



Africa region, and enhances food security at the household level.

- **The African Market Garden:** In many areas of dry Africa, market gardens are the only form of irrigated agriculture. These gardens, mostly kept by women, generate cash for them, and are sustainable and profitable, because they supply perishable products such as fruits and vegetables that, for obvious reasons, cannot be imported from elsewhere. Swiss Cooperation in Burkina Faso is a key partner in the African Market Garden (AMG) project carried out by ICRISAT. It has sponsored 40 AMG in Ouahigouya area by helping the beneficiary farmers to build reservoirs and providing them extension work and supervision.
- **SADC Seed Security Network (SSN)** – established in 2001 and then integrated as a unit under the Southern Africa Development Community (SADC) has been supporting seed policy harmonization since its inception. The SSN is presently being supported by FAO, SDC, and most recently by USAID.



The ICRISAT DG, Dr WD Dar and Ambassador Remo Gautschi (third from right) with the SDC team members and Team ICRISAT.

Asia Division, SDC and Mr KR Viswanathan, Team Leader, SDC-India. As SDC is one of the major donors to the CGIAR, the purpose of this visit was to acquaint Dr Gautschi with the work carried out at ICRISAT. The ambassador was highly impressed with the progress achieved by ICRISAT in specifically addressing the issues of dryland farmers in India.

In conclusion

The Switzerland-ICRISAT partnership efforts have gone a long way in helping the poor and the marginalized in the semi-arid tropics of Asia and Africa. We look forward to more development in these areas through greater cooperation with Switzerland.

SDC delegation visits ICRISAT

Ambassador Remo Gautschi, former Deputy Director General of SDC visited ICRISAT headquarters at Patancheru, India, in 2007 along with Mr Erwin Banteli, Program Manager, South



The African Market Garden approach uses low-pressure drip irrigation to grow fruit and vegetables that bring in higher incomes and better lives.

Introduction

The need to ensure global food security is a perennial challenge that several countries have focused on over the years. Apart from their regular contributions to this cause, the Government of Switzerland also addresses this challenge through the Swiss Agency for Development and Cooperation (SDC) Global Programme Food Security (GPFS), which puts more muscle into SDC's bilateral and multilateral cooperation efforts. The mission of GPFS is to "influence global food security frameworks, institutions and policies to increase in a sustainable manner the production and productivity of smallholders and to improve the food security of vulnerable populations, particularly women" (SDC GPFS Strategic Framework 2010-2015).

The agricultural development policy of SDC is guided by a vision that closely matches that of

ICRISAT's, namely, fostering food security, gender equity, and preservation of natural resources. The new GPFS strategy focuses on several issues, some of which are particularly meaningful to the work ICRISAT does in Asia and sub-Saharan Africa, and which supports further cooperation and collaboration between the two. Briefly they are as follows:

- GPFS – Strengthen agricultural research for development: Support the development and scaling up of innovative crop improvement technologies that enhance production system productivity
- ICRISAT's research outputs include: Genetically diverse trait-specific populations and breeding lines developed for national agricultural research systems;
- Regionally adapted parental lines, varieties and hybrids developed for Semi-Arid Tropics (SAT) regions;

About ICRISAT

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political organization that does innovative agricultural research and capacity building for sustainable development with a wide array of partners across the globe. ICRISAT's mission is to help empower 600 million poor people to overcome hunger, poverty and a degraded environment in the dry tropics through better agriculture. ICRISAT is supported by the Consultative Group on International Agricultural Research (CGIAR).

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- Effective disease and insect pest management technologies developed along with technologies for improved food, feed and fodder quality and safety
 - Improved varieties developed through the use of conventional and biotechnology tools adopted by farmers
- GPFS – Strengthen agricultural innovation systems: Support global and continental initiatives strengthening agricultural innovation systems and effective advisory service delivery
- African Market Garden: High-value tree crops and drip-irrigated, market-oriented vegetable production by women's groups
 - Intensive Village Level Studies that develop understanding of how smallholder farm households deal with drought and insecurity
- GPFS – Improve resilience to climate change: Affordable genetic resources that are adapted to changing production conditions for use by smallholder farmers
- Conservation of genetic resources in the ICRISAT genebank
 - Increased genomic knowledge and novel alleles/genes transferred into breeding pools
 - Improved cultivars with high yield potential and resistance to major stresses
- GPFS – Natural resources management: Innovative and financially sustainable practices in Integrated Water Resources Management scaled up to contribute to smallholders' food security
- Research at ICRISAT in this area has led to the development of an integrated watershed management system for unlocking the potential of rainfed agriculture; and
 - A community watershed management program put into place for ensuring food security and environmental sustainability.



New watershed management practices, such as intercropping, improve food security.



ICRISAT's peanut varieties make this East Timor farmer happy.

- GPFS – Land degradation: Improved food security for rural populations through effective and sustainable approaches to prevent and reverse desertification and land degradation
- Application of crop simulation models to examine the consequences of different crop management actions for coping with drought and adapting to climate change in drylands
- GPFS – Food security in fragile and post-crisis situations: Smallholders and rural poor gain access to adapted inputs and services in post-crisis situations as well as learn lessons for sustainable management of ecosystems
- An ICRISAT groundnut variety, ICGV 88438 was released in East Timor under the 'Seeds of Life' project after East Timor's agricultural infrastructure was destroyed in the independence struggle.

Along with research for development, ICRISAT sees the need for more effective social assistance programs to help the poorest of the poor connect to markets, but in a way that builds their own resilience rather than creating dependency. ICRISAT's Inclusive Market-Oriented Development (IMOD) strategy focuses on helping the farming poor in the drylands to move from a subsistence to market-oriented agriculture, thus improving their incomes and livelihoods.

Collaboration between ICRISAT and Switzerland

The Swiss Government and ICRISAT have partnered for agricultural progress since 1981. The Swiss government has provided especially strong support to ICRISAT's operations in West Africa. This is most appropriate, since it is home to the



Development of coccinellid predator, *Cheilomenes sexmaculatus* on *Helicoverpa armigera* larvae reared on Bt intoxicated and untreated control artificial diets.

largest number of SAT poor in Africa, and is the major area of cultivation for ICRISAT's focus crops – millet, sorghum, and groundnut. Some of the collaborative efforts are mentioned below.

- ICRISAT is currently working on two projects under the third phase of the Pulse Network of Indo-Swiss Collaboration in Biotechnology (ISCB): *Characterization and evaluation of transgenic events of chickpea containing the DREB1A transcription factor for tolerance to drought stress under contained greenhouse and field conditions*; and *Genetic transformation of chickpeas (*Cicer arietinum* L.) using a chimeric Bt-Cry2Aa gene to confer protection against pod borer (*Helicoverpa armigera*)*. The third phase began in September 2009 for a 3-year period, and is jointly funded by SDC and the Government of India. The work in the first project involves phenotyping of the transgenic events of chickpea that were developed during the second phase for drought stress under contained greenhouse and field conditions. A strip trial for each of the selected events was carried out during the post-rainy season of 2010. A more comprehensive evaluation of this valuable material is currently underway.
- Another project, which also comes under the Pulse Network, is *Compatibility of Bt-transgenic pulses with biological control*. Under this project, Bt-transgenic chickpeas with Bt-Cry2A gene, developed in collaboration with the Assam Agricultural University, India, have been bio-assayed at ICRISAT, and five lines have shown high levels of resistance to the pod borer, *Helicoverpa armigera*. These lines

will be useful for developing chickpea cultivars with high levels of resistance to the pod borer, which is the most devastating pest of this crop worldwide. Under the same network project, ICRISAT has also assessed information on the influence of toxin proteins from the bacterium *Bacillus thuringiensis* and Bt-transgenic crops on target and no-target pests, and the beneficial natural enemies, with particular emphasis on the legume pod borer, *H. armigera*.

- **A capital grant for the construction of the ICRISAT Sahelian Center** Between 1984 and 1986 the Swiss Government assisted ICRISAT with a capital grant of USD 1.5 million towards the construction of ICRISAT's Sahelian Center in Niamey, Niger. This first-class facility is important for research on sustainable agricultural development and the conservation of the tropical desert margins. From 1988 to 1999 the Swiss Government provided **USD 2.5 million for operations** at the Sahelian Center.
- **The CGIAR Systemwide Desert Margins Program** was set up to help arrest the spread of deserts and loss of fertile soil and biodiversity. SDC's contributions in 1995-1996 supported this ambitious project, which aimed to collect and assess current dryland management practices; develop improved soil, water, and biodiversity management strategies and design policies, programs, and institutional options that would serve as incentives to adopt these improved practices.
- ROCAFREMI, the French acronym for **the West and Central African Millet Research Network**, was funded by the then Swiss Development Corporation. The network coordinator was located at ICRISAT-Niamey. This network strengthens and contributed to research on millet with the NARS in the West and Central



Participants of the Pulse Network meeting held in February 2008 at ICRISAT-Patancheru.