	30,000	44,370	200,000	85,697	71,330

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
CAPACITY ENHANCEMENT AND INNOVATION PLATFORMS							
	irrigation scheduling; fertigation, organoleptic test for hybrids/varieties selection; soil test-based balanced plant nutrition; improved varieties; vermicomposting; Soil & water conservation; fodder, value addition to fruits and vegetables; participatory varietal evaluation; spineless cactus and rangeland management; improved crop management technologies; soil fertility management; On-farm Adaptive Varietal , On-farm Seed systems ; Knowledge Management, Gender mainstreaming to higher and sustainable income and well-being , sustainable improvement on forage resources in drylands; Managing feed resources in Jordan's agro-pastoral production systems; Grazing Management under Water Harvesting Systems, promote cactus pear as multiple purpose crop to improve the livelihood of the farmers; Milk analysis; Rangeland and grazing management; Climate change mitigation; CA & Cropping, Aromatic and medicinal plants; Olive Production, Food processing.						
15. Number of trainees in long-term programs facilitated by CRP (male)		+17% The program favoured the reduction of short terms training to sponsor long term capacity development.	20	32	34	31 PhD; 9 MSc	11PhD 20 MSc
16. Number of trainees in long-term programs facilitated by CRP (female)		+300% See comment to Indicator n.15. In addition the Program initiated new activities in line with the Gender Strategy.	10	15	15	8 PhD 52 MSc	7 PhD 20 MSc
17. Number of multi-stakeholder R4D innovation platforms established for the targeted agro-ecosystems by the CRPs	1 IP in Bebeji, Kano, Nigeria. 2 IPs in Katsina, Nigeria. 3 IPs in Maradi, Niger. 3 IPs on wheat value chains. 4 IPs established in Burkina-Faso under BIODEV Total Land Care, LUNAR University, and Extension Officers within the different Extension Planning Areas. 3 IPs (private and public) on intensification and system's resilience. 12 village development committees (VDCs) focused on livestock improvement. SLM knowledge sharing web-platform " Knowledge 4 Sustainable Land Management " in Central Asia, Three national level IPs : sustainable and efficient water and land management, improve land (soil) productivity (Uzbekistan, Tajikistan, Kyrgyzstan)	+87.5% The investments in 2013 and high participation of local counterparts (cost-sharing) favored the established of more multi stakeholder R4D IP	15	24	24	45	26

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
CAPACITY ENHANCEMENT AND INNOVATION PLATFORMS							
	6 Learning Alliances on identification of entry point and opportunities for engagement (Tunisia, Morocco, Egypt, Jordan) 4 Innovation Platforms on regulatory permission to access and manage irrigation water (Jordan) , improving quality and range of public services (Jordan), Improving production potential and profitability for olives (fresh and oil), Tomatoes, Buffalo Milk and Citrus (Egypt), Onion and Potatoes (Morocco), Barbarine sheep, cactus, Olive, figs (Tunisia)						
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT							
18. Number of technologies/NRM practices under research in the CRP (Phase I)	21- chopping machine for green and dry fodder to reduce wastage; Strategic application of mineral and organic amendment; Optimal combination of hill applied mineral and organic fertilizers; Optimal time of application of organic manure in in-situ water harvesting for crop production (Niger and in Burkina Faso); Millet-groundnut cropping systems; Sorghum - groundnut cropping systems; Seed treatment; Legume-millet rotations for integrated Striga and soil fertility control in Gasoua and Zango; Legume-sorghum rotations for integrated Striga and soil fertility control in Gasoua and Zango; Animal drawn combine planter; Conservation agriculture with minimum tillage; Fertilizer use and crop rotation in sorghum based systems; Conservation agriculture with minimum tillage; Fertilizer use and crop rotation in millet based systems; Groundnut roaster; Integrated Crop and Pest Management technology/package; Sustainable wheat based crop rotation system (Kadawa, Kano); Strategic application of mineral and organic amendment; Optimal combination of hill applied mineral and organic fertilizers; Optimal time of application of organic manure in in-situ water harvesting for crop production (Niger, Burkina Faso); Farmer managed natural regeneration; Established mother blocks of improved cultivars; Established food bank based on Moringa and baobab. Four crop varieties (Kenya) and 4 rainwater harvesting techniques (Kenya). 9 technologies (Ethiopia: improved crop seeds, Bee hives, Maize thresher, improved animal breeds, locally better performing breeds, artificial insemination, FMNR, soil and water conservation structures, and tree seeds); 18 arresting degradation and rehabilitation of degraded lands; Enhancing productivity, Enhancing income Food feed crop and forage management; Mucuna as organic fertilizer and feed biomass, seed as source of income; Soil fertility management using crop rotation maize/sorghum, manure application; inorganic fertilizer, Livestock feeding of crop residue/forage mixtures; Groundnut seed production; CA - forages (East Shewa, Mozambique, Zimbabwe) and 11 High yielding bean varieties; Chicken manure; pigeon pea +maize intercrop; NP+S and NP+S +chicken manure in maize-beans intercrop; Insecticides and fungi- & bactericides for P&D control in beans; 21 Integrated crop management, improved cultivars, balanced nutrition; IPM; soil & water conservation ; millet, sorghum, chickpea, barley, cluster bean, moong bean, moth bean, maize, pigeon pea, groundnut, maize, lentil, cumin, barley & lentil under khadin system cultivated on conserved moisture; value medicinal plant Sankhpushpi (Convolvulus pluricaulis); water use efficiency; land rehabilitation; rangeland management options;	+ 227% Target was set in early 2014 when a system to track bilateral projects results was not in place. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.	40	47	52	170	74

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT							
	<p>NRM, improved species and governance mechanism for sustainable management of community based silvi-pastures systems; multi-purpose and arid fruit trees, soil analysis and mapping; soil test-based S, B and Zn interventions; evaluations of new varieties of groundnut, finger millet, soybean, sorghum, pearl millet, sunflower, castor; zero tillage; aerobic compost preparation techniques; Vermi-compost production techniques; biomass generation; water harvesting (India). Crop diversification -barley and chickpea (Pakistan), On-farm Adaptive Varietal Trials (50) improved genotypes of different crops (Central Asia), Livestock Productivity (Central Asia). Enhancing pastoral resources using different water harvesting techniques in Al- Majidyia site (Jordan); Enhancing pastoral resources using water harvesting techniques and direct seeding in El Bhaier (Beni Khedache, Tunisia); Harvesting machines for small-scale olive producers (Jordan), Second prototype of small Rama seeder produced and tested at Mushagher (Jordan) and Palestine, Manufacturing local low-cost seeders in Algeria, Morocco and Tunisia, Enhancing the Dairy Processing Skills and Market Access of Rural Women in Jordan, Development of a raisedbed machine together with a full technical, Water and Salinity management to combat land degradation;</p> <p>Establishment of cactus gene bank for screening cold tolerant and multi-purpose species (discovery phase) linked to CRP 7 (Jordan); Establishment of alley cropping (on station and on farm). (proof of concept phase) (Tunisia, Jordan); Introduction of new crops (Medicinal and Herbal Plants) that were not traditionally cultivated in Karak (Crocus, Salvia, Thymus) (Jordan); Application of integrated pest management for olive trees, At least 5 promising fodder species have been identified and characterized to reverse the devastating levels of degradation that inflict many rangeland areas (Tunisia); Cereals and food legumes-Adaptation (Morocco); Cereal and legumes-IPM (Morocco); Ffertility strategy (Nile Delta); fertilization management (Nile Delta) Promote cactus pear as multiple purpose crop to improve the livelihood of poor farmers in West Asia (discovery phase); The Influence of Soil Volume (Root Confinement) on Root and Canopy Growth, Root Turnover and Canopy vs Root Ratio of Opuntia ficus-indica (L); The influence of planting methods of Opuntia ficus-indica (L) on root and canopy growth, root turnover and canopy – root ratio; Sustainable development of lowlands in pastoral systems (proof of concept); Management and cultural practices of cactus (Jordan); Better understanding of the highly diversified weed flora in three experimental sites; Conservation agriculture: impact on increased soil organic matter biodegradability due to higher crop residues under CA and increased soil stability in Jordan, Tunisia and Morocco. Identify constraints to adoption of CA smallholder farmers and ways of enhancing adoption; Identify and test improvement in seeding machinery, and in weed and biomass management of CA systems; Supplemental irrigation on cereals at Zoghmar, Tunisia; Alley cropping system with cactus as alleys, Zoghmar, Tunisia; Use of remote sensing (Tunisia); Livestock management; Community-based selection of improved rams; Documentation of ethnopractices assessing the naturel vegetation resources on animal health status;</p>						

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT							
	<p>Identification of sheep flock management practices to meet lamb markets demand; mapping of the diversity of animal production systems across the action site documenting species (Tunisia); Determination of nutrient deficiencies in small ruminant flocks (Tunisia); Seasonal characterization of the small ruminants feeding system in the action site (Tunisia); Current feeding calendar and gaps analysed for nutrient deficient for improving (Tunisia); Determination of water footprint and water productivity of animal products (Tunisia); Development of non-destructive technique for estimating biomass (proof of concept); Assessment and monitoring of rangeland health and trend in NAWA region (VegMeasure); Smart phone app for vegetation canopy cover estimation which could be used as a main input for an early warning system (discovery phase); Data compiled from different sources to form The PREDICTS database: a global database of how local terrestrial biodiversity responds to human impacts; A complete farm household bio-economic model; Comprehensive description of the production systems and livelihoods, with major indicators of the socio-economic and biophysical aspects of production systems of 6 field-sites in Morocco; Cereal aggregation in in Meknes, Morocco.</p>						
19. % of technologies under research that have an explicit target of women farmers		- 66% Target was set in early 2014 considering only W1/W2 activities despite bilateral projects have less explicit target on women. The program cannot modify bilateral programs results. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.	40%	45%	45%	36%	19%
20. % of technologies under research that have been assessed for likely gender-disaggregated impact		N/A	5%	8%	10%	10%	49%

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT							
21. Number of agro-ecosystems for which CRP has identified feasible approaches for improving ecosystem services and for establishing positive incentives for farmers to improve ecosystem functions as per the CRP's recommendations	Mixed cropping systems, livestock systems and agroforestry systems (Burkina Faso, Mali and Niger). Agro-pastoral and mixed system (India: Rajasthan and Jodhpur). Agroforestry (4), Rangelands improvement (3), Halophytes arid fodder production(1), and Crops Diversification (1) (Central Asia: Aral Sea); Vulnerable Areas , Intensified systems , Mountains Dryland (Central Asia: Aral Sea, Fergana Valley, Rasht Valley); 4 agricultural systems (1 SLM for each system) in Central Asia. Agropastoral system (Tafilah-Salama site, Jordan – Beni Khedache-Sidi Bouzid site, Tunisia); Intensive rainfed system (Meknes Saies site, Morocco); Intensive irrigated system (Nile Delta site, Egypt).	+ 53% Target was set in early 2014 when a system to track bilateral projects results was not in place.	10	14	15	23	4
22. Number of people who will potentially benefit from plans, once finalised, for the scaling up of strategies		-90% The potential number was set at regional level while the program has revised its area of intervention.	500,000,000	650,000,000	800,000,000	74,713,000	74,000,000
23. Number of technologies /NRM practices field tested (phase II)	Rainwater harvesting, drought tolerant crops (sorghum and millet) - Burkina Faso and Niger. 1. Raised bed planting for irrigated systems , Agroforestry for mountain systems , Pasture improvement for rangelands systems , Conservation agriculture for rainfed systems , 2 Newly released and pre-released varieties of crops , Wheat-Mungbean and wheat-potato rotation (Central Asia). Introduction and adoption of innovative technique of soil and water conservation technique: Valerani, Continues / Intermittent Single-furrow Plowing Implement (adopted by national development institutions) in Jordan; Introduction and adoption of innovative technique of soil and water conservation technique: hill lakes (Jordan, Tunisia); Introduction and adoption of innovative technique of grey water reuse: ICARDA's design for grey water units implemented and scientists and beneficiaries trained (Jordan, Tunisia); Introduction and adoption of innovative technique of soil and water conservation technique Semi-Circular Bunds (Jordan, Tunisia); Introduction and adoption of innovative technique of soil and water conservation technique Check dams for aquifer recharge and plantation (Jordan, Tunisia);	+ 70% Target was set in early 2014 when a system to track bilateral projects results was not in place. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.	40	48	34	58	46

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT							
	Introduction and adoption of innovative technique of soil and water conservation technique Terraces: Terraces are constructed on sloping land to reduce soil erosion and retain runoff water (Jordan, Tunisia). Combining water harvesting techniques and Supplemental irrigation (Tunisia); Irrigation water deficit and Irrigation water scheduling (Tunisia, Morocco); Implementation of hill lake (capacity of 7,000 m3) with farmers' initiative and support from NCARE & ICARDA, cultivation of barley and vegetable crops and data collection (Jordan); Prototype ZT seeders completed, On farm dissemination of high yielding cactus pads (dissemination phase) (Jordan); Rangeland rehabilitation; Application of integrated pest management for olive trees; Salinity and orobanche tolerant fababean cultivars were identified and disseminated; Three lentil genotypes; Management and cultural practices of cactus (Jordan); Enhancing pastoral resources using different water harvesting techniques (Jordan); <u>Flexible crop production packages</u> that emphasized ZT as the most important principle of CA; Supplemental irrigation package on wheat in the outscaling site of Tadla: Supplemental irrigation of cereals in Zoghmar, Tunisia; Alley cropping system with cactus as alleys in Zoghmar, Tunisia; Remote sensing in Zoghmar, Tunisia; Livestock management; Use of milk fat separator in Jordan (Milk fat separation is an essential step in Jameed manufacturing; Livestock health services; Local knowledge and traditional ethno-veterinary practices; Prepare silage from corn and sorghum stalks increased farmers' income, availability of animal forage in summer with higher nutrition value and saved environment from burning corn and sorghum residues in Egypt.						
24. Number of agro-ecosystems for which innovations (technologies, policies, practices, integrative approaches) and options for improvement at system level have been developed and are being field tested (Phase II)	Mixed cropping systems, livestock systems and agroforestry systems (WAS); Irrigation dugouts for improving soil and water storage for livestock and crop production (SA), Intensive systems and Agro-pastoral systems (Central Asia: Fergana - Uzbekistan and Sugd in Tajikistan, Aral Sea - Karakalpakstan and Khorezm provinces of Uzbekistan); 4 agricultural systems - SLM tested (Central Asia: Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan); Agropastoral system (Tafilah-Salama site, Jordan - Beni Khedache-Sidi Bouzid site, Tunisia); Intensive rainfed system (Meknes Saies site, Morocco); Intensive irrigated system (Nile Delta site, Egypt).	+ 300% Target was set in early 2014 when a system to track bilateral projects results was not in place.	15	18	3	12	3

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT							
25. % of above innovations/approaches/options that are targeted at decreasing inequality between men and women		- 75% Target was set in early 2014 considering only W1/W2 activities despite bilateral projects have less explicit target on inequality. The program cannot modify bilateral programs results. The Program Research Management Committee should revise bilateral projects and decide to map only those in line with its strategic objectives.	20%	20%	20%	5%	4%
26. Number of published research outputs from CRP utilised in targeted agro- ecosystems		+ 45% Target was set in early 2014 when a system to track bilateral projects results was not in place	40	54	53	77	81
27. Number of technologies/NRM practices released by public and private sector partners globally (phase III)	Multipurpose motorized groundnut mill; Groundnut roaster; Farmer managed natural regeneration; Established mother blocks of improved cultivars; African Market Garden; Hybrid model for weather based crop and livestock insurance in a PPP mode; Milk fat separator; Zero till seeders, Small scale olive harvester; Improved rams; Small ruminant feeding practices; Small ruminant health control; Community-based seed production; Conservation agriculture practices; Supplemental and deficit irrigation; Cactus production and transformation.	+ 14% Target was set in early 2014 when a system to track bilateral projects results was not in place	5	7	7	8	5

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
POLICIES IN VARIOUS STAGES OF DEVELOPMENT							
28. Numbers of Policies/ Regulations/ Administrative Procedures Analyzed (Stage 1)	Evidence generated on CPRs management, Khadin system, agri-horti systems, crop-livestock issues. Policy analyzed. Rural advisory service providers analysis completed (Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan). Impact analysis of water harvesting techniques (WHT) on rural livelihood conditions under climatic and socio-economic scenario and profitability of investing in WHT in Oum Zessar, Tunisia. Assessment of cereal producers in Meknès-Tafilalet region (Morocco); Solar energy a viable option to replace liquefied petroleum gas (Morocco) The Moroccan wheat Sector (Morocco); The wheat seed system in Morocco. Barley subsidies in Jordan: The effects on small ruminant production, food security and development of the livestock sector (Jordan); Groundwater tariffing policy (Jordan); Farmers' perceptions of water policies and development projects: A case study from Jordan; Land policies, production systems and livelihoods in South-East Tunisia. ICARDA's promising technologies and implications for policies needed to enhance CWANA regional food security under alternative future climate scenarios.	+ 300% Target was set in early 2014 when a system to track bilateral projects results was not in place.	1	3	3	12	5
29. Number of policies / regulations / administrative procedures drafted and presented for public/stakeholder consultation (Stage 2)		- 200% The political instability in target countries did not allow further step in the policies' process.	0	0	2	0	0
30. Number of policies / regulations / administrative procedures presented for legislation(Stage 3)	The IAR4D approach is in the process of being entrenched in the National Agricultural Policy. At the moment it is entrenched in "The Agriculture Sector Wide Approach (ASWAp)" and only guides agriculture extension in Malawi as a whole.	+ 100% the political process in the target country processed the draft consultation faster than expected.	0	0	0	1	0

Indicator	Description of Activities and Products measured by Indicator	Deviation narrative (+/- 10%)	2013 Target	2013 Actual	2014 Target	2014 Actual	2015 Target
POLICIES IN VARIOUS STAGES OF DEVELOPMENT							
31. Number of policies / regulations / administrative procedures prepared passed/approved (Stage 4)		N/A	0	1	0	0	0
32. Number of policies / regulations / administrative procedures passed for which implementation has begun (Stage 5)		N/A	0	0	0	0	0
OUTCOMES ON THE GROUND							
33. Number of hectares under improved technologies or management practices as a result of CRP research	East Shewa, Mozambique (continuation), Zimbabwe (continuation and expansion). India (Karnataka, Andra Pradesh, Bhoochetana) and Pakistan. Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan). West Asia and North Africa (Morocco and Tunisia).	+88% The high participation of local counterparts (cost-sharing) favored the expansion of agricultural packages as provided by NARS.	3,000,000	4,000,000	4,000,000	7,525,065	7,051,850
34. Number of farmers and others who have applied new technologies or management practices as a result of CRP research	Mali, Niger, Nigeria, Burkina Faso, Ghana East Shewa, Mozambique, Zimbabwe, Marsabit, Isiolo, Wajir, Borana India, Pakistan Jordan, Tunisia, Morocco, Egypt (a) number of women farmers concerned (b) number of male farmers concerned	-88% The target was based on National Program supposed to expand CRP packages. The actual and 2015 target have been determined by direct intervention of the program without scale-out information	3,000,000	4,000,000	4,000,000	a) 117,348 b) 352,000	a) 153,430 b) 358,005

Annex 2: Performance indicators for gender mainstreaming with targets defined

Performance Indicator	CRP performance approaches requirements	CRP performance meets requirements	CRP performance exceeds requirements
1. Gender equality targets defined	<p>Norms study acts as a benchmark to monitor the progress of the CRP (NAWA)</p> <p>Gender performance indicators and sex-disaggregated social data collected to diagnose important gender-related constraints in water use efficiency and needs assessments in marginal lands (CA)</p> <p>The sex-disaggregated household and agrobiodiversity database to understand gender roles and relations and develop strategies to empower women (SA)</p>	<p>Gender disaggregated information generated as part of baseline characterization of the action sites/research activities, participation in decision making and access and control, household vulnerability analysis, quantification of risk in technology adoption and climate change impact on gender vulnerability (SA, CA, ESA, NAWA)</p> <p>Tools developed and gender strategic research done on gender equity in decision-making, access to and control over household and non-household labour, on gender differences in work conditions of agricultural labourers, and wage gap (WAS, NAWA)</p> <p>Data on inequalities in value chains with focus on cash & food crops and livestock for out-scaling of gender-responsive value chain interventions (NAWA, SA)</p> <p>The methodological framework adopted to assess agricultural biodiversity and dietary diversity is gender disaggregated (WAS, SA, ESA).</p>	<p>Sex-disaggregated social data collected and used to diagnose important gender-related constraints in at least one of the CRP's main target populations.</p> <p>The CRP has defined and collected baseline data on the main dimensions of gender inequality in the CRP's main target populations relevant to its expected outcomes (IDOs).</p> <p>CRP targets changes in levels of gender inequality to which the CRP is or plans to contribute, with related numbers of men and women beneficiaries in main target populations.</p>
2. Institutional architecture for integration of gender is in place	<p>CRP scientists and managers with responsibility for gender in the CRP's outputs are appointed, have written TORS.</p> <p>Procedures defined to report use of available diagnostic or baseline knowledge on gender routinely for assessment of the gender equality implications of the CRP's flagship research products as per the Gender Strategy</p> <p>CRP M&E system protocol for tracking progress on integration of gender in research is in development</p>	<p>CRP scientists and managers with responsibility for gender in the CRP's outputs are appointed, have written TORS and funds allocated to support their interaction.</p> <p>Procedures defined to report use of available diagnostic or baseline knowledge on gender routinely for assessment of the gender equality implications of the CRP's flagship research products as per the Gender Strategy</p> <p>CRP M&E system has protocol for tracking progress on integration of gender in research</p> <p>A CRP plan developed, not yet approved for capacity development in gender analysis.</p>	<p>CRP scientists and managers with responsibility for gender in the CRP's outputs are appointed, have written TORS and funds allocated to support their interaction.</p> <p>Procedures defined to report use of available diagnostic or baseline knowledge on gender routinely for assessment of the gender equality implications of the CRP's flagship research products as per the Gender Strategy</p> <p>CRP M&E system has protocol for tracking progress on integration of gender in research</p> <p>A CRP plan approved for capacity development in gender analysis.</p> <p>The CRP uses feedback provided by its M&E system to improve its integration of gender into research.</p>



RESEARCH
PROGRAM ON
Dryland Systems

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

drylandsystems.cgiar.org

Led by:



In partnership with:

