

Review of agriculture in the dry areas **Caravan**

Gender focus:
prioritizing the needs
of women farmers

Closing gender gaps; delivering support and new innovations; raising yields and incomes

- A new gender strategy for the dry areas
- Policies to support women farmers
- Rural women's cooperatives – can they deliver?
- New extension models – improving the support delivered to women farmers
- Capacity strengthening with a gender dimension

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ISBN: 92-9127-479-8
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Editorial support and
layout by Scriptoria
(www.scriptoria.co.uk)

Caravan is published by ICARDA.

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A commitment to women farmers – for the benefit of all

According to the United Nation's Food and Agriculture Organization (FAO), women now make up 43% of the world's agricultural labor force. In response to this increasing 'feminization' of agricultural production, ICARDA and CGIAR have included gender in all aspects of their research programs to ensure that knowledge generated will have a positive and equitable impact on both men and women.

This approach reflects not only a moral imperative, but an acknowledgement that gender equality makes economic sense for sustainable development. Without closing existing 'gender gaps', or enhancing women's access to new innovations, agricultural production systems cannot reach their full potential. We also risk jeopardizing the future of the next generation.

In this issue of *Caravan* – a collaborative effort with the CGIAR Research Program on Dryland Systems – we focus on gender-related research being undertaken by ICARDA and national and CGIAR research partners across the world's dry areas, reflecting on experience and insights from Morocco to South Asia and beyond.

Articles cover proven extension models that are successfully delivering new technologies and innovations to women farmers; capacity-strengthening initiatives that are helping biophysical scientists to incorporate gender into their research more effectively; insights into the performance of rural women's cooperatives and how these organizations can be strengthened; and success stories from across CGIAR – including initiatives to improve dairy production in Jordan, raise the productivity of women livestock producers in Afghanistan, and deliver gains to female cactus producers in Egypt.

This issue also discusses the new gender strategy of CGIAR Research Program on Dryland Systems, an ambitious plan that sets out the challenges and targets for addressing gender issues as a core activity of this ICARDA-led program.

At the heart of these initiatives lies a commitment to gender equity and an inclusive form of agricultural development designed to deliver maximum impacts – not only for women, but for rural communities in general.



Mahmoud Solh
Director General, ICARDA



A gender strategy for the dry areas

Photo: Dryland Systems

A new gender strategy sets out the challenges and targets for addressing gender issues as a core activity of the CGIAR Research Program on Dryland Systems.

WHY IS A GENDER STRATEGY NEEDED?

Agricultural livelihood systems consist of many interactions between the natural and social environments. Gender relations help to shape, and are shaped by, these interactions. In many dryland communities, socio-cultural norms and values disadvantage women. Discrimination against women, whether direct or indirect, is a human rights issue in its own right. It also makes agricultural value chains less productive than they could be, undermining prosperity and well-being.

In recognition of these realities, the CGIAR Research Program on Dryland Systems has developed a gender strategy for 2014–2017. The strategy is helping Dryland Systems researchers to strengthen the systems approach to improving dryland food security, livelihoods, and resilience.

WHAT IS THE GOAL?

The goal of the strategy is twofold: to promote gender equality (especially regarding socio-economic, legal, and political rights) and improve women's access to, and control over, resources such as land and income.

Achieving this goal means:

- Developing a systems approach that takes gender differences into account from the start
- Building Dryland Systems researchers' understanding of the context-specific factors that underlie gender inequalities across the regions where the initiative works, and identifying ways of addressing them
- Helping to design systems interventions that increase women's participation in decision-making and strengthen their resilience and well-being –

by, for instance, developing technologies to reduce women's drudgery

- Ensuring that women get a fairer share of increased production and income, by strengthening their capacity to independently manage income generation, and creating technologies that meet women's needs.

PUTTING THE STRATEGY INTO PRACTICE

For Dryland Systems to achieve its gender goal, researchers must understand and address gender differences in every stage of their studies. This is vital, because men and women in dryland communities often have divergent roles, responsibilities, needs, and interests in relation to agricultural livelihoods.

Other social factors, such as wealth or ethnicity, cut across

these gender differences and also need to be considered. Such analysis can be complex, but including it as a matter of routine in dryland systems research is neither a distraction nor a luxury. Rather, it is an essential part of good-quality research. For instance, Dryland Systems researchers are already finding that the gender strategy can help them to produce new, cutting-edge thinking on systems analysis and modeling.

In practical terms, what techniques can researchers use to improve their understanding of how gender relations shape dryland systems? A necessary first step is to investigate the livelihood needs and interests of individual male and female household members during surveys, rather than simply treating households as homogenous units. A household-level survey is likely to result in a partial and distorted picture of the livelihood system in a community. Interviewing men and women separately, on the other hand, enables more accurate and fine-grained assessments, illuminating such issues as access to assets and gender gaps in crop and livestock value chains.

Another necessary first step is an interdisciplinary qualitative systems analysis that allows the identification of different trade-off calculations for women and men linked to the adoption of new technologies and other innovations, regarding issues such as labor, family nutrition, and income generation and use.

Along with integrating gender, specific targeted research will be conducted that aims to explore important questions about how gender differences shape dryland systems, such as:

- What part do gender wage and earning gaps play in agricultural systems?
- What are the differences

between men's and women's approaches to water management?

- How can women increase production of traditional crops and gain control of the resulting income?
- What legal changes are required to help women to become independent farmers, managers, and entrepreneurs? A Dryland Systems study in Egypt, for instance, suggests that women with land titles have more say in decision-making in households, communities, and local institutions.

Comparative studies will help the target regions of Dryland Systems to learn from each other, building knowledge of the cultural, ideological, and institutional factors that create and sustain gender equality.

NO OPTION B

The Dryland Systems gender strategy is ambitious. For many Dryland Systems researchers with expertise in the biophysical rather

than social aspects of agricultural systems, putting it into practice will require a profound change of mindset. Yet, for Dr. Karin Reinprecht, the Dryland Systems Gender Program Coordinator, there is no alternative: "Ignoring gender issues in dryland systems is just not an option any more. In the precarious situations that we see in many dryland areas, communities can only hope to thrive if they empower *all* their members, irrespective of gender, age, or other social characteristics, to fully contribute to and benefit from agricultural systems. Because of their very nature, dryland communities cannot afford to continue with the gender *status quo*."

WHAT CHANGES CAN WE EXPECT TO SEE?

The gender strategy covers the period 2014–2017. During that time, Dryland Systems plans to support women in its target areas to:

- Engage in entrepreneurial activities for high-value commodities
- Use agricultural innovations, information, finance, and other resources to increase their incomes
- Benefit from markets more easily
- Obtain access to agricultural extension and veterinary services.

Successes like these will generate substantial gains for dryland communities as a whole, as well as for their female members.




Photo: Dryland Systems

The goal of the strategy is twofold: to promote gender equality and improve women's access to, and control over, resources.

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The pros and cons of paid farm work for women

In many parts of the Global South, recent years have seen unprecedented numbers of women taking up paid farm work. Scientists from ICARDA and the International Water Management Institute (IWMI), through the CGIAR Research Program on Dryland Systems, recently conducted studies in pre-conflict Syria and Tajikistan, respectively, probing the realities of this so-called feminization of agriculture. In particular, they investigated the emergence of female labor groups in both countries. Their studies contain recommendations on how government policies could more effectively help these women.

THE EMERGENCE OF FEMALE AGRICULTURAL LABOR GROUPS

Between 1980 and 2010, the proportion of women in Syria's agricultural workforce increased from 32% to 61%. A similar, though less marked, trend has been seen across the Middle East and North Africa generally. Traditionally, women in rural Syria worked as unpaid labor on family farms. Agricultural mechanization and the expansion of construction and industry in the region have caused large numbers of men to leave the agricultural sector, yet many farmers still rely on waged labor for tasks such as weeding and harvesting.

In Tajikistan and Central Asia, this shift is the result of high levels of male outmigration – a response to unemployment and the generally low remuneration from agriculture in the post-Soviet transition era. Women have filled the void left by migrating men. Informal groups of female laborers, many of them managed by female contractors, have come forward to meet the demand in both countries.

In northwest Syria, ICARDA researchers compared female workers' wages and conditions with men's, and assessed the extent to which paid farm work has helped women to become more empowered in their day-to-day lives. In Sughd Province,

Tajikistan, IWMI researchers analyzed the types and characteristics of female laborers' roles in agriculture, their earnings, and the potential for meeting household needs.

A COMPLEX PICTURE OF BENEFITS AND THREATS

ICARDA researchers found that most workers in northwest Syrian labor groups were women, even though female seclusion is a cultural ideal in this society. Their wages were lower than men's, and even if wives earned more than their husbands, men were still regarded as the main breadwinners. Generally, women workers were confined to unskilled

tasks, they remained responsible for childcare and domestic work, and they faced health and safety risks – for instance, due to a lack of protective clothing. However, women told researchers they had a stronger sense of self-worth than before, because their earnings gave them some say over family expenditure. One big advantage of working in groups is that it enables women, who used to have few social interactions outside their own families, the chance to talk to one another. This gives them unprecedented access to information, and a new form of 'social capital' that could help them to negotiate better wages and conditions.

In Tajikistan, researchers found that women's working arrangements, payments, and benefits take several different forms. The most secure type of paid farm work is found on collective farms; such work brings long-term benefits in the shape of land and modest pensions. Yet women working on collective farms do not earn enough to cover their households' basic needs.

The least secure forms of casual labor, on private farms, provide the highest cash earnings. Owing to their substantial income, women undertaking this kind of work are recognized as important contributors to their households. Women also value the flexibility of casual work on private farms, as it enables them to continue looking after their families. Some female labor groups are paid entirely in kind, while others receive a combination of cash and in-kind payments. Payments in kind usually consist of the stems left over after cotton is harvested; they are taken home and used for heating and cooking. Although to outsiders this might seem an unsatisfactory pay bargain, it is acceptable to the women concerned, because the cotton

stems alleviate household fuel poverty.

WHAT CAN GOVERNMENTS DO TO HELP?

The development of female labor groups has enabled women to contribute to their families' income and has brought modest gains in terms of women's empowerment. However, women in the agricultural sector receive low wages, their working conditions are often poor, and their employment is insecure. To some extent there is a trade-off between the flexible nature of such work, which suits women's needs, and generally poor terms and conditions.

IWMI and ICARDA are encouraging governments to come to terms with the new trend of female labor groups and consider their interests during the formulation of agricultural and social protection policies and related projects. In Central Asia, IWMI regularly runs awareness-raising activities and networks with government agencies, donors, and other partners. In Syria, ICARDA has raised the issue with the National Agricultural Policy Center, and shared its research findings with the relevant ministry and agencies.

Researchers point out that the governments should very carefully consider the consequences of embarking on new mechanization drives, as they could deprive women of precious earnings. Similarly, well-meaning attempts to strengthen health and safety

WHAT CAN GOVERNMENTS AND AUTHORITIES DO?

- Recognize and improve their understanding of female labor groups
- Take women's specific needs for flexibility into account in agricultural and related policies, such as those on health, pensions, and safety
- Encourage and support women to organize themselves in labor cooperatives.

regulations might have the unintended effect of restricting casual work opportunities for women. More positively, supporting women to organize themselves in labor cooperatives would bring many benefits, including more secure livelihoods, better workers' rights, and improved access to assets and information.



Female labor groups harvesting vegetables in Tajikistan.

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Cooperatives: can they deliver for rural women?

Rural Women's Cooperatives are increasingly being promoted as an institutional pathway towards empowerment and financial autonomy – despite these organizations facing considerable constraints. ICARDA's experience in Morocco is helping to identify the challenges and strategies needed to strengthen these institutions, so they can deliver on their promise of empowerment.

Marginalized and disempowered, many women farmers across the dry areas of the developing world continue to lack market access and direct involvement in the commercial sphere, limiting their opportunities for income generation. Rural Women's Cooperatives (RWCs) are increasingly being promoted as a vehicle through which women can challenge this inequity: providing them with a stronger voice; facilitating their access to inputs, training, and markets; and increasing their independence.

Unfortunately, institutional weaknesses mean that many of these organizations fail to deliver on their promise of empowerment. Many face capacity constraints and have poorly defined governance structures; they often receive inadequate support from external agencies, and it may be hard to insulate RWCs from pervading social and cultural norms that place limits on female independence.

RWCS IN MOROCCO

Cooperatives are being promoted under Morocco's 'Green Plan', an

ambitious initiative that seeks a shift away from protectionist policies to a more market-oriented agricultural sector. The plan values cooperatives as a means of challenging the poverty and underemployment that pervade the country's marginal areas.

Although the plan does not explicitly mention gender, a strategy focused on RWC development is being pushed by donor agencies. Interestingly, this shift coincides with the emergence of a women's rights movement that has successfully campaigned for raising the minimum age for marriage to 18 and allowing women to divorce with mutual consent. As a consequence, gender has become a priority issue for many development practitioners operating within the kingdom.

CAPACITY CONSTRAINTS

Although the emphasis on RWCs is encouraging, ICARDA's experience suggests that the ability of these organizations to challenge gender inequity remains an open question. An analysis of four value chains in Morocco (argan, rose, cactus, and saffron)

demonstrated that while such cooperatives had undoubtedly delivered gains to women – higher incomes, independence, and self-esteem – these gains were limited.

For instance, many women were earning cash for the first time and directing this new source of income towards food security, health, and education for their families – but in amounts that rarely exceeded the legislated minimum wage.

This shortcoming often resulted from a misguided perception of RWCs as a form of social welfare, not economic institutions with the potential to assist communities and help them achieve self-sustaining sources of income based on production, processing, and marketing.

Donor agencies were criticized for promoting an institutional model that delivered outputs as a time-bound project, rather than a long-term collective initiative, and performance was often held back by weak organizational design and governance structures.

"Our analysis suggested that the underpinnings of cooperative

formation – their objectives, governance structures, and contextual understanding – requires serious and urgent review," argues Dr. Shinan Kassam, a Socio-economist at ICARDA, who has been studying high-value commodity chains in the Souss-Masaa-Draa region of southwestern Morocco.

Furthermore, support provided by extension services was often ineffective. In Morocco, although subsidies were provided for processing equipment and the construction of buildings, there was an inadequate focus on business and management advice. A failure to help RWCs conduct thorough market assessments also resulted in negative outcomes, disillusionment, and membership attrition.

PERVADING SOCIAL AND CULTURAL NORMS

Aside from institutional weaknesses, it remains difficult to insulate cooperative members from pervading societal and cultural norms, which continue to restrict female independence.

Often, women are excluded from directly selling produce in the marketplace. For instance, the marketing of home-processed argan oil has traditionally been undertaken by men, who retain the

income from its sale and disburse this to other household members, thereby reducing women's decision-making power. Despite higher incomes for women, the observance of a significant number of RWCs being managed by males suggests that societal and cultural norms related to marketing still persist.

ICARDA's research has also highlighted the need to understand and address trade-offs: women working long hours outside the home may be empowered, but this additional commitment could come at a cost. "For younger cooperative members, working within a cooperative could mean less time devoted to mothering newborns and pre-school children, thereby passing on child-minding responsibilities to adolescent offspring, who may themselves be disempowered as a result," says Kassam.

IMPROVING PERFORMANCE

Despite these constraints, sensible interventions can help RWCs reach their potential. Their effectiveness, for instance, is likely to depend on the personnel that cooperatives attract. Efforts are therefore needed to identify and encourage good leaders, prioritizing women who combine high self-esteem and solid business acumen.

"Identifying and encouraging positive leadership is key, and can sustain RWCs over the long-term," says Kassam. "But only if this leadership translates into an improved ability for members to expand the range of choices for profitable social and economic engagement through participatory decision-making." While there are positive signs, there is still a need to introduce democratic governance mechanisms into existing RWCs.

Efforts are also needed to address the poor support currently being provided by some local, national, and external agencies – financial and otherwise. In addition to more thorough market assessments and the identification of potential income-generating opportunities in local, national, and international markets, RWCs need to be given a more prominent place in rural development plans.



The processing of argan is a key contributor to household income in the Souss-Masaa-Draa region of southwestern Morocco.

STRENGTHENING THE CAPACITY OF RWCS

- **Shift mindsets:** from viewing RWCs as a form of social welfare to a recognition of their potential as self-sustaining sources of income based on production, processing, and marketing
- **Improve support provided by extension services:** with more emphasis on business and management advice, and more thorough market assessments
- **Identify and encourage effective leaders:** prioritizing women who combine self-esteem and solid business acumen
- Give RWCs a prominent place in **rural development plans**
- **Understand and address the trade-offs** associated with women's contributions to cooperatives.

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Adapting to water shortages in Egypt's New Lands: female farmers show the way

In parts of Egypt's arid New Lands, female farmers are choosing to grow prickly pear, a type of cactus, rather than more conventional crops such as wheat. Prickly pear is better suited to desert conditions than most of the crops promoted in the country. It also generates an income, which helps women to pay for their children's education. Against a backdrop of climate change and associated water shortages, ICARDA researchers have identified ways that the government can support female farmers in the New Lands and promote the cultivation of prickly pear and other drought-tolerant crops throughout desert settlements.

Owing to climate change and population growth in the Nile basin, Egypt is set to face severe shortages of irrigation and drinking water in coming years – it is predicted that by 2050, Egypt will need to use around 50% of the Nile's water for drinking alone. At the same time, up to 15% of agricultural land in the fertile Nile delta could be inundated as sea levels rise.

Since the 1980s, the Egyptian government has been resettling farmers in desert regions – the so-called 'New Lands' – in response to land and water shortages, and as a strategy for boosting food production. Each settler is provided with a plot of land, a

shared irrigation pump, and a house. ICARDA researchers have been investigating how female settlers have adapted to farming in these arid conditions.

PRICKLY PEAR: AN ADAPTATION TO A THORNY PROBLEM

Female farmers in some New Lands settlements grow prickly pear, *Opuntia ficus indica* f. *inermis*, to supply the tourist sector in Cairo and Alexandria. This is partly a response to their marginalization from support programs, such as agricultural extension activities, which promote more conventional cash crops such as wheat.

In fact, prickly pear suits desert conditions better than other produce grown in Egypt, such as fruit trees. The cactus thrives on very little water and does not require frequent labor inputs. Because of these characteristics, it has sometimes been dismissed as a 'lazy farmer's' crop. These same features, however, enable women in the New Lands to combine farming with bringing up their children and running their households, which are often located some distance from their farms. The cash they earn from selling prickly pear fruits has helped them to fund their children's schooling and provide for their daughters' marriages.

BARRIERS TO EXPANDING THE PRODUCTION OF DROUGHT-TOLERANT CROPS

Yet this success story has come about despite, rather than because of, existing policies and programs. Existing programs focus on promoting the cultivation of wheat, fruit trees, and animal fodder in the New Lands, rather than drought-tolerant crops such as prickly pear. A lack of agricultural research on prickly pear has enabled myths about its cultivation – such as the mistaken idea that it should not be intercropped with beans, alfalfa, or wheat – to flourish, limiting its take-up as a cash crop. Other potential uses of prickly pear include fodder for animals and aesthetic products such as oil and cosmetics.

The lack of support for prickly pear cultivation is compounded by inadequate training in desert farming methods generally, especially for female settlers in the more remote New Lands settlements. Poor access to irrigation water is another problem in the New Lands: better-off farmers with land nearer the Nile tend to take more than their fair share of its water, while poor farmers with plots at the end of irrigation canals have to make do with what is left.

FEMALE SETTLERS FACE SPECIFIC PROBLEMS

While there are a few women on village-level water organizations such as water councils, their voices are seldom listened to because of local cultural norms that discriminate against them. In the more remote settlements, many female household-heads have had their electric irrigation pumps and transformers stolen. Others have been issued with diesel pumps, which are expensive to run and produce high carbon emissions. Many women are

WHAT CAN AGRICULTURAL AUTHORITIES DO TO HELP FARMERS IN EGYPT'S NEW LANDS?

They could support poor farmers, both male and female, to adapt to climate change by:

- Delivering information and training on drought-tolerant crops
- Guaranteeing fairer access to irrigation water.

In addition, the government could support female farmers by:

- Improving security in remote desert settlements to reduce theft
- Ensuring that women have a strong voice on water councils and other irrigation bodies
- Providing equipment suited to women's specific needs, such as electric irrigation pumps.



Researcher, Dr. Dina Najjar, with cactus, *Opuntia ficus indica* f. *inermis*, plantation farmer

nervous about using diesel pumps because they fear that their clothes will get caught in the turbines.

IMPROVING SUPPORT TO NEW LANDS FARMERS

ICARDA has identified several ways in which the Egyptian government could support both male and female farmers' efforts to farm successfully in the New Lands against a backdrop of climate change and increasing water stress. Poor farmers need better and fairer access to irrigation water. They also need training and information to encourage them to grow drought-

tolerant crops. The problems specifically facing female farmers need to be addressed, for instance, by improving security in remote settlements and ensuring that their voices are heard on water councils. By successfully growing prickly pear as a cash crop, female farmers have shown a way to adapt to climate change. Now they need the support to back them.

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Enhancing the role of women: dairy production in Jordan

Women are at the center of Jordan's dairy processing sector. Forming the majority of the sector's workforce, they are key contributors to household incomes and rural economies. Ongoing efforts to improve the productivity, hygiene, and profitability of dairy production provide an opportunity to fundamentally improve the livelihoods of women in Jordan's 'Badia'.

Livestock are a mainstay of Jordan's rural communities, particularly in Karak, which is famed nationwide for its cheese, yoghurt, and jameed – a 'rock-cheese' that forms the basis of the country's national dish, mansaf. In this region, some 330,000 sheep produce approximately 8,500 tonnes of milk, which is processed over a four-month period during the spring and early summer. Although dairy processing remains a key contributor to household income, it falls well short of its potential.

Processing units are often poorly equipped and human capacity is low, reflected in the generally inferior nature of many products – despite the area's reputation. There are also issues related to hygiene – production occurs in sub-optimal conditions where mold, yeast, and harmful bacteria can grow, spread, and ultimately undermine quality.

There are also serious health implications for the mostly female workforce who routinely come into contact with raw milk. Typhus and Brucellosis – highly contagious bacterial diseases caused by the ingestion of unpasteurized milk – are present in many sheep flocks and, if contracted, can cause abortions. The lack of hygiene at all stages of production exacerbates the threat.

ADDRESSING THE SITUATION OF WOMEN

In response to the challenges facing dairy producers, ICARDA has been working in Karak to develop and pilot-test technological and institutional options for improving the small-scale processing and marketing of dairy products from sheep and goats, working alongside women's cooperatives and small-scale private processing units. So far, 15 processing units have adopted

cost-effective packages for milk processing.

Initial baseline studies with female producers helped identify constraints and challenges: weak government extension services and limited credit availability reduce access to modern technological inputs; the work is often hard, difficult, and time consuming; and formal market systems do not exist.

"The work is tiring, physically demanding, and time consuming," complains Kafaa Kleesha, a producer from the village of Ader. "I often have to work through the night, and at weekends and holidays during the season." While technological improvements and the fine-tuning of production techniques would help ease the physical demands of dairy processing and reduce the long hours that Kafaa and her fellow producers are forced to work,

support has not always been available.

IMPROVING CAPACITY

Jordan's dairy processing units have another problem: limited capacity, which restricts the amount of milk each unit can process. This means that dairy farmers are forced to incur significant transport costs to sell their milk elsewhere; it also reduces the profitability of processing units – restricting incomes and reducing employment opportunities for local women.

In response, ICARDA is encouraging producers to diversify their strategies, thereby increasing their product range; fine-tuning production techniques to save costs, increase the shelf-life of dairy products, and improve quality; and ensuring that introduced technologies are appropriate and attractive to the target population by incorporating their tastes and preferences.

The introduction of fat separators, for instance, has reduced jameed rancidity and generated extra fat that can be used to make ghee, helping to diversify production. A cost-effective 'Lactoscan' allows processing units to analyze the milk it receives for physical and chemical composition, creating a more transparent relationship between processors and farmers, and helping to progressively eliminate the provision of fraudulent milk.

Quality is further enhanced through thermal treatment. Thermometers are provided so processors can check when the milk exceeds 80°C – the temperature needed to reduce the possibility of contamination and aid concentration – thereby improving the quality of jameed.

The results of these interventions: lower production costs, better

A WIN-WIN STRATEGY TO IMPROVE DAIRY PRODUCTION

Guaranteeing improved quality, lower production costs, and higher incomes:

- **Promoting diversification** – increasing the range of products for higher incomes and stronger resilience
- **Technological innovations** – such as fat separators to reduce workloads and rancidity, and 'milkoscans' to eliminate fraudulent milk
- **Thermal treatment** – improving quality and reducing the possibility of contamination
- **Raising the capacity of processing units** – for higher incomes and more employment opportunities for women.



ICARDA's Dr. Muhi El-Dine Hilali instructs women on proven dairy processing techniques.

quality dairy products, and higher profits, helping to ease the region's high unemployment and poverty. In a typical village where around 16,000 sheep are kept for lamb and milk production, scientists estimate that ICARDA technology packages have the potential to produce 48,000 kg of jameed and 30,000 kg of ghee each year, generating over US\$1 million.

Adoption could also mean stronger resilience in an area already suffering the effects of climate change. Temperatures are rising and rainfall rarely exceeds 300 mm each year – and in some locations it can be as little as 110 mm.

A WIN-WIN SITUATION FOR WOMEN

Women, forming the vast majority of the sector's workforce, have much to gain from the improvements and technologies being promoted by ICARDA. They

can expect higher incomes, reduced working hours, and less physically demanding work – a win-win situation for local women, according to Dr. Muhi El-Dine Hilali, a Dairy Technologist at ICARDA: "Women are at the center of the dairy processing sector in this region – and throughout Jordan. So our attempts to improve the production of dairy products are directly impacting on the livelihoods of women. And we are seeing not only economic benefits – but social benefits too. We can see the social standing of women improve because of the additional contributions they are making to household income."

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Reaching out to Africa's female farmers: Rural Resource Center model



Photo: A. Arinloye, A. Degrande, P. C. Lingani, A. Tapsoba

An innovative participatory extension model being applied across countries in sub-Saharan Africa is proving to be an effective way of reaching out to women farmers, ensuring they receive the support and technologies they need to raise agricultural production.

If you visit the small town of Belo in northwest Cameroon, you may come across a group of gaily painted buildings set in a neat, attractive compound. This is one of six Rural Resource Centers (RRCs) that the World Agroforestry Centre (ICRAF) has pioneered across the country; there are others in Burkina Faso and Mali. RRCs are training and demonstration hubs managed by grassroots organizations. They create opportunities for farmers, including women, to share their farming experiences and to receive technical guidance and services tailored to their livelihood needs. In RRCs, ICRAF has developed a tried-and-tested approach that could revitalize agricultural extension services in Africa and ensure that female farmers, in particular, get the support they need to make their farming more productive.

A FRESH APPROACH

It is well known that women do much of the farming work in rural Africa, but even so they tend to be excluded from government services that provide training and information on new varieties of crops and innovative farming techniques. Agricultural extension services in Africa are usually woefully under-resourced and often fail to address the harsh realities of poor farmers. Also, female farmers tend to be excluded from these services – according to the Food and Agriculture Organization of the United Nations, women benefit from only 5% of agricultural extension activities. One reason for this is that few women work in agricultural advisory services. For instance, in Mali, an estimated 38% of farmers are female, but only 7% of field staff working for

Mali's Agricultural Extension and Advisory Services are women, and all the senior staff and specialists are men.

Using RRCs is a fresh approach that demonstrates improved support to poor farmers, including women. Broadly speaking, the emphasis is on consulting farmers about what they need, then giving them access to the knowledge, information, and inputs they require to improve their productivity. RRCs have been especially successful in promoting agroforestry, a system where farmers grow trees or shrubs in addition to producing conventional crops and rearing livestock.

A typical RRC has a tree nursery, demonstration plots, a training hall, a small library, and offices. All of these are built to a high local standard, clean, and well-

maintained. There may also be accommodation, catering facilities, and an agricultural processing unit. For instance, at the Association pour la Promotion des Actions de Développement Endogènes Rurales Bangangte (APADER), an RRC in west Cameroon, bananas and shea butter are processed into saleable products. APADER has also set up producer groups so that farmers can sell produce such as kola nuts collectively, thus obtaining better prices and reducing their sales costs.

REACHING OUT TO FEMALE FARMERS

RRCs have a good track record of reaching out to female farmers. For instance, women are running experimental plots for RRCs, which inspires other women to try the new methods being demonstrated. This is much more effective than the traditional agricultural extension model of bringing in outsiders, usually men, to provide advice.

"Some trees, such as bush mango, take years to start fruiting. In the Nyaneck RRC, we have been taught grafting and marcotting techniques that bring earlier fruiting. So we are earning more income to pay for our children's school needs and buy household essentials."

Ajeh Celine, Cameroon.



Photo: A. Arinloye, A. Degrande, C. Dembele

Women processing Néré (*Parkia biglobosa*) in Cassou, Burkina-Faso

Dr. Djalal Arinloye and Dr. Ann Degrande, ICRAF's Scientists in the West and Central Africa Region, are particularly proud of the way RRCs have listened to women and responded to their needs, rather than imposing their own priorities. An example of an initiative in Cassou, Burkina Faso is as follows: "The women in Cassou asked the RRC to help them to produce vegetables in their homestead gardens. Wells have been dug so that there is now enough water. Women are using the vegetables for home consumption and to sell in local markets. The upshot is better nutrition – especially for children, young people, and pregnant women – as well as higher income."

Elsewhere in Burkina Faso and in Mali, RRCs have helped female farmers to set up associations for the production and marketing of shea butter. They have also supported the creation of farmers' networks, with the aim of helping more women to sell shea butter on the international market. This requires farmers to upgrade their processing practices so that their shea butter meets the exacting standards of the global cosmetics industry.

REVITALIZING AGRICULTURAL EXTENSION SERVICES: THE RRC WAY

Based on ICRAF's valuable experience in West and Central Africa, staff and partners have identified strategies for re-invigorating agricultural extension services across Africa and ensuring that both male and female farmers get the support they really need.

STRATEGIES FOR RE-INVIGORATING AGRICULTURAL EXTENSION SERVICES

- Integrate the RRC approach into national farmer extension programs
- Encourage partnerships between RRCs and government programs, NGOs, and local authorities
- Train existing female extension officers and recruit new ones from governmental organizations, NGOs, and the private sector
- Use community-based approaches to bring rural advisory services closer to male and female farmers
- Ensure that extension activities address the interests of both female and male farmers.

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Delivering support to women farmers in Afghanistan



In a traditional society like Afghanistan where pervading social and cultural norms place restrictions on the independence of women, providing support to female farmers is never straightforward and resistance can often be significant. Against the odds, ICARDA has adopted an effective outreach model, successfully including women in its capacity-strengthening initiatives. The result: empowerment, higher productivity, and additional household income.

The past couple of decades of war and instability in Afghanistan have devastated its once-thriving agriculture sector. One fallout has been the hardship faced by Afghani women. As men continue to leave home – first to go to war and more recently to seek employment in Kabul and elsewhere – women have been left behind to take care of the household and land.

As a result, women have played an increasing role in Afghanistan's agricultural sector, and are key to the country's ongoing development and reconstruction. But in such a traditional society, where extremely tight limits are placed on women's mobility and freedom, development agencies have struggled to deliver support to Afghanistan's growing number of female farmers.

"The biggest challenge of working with women in traditional societies is how to contact women and encourage them to participate in activities," says Yashpal Saharawat, ICARDA's Afghanistan Country Manager. "Afghanistan is no exception, where pervading cultural and social norms often prevent women from participating in training and workshops, limiting their productivity and potential."

PRACTICAL OUTREACH

Despite the many obstacles, ICARDA's Afghanistan office estimates that it has reached over 10,000 women in recent years. How has the center achieved this, delivering support in remote and conservative parts of the country where resistance can be so high?

Acknowledging realities on the ground, ICARDA staff adopt a practical approach that involves going through male community leaders, discussing an initiative and then explaining how it can generate benefits, for not only women but the whole community. Once convinced, leaders are then encouraged to identify more open-minded farmers who would be willing to involve their wives and daughters in training and workshops.

"Often, the only way to reach women is through male community heads. It's really not possible to reach women directly and this would not be appreciated in Afghani society, particularly in remote areas," argues Saharawat. When resistance is encountered, persuasion is used – ICARDA staff

members explain that women are already active in the field, so why not support efforts to increase their productivity and help them contribute more significantly to household income?

The use of female facilitators is an additional factor in ICARDA's success. Identified for their leadership skills and confidence within rural women's associations, these women can communicate directly with female farmers, lead workshops and training initiatives, and provide role models.

In the case of Frozan Darwish, leadership skills are complemented by persistence. A gender expert at ICARDA, she takes a frontline role to support efforts to reach rural women, travelling to remote rural communities where she is often confronted by the myriad, seemingly intractable problems that Afghani women routinely face. Challenging these problems, she argues, requires "patience, resilience, and a commitment to stand up and change the situation."

Trust has also been important: over the past 13 years, the center has built a solid reputation in Afghanistan, working alongside farmers to raise their production and help rural communities rebuild after decades of conflict. This experience has provided legitimacy, generated confidence in ICARDA's mission, and made communities more receptive to the center's pleas for women's inclusion.

A TOUGH ROAD – BUT BIG RETURNS

Efforts to include women in capacity-strengthening initiatives are beginning to pay off – not least in the Dairy Goat Management project, a flagship initiative of ICARDA to improve the livelihoods of women, which will shortly be coming to an end after a six-year journey.



Adopting a practical approach that acknowledges pervading social realities, ICARDA has successfully included rural women in capacity-strengthening initiatives.

The project combined research and development activities for rural women, providing them with technologies to improve goat and forage production. A major focus was building their capacity on animal health and value addition to milk and dairy products. Special cooperatives were developed to provide eco-friendly infrastructure, while the Ministry of Agriculture supported the value chain by opening a counter within the ministry where women could come and sell their products.

For fodder crop improvement, the project trained graduate women on producing quality seeds. Establishing women-based village seed enterprise allows village women to market improved seed; while women-based fodder banks ensure the availability of fodder during long, harsh winters when a scarcity develops and sometimes animals can die of starvation.

Saharawat summarizes the impacts in a nutshell: "It's the gained economic stability. If we were to ask our women beneficiaries what change are they most happy about, they would probably all say they now have money in their hands to spend and

are able to educate and provide for their children."

A MODEL FOR OTHERS TO FOLLOW

Aware of these successes, other development organizations are studying ICARDA's outreach strategy closely, recognizing its ability to make inroads into traditional communities and convince community leaders that women's involvement in capacity strengthening is a worthy cause.

Action Aid, the Aga Khan Foundation, and Care are all seeking ICARDA's help. Targeted training in the areas of watershed management and crop improvement is now being delivered to the staff of these organizations and could have far-reaching implications – helping to strengthen and broaden the struggle to improve the livelihoods of Afghanistan's women farmers.

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Helping women to help themselves



Photo: ICRISAT/P. Panjiar

Women are taking a lead role in efforts to improve the management of degraded communal pastures in Rajasthan, India. Encouraged to sit on village development councils alongside men, they are challenging gender inequity and making their voices heard in this conservative region. The result: a tighter focus on the needs of female producers, higher productivity, and economic empowerment.

Located in the extreme northwest of India, the state of Rajasthan is a hot, arid region with scant rainfall. Limited opportunities mean that men are often forced to migrate to urban areas in search of work, leaving women and children behind, struggling to survive in a harsh environment characterized by a lack of water and the constant threat of droughts.

In addition, women experience the social costs associated with economic hardship due to family separation, and because of their additional work burden, children are often left on their own unsupervised by adults.

According to Rameshwari Devi, a local woman, survival is a complex and continuous challenge in this tough situation – particularly when

it fails to rain. "I have five goats and seven heads of cattle. If it rains then there will be fodder for the animals – otherwise the animals will die." Forced to buy expensive fodder during dry spells, she has little left to spend on other household needs.

The difficulties faced by Rameshwari and women like her are compounded by gender inequity and a position of marginality, which limits women's capacity to make decisions and change their reality.

EMPOWERING WOMEN

Reversing this marginal status is the aim of a new initiative implemented by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT),

through the CGIAR Research Program on Dryland Systems.

Focusing on water conservation and the regeneration of degraded common pasture lands, efforts were made from the initiative's outset to include women: conducting household surveys disaggregated by gender and involving female farmers in group discussions to understand existing constraints and opportunities.

Disempowerment was further challenged through the placement of women on village development councils. Against the odds, and despite initial resistance, women are now directly contributing to the development of their communities through these bodies.

A STRATEGIC APPROACH

Dryland Systems researchers adopted a strategic and practical approach, using female facilitators who could navigate pervading social and cultural norms, and bypass restrictions that prevented male contact with local women. They also identified individuals within the community who supported their plans and could help influence other people who may have been initially hesitant.

"We did not expect miracles overnight," explains ICRISAT researcher, Dr. Shalander Kumar. "We gave ourselves at least six months to build rapport with the different communities, holding multiple meetings, explaining what we wanted to achieve and the importance of including women in the important decisions facing their communities."

This steady approach eventually paid off: 16 women were elected to the development committees of eight communities. This was a positive development in a region where such involvement was previously non-existent.

Women were also encouraged to initiate their own start-up groups. These bodies were established in three villages, each focused on a specific value chain: pastoral systems, small ruminants, and horticulture. Informal in nature, with internal democratic governing structures, these groups are enhancing the marketing of agricultural products and providing funds to improve women's access to technologies and other inputs.

Outcomes have been extremely encouraging so far: a 10–15% increase in income generated by the sale of goat; greater interest in the management of previously neglected common pastures and a resulting increase in edible biomass; and the establishment of



Photo: ICRISAT/P. Panjari

Indian woman demonstrates a rainwater-harvesting structure erected in her local village.

horticultural gardens. In addition, there has been a noticeable shift in the attitudes of women – from reluctant listeners to active development partners.

PROVEN APPROACHES TO WATER CONSERVATION AND REGENERATION

The approach is a departure from successive past failures to bring changes in target communities – the result of a limited analysis of biophysical factors and a poor understanding of prevalent socio-ecological systems, particularly around common property rights.

The path taken by ICRISAT instead prioritized socio-economics, rules governing the use of common resources, and patterns of interaction among various actors. Women were a primary focus, and their needs and views were fully taken into account when different technological and

institutional options for natural resource management were shared with participating communities.

With women's involvement in village development committees guaranteed, researchers hope that this gender focus will become a defining feature of Dryland Systems' contributions to regional development for moving forward. "Our aim from the beginning was to ensure that women are involved in the decisions that will ultimately impact their livelihoods. Their continued involvement in development committees bodes well for the future," says Dr. Kumar.

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Capacity strengthening with a gender dimension

Incorporating gender into agricultural research for development initiatives is easier said than done. While increasingly recognized as a crucial consideration in drylands studies, researchers may lack gender awareness and experience, and even when research has been 'gendered', struggle to analyze data effectively. ICARDA's experience in Ethiopia, the Middle East, and North Africa reveals important insights to help address these limitations.

While most would agree that a gender focus is important, and necessary, in agricultural research for development, proper implementation may face significant obstacles. Biophysical scientists who have never previously been exposed to gender issues may lack awareness, or struggle to incorporate a gender component into their work.

Consequently, crucial insights into certain aspects of dryland agricultural production systems may be neglected or missed entirely. It is often the case, for instance, that research initiatives fail to understand sufficiently the different roles and responsibilities of men and women. Many may also ignore the issue of gendered relationships and how these govern access to resources and decision-making.

Furthermore, despite the availability of solid social science methods, household surveys, and

participatory research, methodologies are often not 'gendered'; even when research has a gender focus, researchers may struggle to analyze data effectively.

The result: failure not only to address the disempowerment and marginalization of women, but to tackle low productivity and rural poverty in general. Women, after all, are a crucial component of the agricultural workforce and key contributors to household income. Without addressing their needs we cannot begin to address the needs of an entire community.

REVERSING THE GENDER GAP

How do we go about reversing this failure, more effectively incorporating gender into agricultural research for development, and equipping researchers with the knowledge and tools to transform the way they currently approach women's issues?

ICARDA's experience in Ethiopia and across the Middle East and North Africa suggests an approach focused on three main components: capacity strengthening – providing training programs, courses, and ongoing mentoring that expose researchers to relevant concepts and methods; long-term investments in individuals and organizations to develop expertise and strengthen peer exchange and learning; and 'learning by doing' – providing researchers with the time and opportunity to participate in iterative learning and field-based practices. Insights from these experiences provide a framework to guide gender-awareness efforts elsewhere.

Strengthening social and gender analysis in the Middle East and North Africa

Consultations with researchers in the Middle East revealed a widespread failure to effectively integrate social and gender

analyses into agricultural research for development. In response, ICARDA teamed up with Canada's International Development Research Centre (IDRC) to build regional capacity and generate innovative practices and methods that demonstrate the added value of social and gender analysis (SAGA).

The initiative targeted four institutions: Algeria's Institut National de le Recherche Agronomique (INRA); Lebanon's Collective for Research and Training on Development Action (CRTD-A); the Ecole Nationale d'Agriculture (ENA) in Morocco; and the Ecole Nationale Forestiere d'Ingenieurs (ENFI), also in Morocco.

Although a tailored approach was adopted to meet the specific requirements of each institution, a set of common principles was also applied: delivering intensive support to a small number of teams; providing hands-on, practical opportunities for personal development; encouraging self-sufficiency so that researchers do not rely on external support and change can be sustained when support is no longer available; and holding regular regional workshops for interaction, feedback, and discussion.

The impacts were clear, and included: gender dimensions reflected in the proposals developed by the INRA team in Algeria; gender incorporated into

the tools Lebanese researchers use for social engagement with rural communities; increased awareness about the failures of past development efforts to benefit women in Morocco; and the development of gender-sensitive participatory tools, field research guidance, and research questions at ENFI.

ETHIOPIA: BREAKING THE GENDER MOLD

Working alongside scientists from national agricultural research centers in Ethiopia convinced Dr. Bezaiet Dessalegne, a livelihoods specialist at ICARDA, that simply telling researchers to include women in their studies did not work. Taking a different approach, Dr. Dessalegne organized a workshop targeting young, mostly male, researchers from these centers.

Instead of endless slide show presentations, participants engaged in interactive exercises and field studies that encouraged discussion and debate. "We took researchers to a farming community in the region that they knew well. They knew the community members but assumed that what the men said was sufficient for their research," says Dr. Dessalegne.

Three separate focus group discussions were held: one with all male farmers, another with all female farmers, and a third comprising both male and female farmers. They were asked the

same questions and each group responded differently. There were many issues facing the community that the researchers were unaware of, or did not recognize as a priority, despite having worked there for three years.

Women were more vocal in a discussion group composed only of females, and as a result, researchers were encouraged to use various gender-sensitive methods to assess community needs. The result of the initiative: increased awareness of the constraints facing women producers, and a much tighter focus on their needs.

DELIVERING MORE EQUITABLE CHANGE

Efforts to incorporate gender into agricultural research for development are not only a moral response to the disempowerment and marginalization that many women experience across the dry areas; they also make economic sense. Inaction means low productivity and a failure to exploit fully the potential of women's talents and experience.

ICARDA's experiences reveal proven strategies to address this, providing a framework for researchers to reverse the tendency to overlook the needs of women, and a real opportunity to secure more equitable development outcomes.

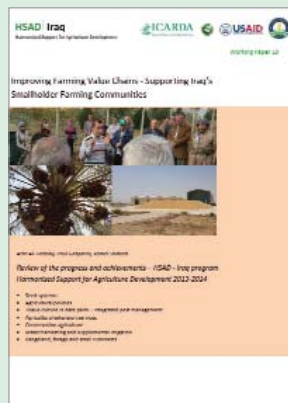
INCORPORATING GENDER INTO RESEARCH FOR DEVELOPMENT

- Tailor capacity strengthening to focus on research team requirements
- Encourage self-sufficiency to sustain improvements over the long term
- Hold regular workshops for interaction, feedback, and discussion
- Encourage interdisciplinary collaboration
- Provide a platform for women to raise their voices.

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Improving Farming Value Chains – Supporting Iraq's Smallholder Farming Communities

A. Al-Haboby, P. Gasparini, K. Shideed.

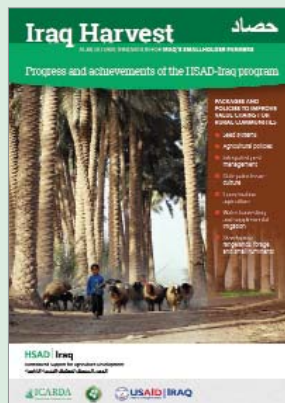
This working paper is a review of the progress and achievements of the Harmonized Support for Agriculture Development (HSAD) Iraq program, 2013–2014.



Strengthening the Capacity of Iraq's Agricultural Sector

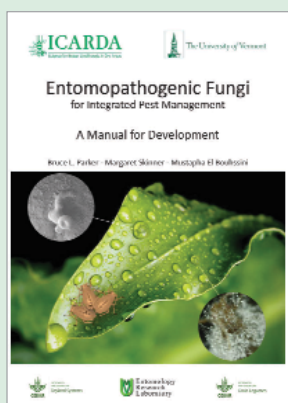
A. Al-Haboby, P. Gasparini.

This working paper is a review of the progress and achievements in Capacity Building of the Harmonized Support for Agriculture Development (HSAD) Iraq program, 2013–2014.



Iraq Harvest: Agricultural Innovation for Iraq's Smallholder Farmers

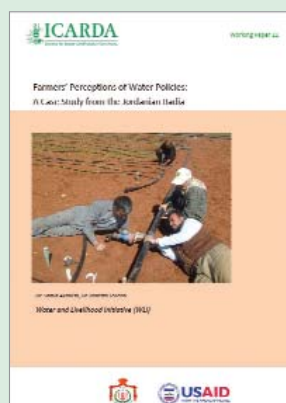
A magazine that summarizes the key activities and achievements of the Harmonized Support for Agriculture Development (HSAD) Iraq program in 2013–2014. It is a compilation of the work of many researchers who have contributed to the substance and achievements of the HSAD partnership.



Entomopathogenic Fungi for Integrated Pest Management: A Manual for Development

B. L. Parker, M. Skinner, M. El Bouhssini.

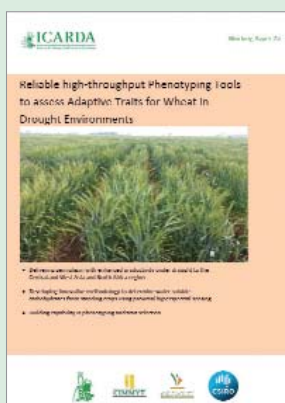
A publication to promote and support the use of insect-killing fungi for pest management. It is also designed to enhance local capacity to conduct research on microbial control and develop appropriate procedures for production of beneficial fungi.



Farmers' Perceptions of Water Policies: A Case Study from the Jordanian Badia

S. Akroush, R. Telleria, Water and Livelihood Initiative (WLI).

This working paper reviews a case study of farmers' perceptions of policies and regulations to improve water security in the Jordanian Badia. The aim is to improve water management and conservation by engaging all stakeholders, in particular farmers and rural communities, in this common goal.



Reliable High-throughput Phenotyping Tools to Assess Adaptive Traits for Wheat in Drought Environments

This working paper documents techniques for: delivering germplasm with enhanced productivity under drought to the Central and West Asia and North Africa region; developing innovative methodology to determine water soluble carbohydrates from standing crops using proximal hyperspectral sensing; and building capability in phenotyping and trait selection.



The International Center for Agricultural Research in the Dry Areas (ICARDA) is the global agricultural research organization working with countries in the world's dry and marginal areas to deliver sustainable systems solutions that increase productivity, improve rural nutrition, and strengthen national food security. ICARDA's integrated approach includes new crop varieties; agronomy; on-farm water productivity; natural resources management; rangeland and small ruminant production; and socioeconomic and policy research to better target poverty issues and accelerate technology adoption. A member of the CGIAR Consortium, ICARDA leads its global research program, Dryland Systems. To achieve its goals, the Center works closely with national agricultural research programs and other partners in more than 50 countries across North and Sub-Saharan Africa, and Central, South and West Asia. www.icarda.org



RESEARCH PROGRAM ON
Dryland Systems

The CGIAR Research Program on Dryland Systems brings together a wide range of partners, including countries, research and development organizations, and private sector to bring rural communities living in the world's dry and marginal areas practical solutions for better livelihoods and food security. The goal of Dryland Systems is to identify and develop resilient, diversified and more productive combinations of crop, livestock, rangeland, aquatic and agroforestry systems that increase productivity, reduce hunger and malnutrition, and improve quality of life among the rural poor. Systems research teams – in partnership with rural communities and countries – are working to validate technology and policy “packages” targeted to agro-ecosystems in drylands, and promote their scaling-out in five flagship regions: West Africa Sahel and the Dry Savannas; East and Southern Africa; North Africa and West Asia; Central Asia and the Caucasus; and South Asia. drylandsystems.cgiar.org



CGIAR is a global research partnership for a food-secure future. CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring sustainable management of natural resources. It is carried out by the 15 Centers that are members of the CGIAR Consortium in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. www.cgiar.org