is functioning in JC Agraharam, Pamidipadu, Dokur and Aurepalle in Andhra Pradesh. Interventions are focused depending upon the needs/background of the specific village under consideration. So in the backward JC Agraharam, studies suggest that PDS, anganwadis, mid-day meal scheme, and dissemination of farm technology have helped. In the more advanced Pamidipadu, VLS have indicated that credit, technical assistance and capital subsidy for alternative income opportunities, such as cold storages and market infrastructure are needed for development. Support for urban-oriented employment, rural non-farm sector employment, migration-related health and social problems are major concerns of Dokur and Aurepalle.

Agribusiness Innovation Platform

The Agri-Science Park@ICRISAT (ASP), renamed as the Agribusiness and Innovation Platform (AIP) was set up in December 2003, with funds provided by the Government of Andhra Pradesh as a part of the Genome Valley Cluster on agriculture. The vision of AIP is to “enhance agricultural development through entrepreneurship, innovation & partnerships.” A Food Safety Laboratory was supported by the Government of Andhra Pradesh and the NutriPlus Knowledge Program (NKP) was established in 2008 with funds from the Andhra Pradesh government. NutriPlus acts as a platform for value-adding to the mandate crops of ICRISAT and also works on food safety. AIP has been actively involved in supporting key events being promoted by the Government of Andhra Pradesh, AIP through its Agri-Business Incubation (AIB) program provides incubation and business development support to several associations and groups.

Knowledge Sharing and Innovation (KSI)

KSI is positioned as a critical focus area at ICRISAT that cuts across all its research programs and transforms research results into data, information, and educational services. Public funded agricultural extension is often inefficient in terms of infrastructure and human resources to meet the needs of smallholder farmers. To meet the challenge of providing smallholders in Andhra Pradesh with the right information at the right time, and also to understand the various

The ICT Rural Hub at Addakal, Mahbubnagar District is a big help for farmers in that region.

dimensions and dynamics of the process, ICRISAT has set up an experimental information and Communication Technology (ICT) Rural Hub in Addakal (one of the poorest and most drought prone regions of Andhra Pradesh located in Mahbubnagar district) to develop and test many information systems linking research, extension and markets. Initial support was received from the Andhra Pradesh Rural Livelihood Project (APRLP). Together with partners, ICRISAT has developed many ICT platforms, which were tested by partnering with a local community-based NGO called the Adairsha Mahila Samakhyta (AMS), which is a federation of village-level micro-credit groups in the Addakal Mandal. The coverage extends to all 37 villages in the Mandal while the federation has a membership of about 8510 individuals (in 569 groups), all women (as of December 2012).

Working in Tandem

Working together with the State government, NGOs, the private sector, and farmers, ICRISAT has been able to help the smallholder farmers of Andhra Pradesh grow better varieties of several crops and thus help them improve their lives and their incomes. ICRISAT is committed to further strengthen its collaboration with the State, especially with regard to the exigencies of climate change, which demand contingency planning for drought and the impacts of delayed monsoon.

About ICRISAT

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), is a non-profit, non-political organization that conducts agricultural research for development in Asia and sub-Saharan Africa with a wide array of partners throughout the world. Covering 6.5 million square kilometers of land in 55 countries, the semi and tropics have over 2 billion people, and 644 million of these are the poorest of the poor. ICRISAT innovations help the dryland poor move from poverty to prosperity by harnessing markets while managing risks – a strategy called Inclusive Market Oriented Development (IMOD).

ICRISAT is headquartered in Patancheru near Hyderabad, Andhra Pradesh, India, with two regional hubs and five country offices in sub-Saharan Africa. It is a member of the CGCAR Consortium.

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One of the biggest success stories in Andhra Pradesh is the chickpea revolution in the State.

Andhra Pradesh and ICRISAT

Making a difference in the lives of farmers in Andhra Pradesh

Introduction

The farmer comes first. This is the motto that has driven the long-standing partnership between the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the Government of Andhra Pradesh (AP) ever since the Institute was established in the State in 1972. The two have very time and again found opportunities to jointly build a future where poverty, hunger and environmental degradation no longer haunt farmers. Moreover, the Institute has always enjoyed the hospitality and steadfast support of the State. Most of ICRISAT-Patancheru’s national staff, and all of the Regular Work Force, hail from Andhra Pradesh.

ICRISAT’s new strategic plan to 2020 follows an inclusive market-oriented development (IMOD) approach to enable the poor to go beyond subsistence farming, paving the way for prosperity in the drylands.

Improved Varieties

To date, a total of 214 high-yielding, disease and/or pest-resistant varieties/hybrids have been released in India. Of these 73 are suitable for Andhra Pradesh, including 25 sorghum (jonna), 24 pearl millet (sajjalu), 9 chickpea (seenge), 7 pigeonpea (kandali) and 8 groundnut (verusengalo). Regional Telugu names in parentheses. Many have been adapted by farmers in AP.

New Hope for Anantapur Groundnut Farmers

Under the aegis of the IFAD TAG 532-ICRISAT project, and in collaboration with the Acharya NG Ranga Agricultural University (ANGRAU) and the NGO Accion Fraterna, ICRISAT launched a farmer participatory varietal selection (FPVS) program in 2002 in Anantapur district. Farmers preferred ICGV 91114 because of its higher pod and haulm yields, early and uniform pod maturity, higher shelling out-turn and larger seed size than variety TMV 2, the previous favorite. It is also tolerant to mid- and end-of-season droughts and also has moderate levels of resistance to foliar diseases.

Economic assessment of the potential benefits of ICGV 91114 in Anantapur district of Andhra Pradesh revealed that mean yield (2004-09) of ICGV 91114 was 23% more than TMV 2. It also provides 36% larger returns per hectare although its cost of production per hectare is 17% higher. In controlled feeding trials of Deccani sheep, ICGV 91114 resulted in higher live weight gain per day. Milk production also increased by 11% when fodder of this variety was used as feed compared to TMV 2. It was released for cultivation in Andhra Pradesh in 2006. Another drought-tolerant, high-yielding ICRISAT variety ICGV 00350 has been released by Regional Agricultural Research Station, Tirupati, AP.
ICRISAT achieved breakthroughs in controlling groundnut pests in AP as follow:  
► A weather-based advisory system for early and late leaf spot diseases and a simple “leaf wetness counter” developed by ICRISAT and partners, which after tests in the farmers’ fields in Anantapur showed that limited fungicide application at the optimal time could provide economic returns, while minimizing environmental hazards;  
► Designing an aflatoxin risk map linking with various soil health parameters (soil calcium, organic carbon, and pH) for Anantapur to better guide farmers to produce high quality groundnut (ongoing);  
► Studies in Anantapur and Chittoor led to a seed pelleting technique with gypsum and chlorpyrifos to manage white grubs.  

Changing Lives with Improved Chickpea and Pigeonpea  
One of the biggest success stories in Andhra Pradesh is the chickpea revolution in the State. There has been a 9-fold increase in production (from 95,000 to 850,000 t) during the past 11 years (1999/00 to 2009/10) because of a 4-fold increase in area (163,000 to 650,000 ha) and a 2.2-fold increase in yield levels (583 to 1308 kg ha⁻¹). About 80% of the chickpea area in AP is cultivated with improved varieties (eg, JG 11, JAK 9218, ICC 37, KAK 2 and Vihar) developed through partnership of ICRISAT and Indian NARS. The chickpea variety JG 11 is presently the most popular variety in Andhra Pradesh grown in about 70% of the chickpea area.  
Pigeonpea is an important pulse crop grown in almost all districts of the state in an area of 500,000 hectares. ICRISAT varieties – Maruthi, Asha, Laxmi and Abhaya – have been under cultivation for more than three decades in the wilt endemic areas of Mahbubnagar, Ranga Reddy, Medak, Nalgonda and Rayalaseema districts where all the local varieties are susceptible to this disease. Every year, through the AP State Seed Development Corporation certified seed of these improved varieties is grown on nearly 200,000 hectares in AP. ICRISAT has developed the world’s first ever pigeonpea hybrids. Hybrid ICPH 2740, which is highly promising for black soil areas of the State, was released in 2012 and is under production in the seed chain of the Department of Agriculture and the AP State Seed Development Corporation and will be commercially cultivated from 2014 by the farmers of Andhra Pradesh.  

Pearl Millet in Action  
Pearl millet is a highly nutritious crop in terms of protein content, amino-acid profile, dietary fiber, and mineral content, especially for the two critical micronutrients Iron and Zinc. ICRISAT research has shown that among all the released cultivars tested so far, an ICRISAT-bred variety ICP 8203 has the highest iron content (63-66 ppm). Its improved version (IC 8203-F) and some of the experimental hybrids recently developed at ICRISAT have even higher iron content. These can be taken to farmers of Andhra Pradesh to help eradicate micronutrient malnutrition and to participate in national efforts in this direction.  

About 110 hybrids of pearl millet are cultivated in India, of which more than 80 are based on ICRISAT-bred parental lines. Andhra Pradesh is the home of pearl millet seed production and is producing more than 80% of the pearl millet seed marketed in India. The highly productive parental lines bred by ICRISAT have sustained this hybrid seed production system and greatly benefitted the farmers of Andhra Pradesh.  

Integreated Pest, Disease and Nutrition Management  
► Pigeonpea and groundnut farmers in southern India, especially in AP, have reduced insecticide use in pilot areas by up to 100% on some fields by using the IPM technology.  
► The practice of controlling the pigeonpea pod borer by manual shaking of plants was revived, fine-tuned and improved by ICRISAT, and spread to 200 villages in four districts by the AP-based NGO Research in Environment, Education and Development Society (REEDS).  

Sharing information on new watershed technologies at a farmers’ day held in Mahbubnagar District.  

ICRISAT in collaboration with scientists from ANGRAU, National Bureau of Plant Genetic Resources (NBPGR), and National Research Centre for Groundnut (NRCG), have developed a strategy to reduce/avoid damage by Peanut Stem Necrosis disease. Early rains precipitate the disease, so precautions such as removing parthenium around the fields, seed treatment and fence cropping are needed.  

Community Watersheds  
Following the success of the consortium model for development of watersheds at Adarsha Watershed, Kothapally, Ranga Reddy district, the AP Government with support from DFID-UK has scaled-up the initiative using the consortium approach. The ICRISAT-led consortium provided technical backstopping to APRLP and established 10 nucleus and 40 satellite watersheds in three districts (Mahbubnagar, Kurnool and Nalgonda districts). Subsequently 50 watersheds were scaled up to 150, covering five districts (Mahbubnagar, Kurnool, Nalgonda, Prakasham and Anantapur) to increase the benefits of the integrated genetic and natural resource management for enhancing the productivity and incomes of the rural poor. This model is scaled-up in India, China, Philippines, Thailand and Vietnam. Subsequently in Andhra Pradesh, this model has been further upgraded through public private partnerships with SAB Miller - India in four villages of Medak district.  
The results from the districts showed that during the scaling-up process, farmers benefitted through increased productivity of different crops (groundnut, maize, sorghum, and cotton) from 70 to 120% over their normal practices. In addition, through the consortium, micro-enterprises such as village-based seed banks, vermicomposting, and nursery raising have also benefited women and the landless farmers in the watersheds. Under the Bhoochetana program, the ICRISAT watershed team has been technically supporting the Department of Agriculture to implement the proposed science-led approach to bridge the crop yield gaps in all districts of Andhra Pradesh by adopting a holistic, consortium systems approach.  
The success of Bhoochetana in AP inspired ICRISAT to scale it up in Karnataka where it helped more than 3 million farmers in the last three years. This has led to increased crop yields within the range of 21-63% for crops such as chickpea, groundnut, sorghum, maize, pigeonpea, finger millet, sweet sorghum, and cotton. In 2011 rainy (kharif) and post-rainy (rabi) seasons, the total area covered under Bhoochetana was 3 million hectares.  

Sorghum for Food, Fodder and Biofuel  
Sorghum continues to be a major food and fodder crop in districts of Adilabad, Nizamabad, Medak, Ranga Reddy, Mahbubnagar and Kurnool districts of Andhra Pradesh. Earlier, ICRISAT and ANGRAU worked together and released cultivars, such as PSV1, PSV16, ASH1 and PSH1 for rainy season adaptation. However, the rainy season area has reduced in AP as there are other competing crops. Sorghum cultivation is increasing in AP, particularly in the ‘Maghi’ belt and in the rice fallow areas of Krishna-Godavari Zone. Sweet sorghum is a SMART crop that gives food, fodder and fuel in a single crop without any significant trade-offs in any of these uses. ICRISAT and the Indian program collaborated on various projects and incubated the sweet sorghum ethanol production technology. The first sweet sorghum hybrid (CSH 22) released for cultivation in India in 2005 was developed by the Directorate of Sorghum Research. The hybrid has the ICRISAT-developed male-stereile line (ICSA 38) as its female parent. ICRISAT-bred improved cultivars, such as ICSV 93046 and ICSV 25280 have higher yielding ability and was recommended for release at the national level.  

Village Level Studies in AP  
Village studies are one of the most efficient ways to understand the farming systems in rural areas and also help in identifying the socio-economic and institutional constraints faced by the farming community. The ICRISAT Economics Program initiated the Village Level Studies (VLS) at six locations in Andhra Pradesh and Maharashtra states in 1975. The major objective of VLS was to understand the socio-economic, agro-biological, and institutional constraints to agricultural development in the semi-arid tropical (SAT) area. Currently the VLS program...