



RESEARCH
PROGRAMON
Dryland Systems

Responses to Task Force on Mission Critical Research Areas for Drylands

17 April 2015

*Food security and better livelihoods
for rural dryland communities*

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A. Preamble

The CGIAR Research Program (CRP) on Dryland Systems (hereinafter referred to as Dryland Systems) welcomes the Task Force report to the Fund Council on mission critical research areas for drylands. The report is the first of four objectives that the Task Force has been commissioned to undertake on behalf of the Dryland Systems. This follows the commentary and requests from the Consortium Office of July 14, 2014 and the Consortium Board Chair of 8 August, 2014 and the approval of an extension proposal pending compliance with the Consortium Board requests.

The Dryland Systems program and the Lead Centre, ICARDA, have responded to the criticisms received by reviewing and re-organizing its organizational structure against the background of the commentary from the ISPC and Consortium Office, the new Strategic Research Framework and its linkages to the Sustainable Development Goals, the new portfolio of CRPs with an expected reduction of numbers from 15 to 8-10 and the significant reductions in W1+W2 funding over the last 6 months or so.

B. The Response

At its second annual Science and Implementation meeting held in ICRISAT April 7-9th, 2015, the program agreed to a definition of systems research as:

Systems research is a holistic approach that integrates components of human and agro-ecological systems across all dimensions in order to improve agricultural livelihoods in drylands.

Our systems approach is best defined in terms of the outcomes we seek meaning that we apply a systems approach to improve food security, reduce poverty and enhance the natural resource base in drylands. This does not pre-judge the need for a technology, a commodity-related intervention or a disciplinary consideration of “hard” versus “soft” sciences. The research in all contexts draws upon diverse sources of local and scientific knowledge recognizing that farmers employ systems approaches to their decision making.

Succinctly our systems approach;

- Provides a comprehensive understanding, diagnosis, targeting & decision making
- Develops appropriate technologies, practices, institutions and policies
- Facilitates scaling up and out
- Improves stakeholders engagement, capacity and innovation
- Instills monitoring & evaluation towards sustainability
- Justifies and provides evidence for increased investments in drylands

Following its first Science and Implementation meeting held June 30-July 4, 2014, the CRP has also developed a value proposition that aims to improve the livelihoods, nutrition and environment of up to 100 million rural poor in drylands and the improved use of up to 190 million ha of degraded land by 2030.

C. Value Proposition for Drylands Research

The Dryland Systems program supersedes the piecemeal approach that has dominated drylands research by embracing both horizontal and vertical systems integration across sectors and scales. This approach explicitly takes into account the economic, social and environmental co-benefits needed to achieve viable livelihoods, and ensure social and environmental well-being.

It strengthens the science-policy interface that has prevented governments and international bodies from delivering improvements on the ground to benefit rural people. An integrated approach is necessary to identify opportunities for the agricultural sector in concert with the development of water and renewable energy resources, in the context of a new generation of national development plans that can reverse the chronic lack of investment in dryland areas.

The Dryland Systems program develops and tests, with development partners, feasible combinations of technical, market, governance and policy options capable of kick starting and sustaining improvements in agricultural livelihoods by understanding the social, financial, technical and environmental contexts for which they are appropriate, thereby generating a knowledge base for better targeting interventions.

New science is being applied in systems research to generate innovations on how to cope with climate change, water scarcity and land degradation at the expected scale of impact; that is, with millions of farmers across millions of ha of dryland. This is achieved through forging partnerships that can use planned comparisons in large trials, with crowd-sourced data for monitoring and evaluation, bringing recent developments in information science and technology to bear on the problems of the poor and vulnerable.

Systems innovation platforms are being fostered that add to value chains, encouraging diversification and local income generation by harnessing local and 'scientific' knowledge. This new 'research in development' approach will directly improve the effectiveness of development spending at local scales, at the same time as producing generalizable knowledge, forging new partnerships, and building the capacity of people and organizations that will impact development of livelihood systems across the global drylands.

We note that aspects of this value proposition have been incorporated into a generic systems approach to be taken by the three existing system CRPs following the international conference on integrated systems March 3-6, 2015 at IITA Ibadan, Nigeria.

We also note that this value proposition corresponds well with the proposed systems research approach for drylands as outlined in Table 1 of the Task Force document.

D. Mission Critical Research Areas

With respect to the three mission critical research (MRC) areas defined by the Task Force, we respond accordingly:

MCR area 1: Anticipating dryland futures

Although much emphasis was given to diagnosis of the demands and problems with partners in the original CRP proposal we recognize and appreciate the greater emphasis given to foresight analysis by the Task Force using methods such as scenario building and outcomes such as plausible future scenarios for investment plans. The Dryland Systems program believes that it is important to reverse the rhetoric of drylands being apocalyptic scenes of despair to raising the vision of better opportunities for dryland inhabitants. Indeed the program has recently produced more refined maps of crop yield potential in tropical and non-tropical drylands and related them to population numbers. This is part of the work to better target interventions and develop scenarios for investment plans. Bio-economic modelling reported by the Dryland Systems program contributes to this area.

MCR area 2: Co-producing knowledge for win-win options

The idea of win-win options is perhaps better tempered by a recognition that there are usually trade-offs in any intervention that need to be understood considering both system internal and

external effects. The main focus of current Dryland Systems efforts is on developing and testing - with farming households and development partners - feasible combinations of technical, market, governance and policy options capable of improving agricultural livelihood systems. For example in 2014 over 50 sustainable land management options were under testing. The focus is on total farm productivity - including closing yield gaps of system components.

The program is developing monitoring and evaluation frameworks for trade-off analysis with appropriate system-level indicators that capture change and rate of change for whom, where, to what extent and how to support land users' adaptive management and donors' requirements. This requires continuous knowledge sharing, learning and capacity building of all participants including farmers and research staff and their organizations.

New science in combination with systems research offer novel approaches to deal with wicked problems, productivity trade-offs and synergies, climate change, land degradation, gender inequities, and youth unemployment. Examples include the introduction of index-based livestock insurance schemes and potential options for use of information and communication technologies to attract youth into productive rural employment. The program sees the opportunities to introduce such innovations into rural areas where small to medium towns are rapidly growing and where there are possibilities to contribute to the development of local clusters of economic activity linking agriculture with other livelihood options such as renewable energy, water provision, tourism and prospecting for high value products from the available biodiversity in drylands.

MCR area 3: Facilitating policies, institutions and governance for scaling and enabling innovation

Dryland Systems recognizes that inadequate institutions and governance are major limitation to progress in the dryland areas and therefore welcomes the Task Force's emphasis on these areas. Clearly greater interaction and collaboration on this topic is necessary between the existing CRP on policies, institutions and markets (PIM), CCAFS and drylands.

The program also believes that there are opportunities to elevate the issues of drylands and role of the CGIAR into the international arena by greater interaction with bodies at regional and international level such as the three United Nations Conventions on the Environment (UNCCD, UNFCCC and CBD). This has started for example, through greater presence at the 3rd scientific conference of the UNCCD and participation in the global initiative on the Economics of Land Degradation.

Through its innovation platforms the Dryland Systems program is bringing partners together including the private sector and this should be accelerated through engagement with development agencies. Knowledge and learning alliances are being strengthened by partnering with specialized research organizations from within and outside the program regions. Promoting the Dryland Systems' integrated research sites as platforms for post-graduate training will also be a priority, formulating teams from developing and developed country institutions as part of the inter-disciplinary research teams that are operating in current flagship program action sites and transects.

E. Cross-cutting Initiatives by Dryland Systems

We wish to emphasize that the Dryland Systems program, in its role as a convenor, has developed five working groups (WG) to bring greater coherence to the program. These are on systems analysis, geo-informatics and data management, knowledge sharing and communications, gender and youth, and capacity development. Strategy documents are available for gender, youth, and capacity development. These working groups are composed of

staff from participating centres and their partners. Workshops have been held where each group has determined its terms of reference, elected a chair and developed work plans. These WGs groups can be extended to other CRP's or join similar WG or communities of practice (CoP) across the CGIAR (i.e., become system-level activities). We see a particular need to reinforce the systems analysis group by linking to other CRP's and external specialized research organizations.

Dryland Systems has developed an on line [Monitoring, Evaluation and Learning \(MEL\)](#) system to ensure the result-based management of the program, as well as facilitate knowledge sharing and learning. One regional organization in West Africa, CORAF, and two other CRP's have expressed interest in this system and training is being undertaken on the beta version.

F. Re-Organization of Flagships according to New Research Framework and Process

Dryland Systems has been re-organizing its focus around agricultural livelihood systems (ALS) defined as the set of farm, farming and human activity systems that determine the livelihood opportunities for agricultural households, enterprises or communities. Originally the program had identified 5 major ALS: pastoral, agro-pastoral, rainfed, tree-based and irrigated crops. Based on rainfall and aridity indices and the changing focus of farmers, yield potentials and populations, the program will concentrate its efforts on three ALS namely:

1. Pastoral/agro-pastoral systems
2. Rainfed systems
3. Irrigated systems

Within each of these ALS, research hypotheses exist or are being formulated to respond to the grand challenges for drylands that could form the basis for flagship projects in the new CRP portfolio. The following table represents these.

Grand challenges in drylands	Agricultural livelihood systems		
	Pastoral/ Agro-pastoral	Rainfed crop- livestock	Irrigated crops
Climate change	xxx	xxx	x
Water allocation & management under scarcity	xx	xx	xxx
Land degradation	xxx	xx	xxx
Institutions & governance	xxx	xx	xx
Market access	xxx	xxx	xx
Gender equity & youth employment	xx	xx	xxx
Production intensification & diversification	xx	xxx	xx

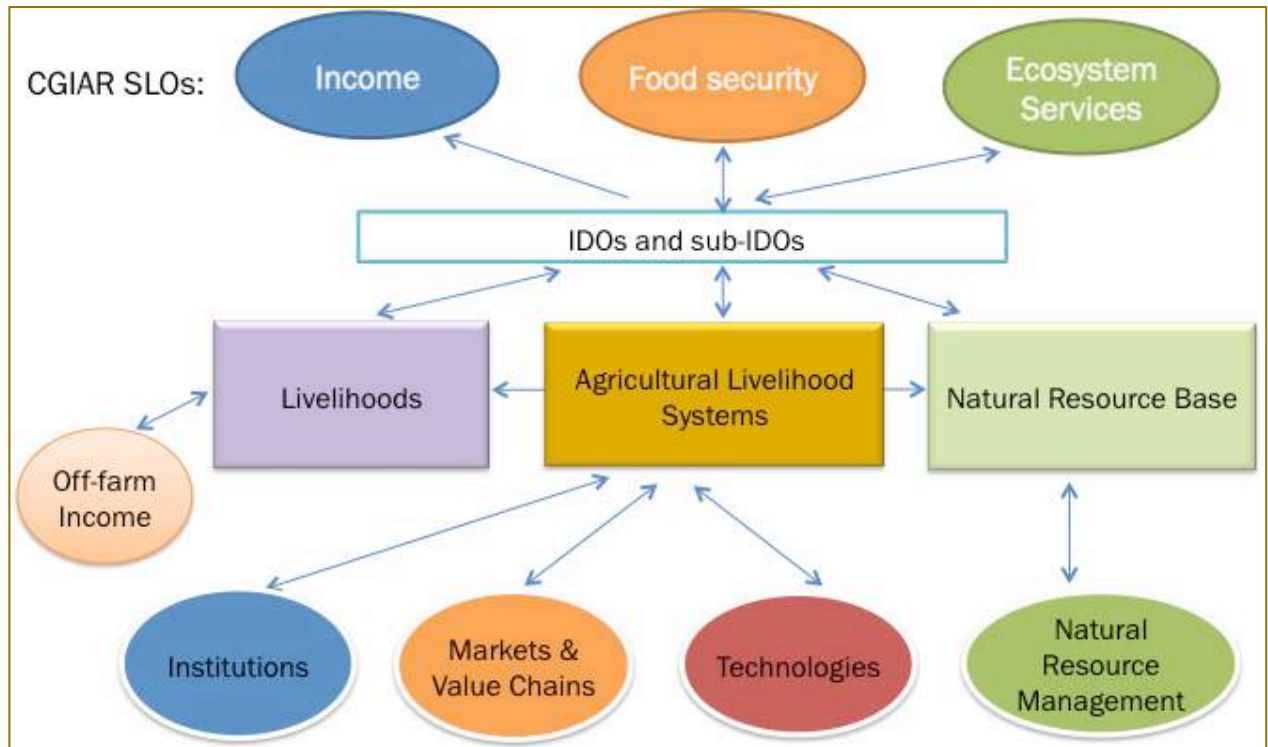
Relevance: x = some; xx significant; xxx= highly relevant

The conceptual framework developed for drylands research is shown below. Research activities on production, technologies, markets, institutions and natural resource management are

undertaken at the agricultural livelihood level with consideration of the interactions between livelihoods and the natural resource base, including off-farm income generation. Outputs from this research contribute to the system level outcomes.

E. New Research Framework for Development Outcomes

Conceptualization of a Framework for Dryland Agricultural Livelihood Systems and Outcomes





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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

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