ICRISAT Science with a human face

SATrends ICRISAT's monthly e-newsletter

SATrends Issue No. 60

November 2005

1. ICGV 91114 – A winner in Anantapur

Anantapur district lies in the rain shadow area of Andhra Pradesh, India. Despite frequent droughts, over 70% of Anantapur's cultivated area is sown to groundnut. During the last 12 years, there were only four 'good' rain years. The groundnut yield during these years averaged between 800 and 900 kg ha -1 and during 'drought' years between 300 and 400 kg ha -1 . Farmers persist in groundnut cultivation despite the State Government's initiative towards other dryland crops. They know that groundnut can withstand long dry spells much better than other crops and can revive itself even with a little rain after dry spells. Further, it gives valuable fodder even if it fails to produce pods.

Groundnut crop after 30 days of moisture stress

Under the IFAD TAG 532-ICRISAT project, a farmer participatory on-farm varietal selection (FPVS) program was launched in 2002 in collaboration with Rural Development Trust, Agricultural Research Station, Acharya NG Ranga Agricultural University, and active participation of farmers to find a replacement for the traditional groundnut variety TMV 2. Five FVPS trials, each with nine improved groundnut varieties (eight from ICRISAT and one from NARS) and a local control, TMV 2, were conducted in the 2002 rainy season.

Despite severe drought of 45 days just 15 days after sowing, ICRISAT's groundnut variety ICGV 91114 gave higher haulm yield (1460 kg ha -1) compared to TMV 2 (1355 kg ha -1) and at par pod yield (385 kg ha -1) compared with 305 kg ha -1 of TMV 2. This variety was sown again during the 2003 rainy season, and out-yielded TMV 2 with 17 % increase in pod yield and 12 % increase in haulm yield. Also, farmers noticed that the new variety matured earlier than TMV 2 by 7 to10 days, had higher tolerance to drought and foliar diseases, more pods per plant, higher shelling percentage, and larger seeds. After ICGV 91114's good performance in three rainy seasons (2002- 2004) the farmers decided to cultivate this variety in a big way in 2005. This year 452 farmers from 45 villages are growing the variety across 17 mandals in an area of 372 ha.

Akriti Agricultural Associates of India in collaboration with APSSDC and ICRISAT conducted an ICGV 91114 – awareness program in Anantapur this year for more than 800 farmers from 14 villages. Non-participating farmers also visited the demonstration plots and appreciated the merits of ICGV 91114 over TMV 2. AAI along with ICRISAT, RDT and APSSDC are planning a seed multiplication and distribution program for 4,000 ha by the 2006 rainy season for Anantapur.

For more information contact a.rupakula@cgiar.org or s.nigam@cgiar.org

2. Drivers of Agricultural Diversification

High-value commodities (HVCs) such as milk, meat, fruit and vegetables, account for a large share of the total value of agricultural production in a number of regions in India. Based on the share of HVCs, districts have been delineated into low, medium and high diversification zones (Figure 1). On the demand side, factors such as rising incomes, urbanization and change in tastes and preferences drive HVC production. Example: the urban districts group has a higher share of HVCs compared to the far-urban districts group (Figure 2). However, near-urban districts with better road network / connectivity are also diversifying towards HVCs since they are able to meet the demand in the urban centers. Among the HVCs, vegetables and meat products have a higher share in the urban districts group compared to fruits and milk. Fruits have their own production niche, while milk production is more widespread due to the excellent network of cooperatives and related infrastructure. Since urban populations are growing at more than 3% per annum, demand for HVCs will drive their production. Even in rural areas, demand for HVCs will grow as incomes rise.

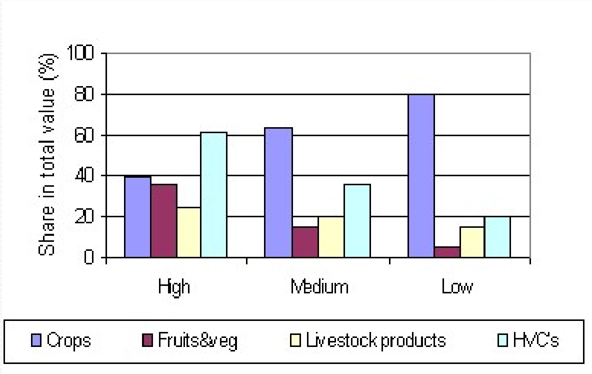

Figure 1. Share of commodity groups by level of diversification: 1998.

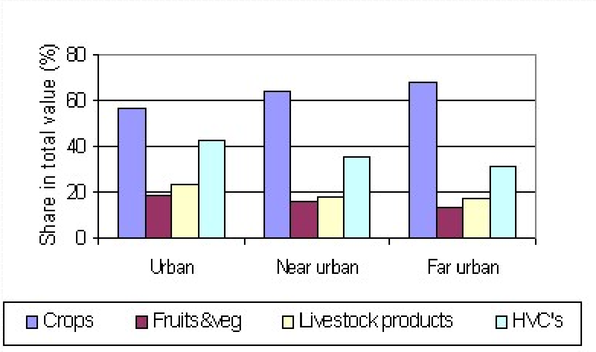

Figure 2. Share of commodity groups and urbanization: 1998.

On the supply side, technology, agro-climatic factors, agrarian structure, and infrastructure facilities significantly influence diversification towards HVCs. For example, rainfed areas significantly influence diversification towards HVCs, while in the regions endowed with good irrigation and high input agriculture, the spread of HVC is low. Among the infrastructure variables road density, market density, and availability of veterinary facilities significantly influence HVC production.

Smallholder farmers would be the major beneficiaries of higher production of HVCs – they could diversify their income sources and augment their employment opportunities. Although, they might lose out in the long-run due to small-scale and scattered production, non-adherence to quality standards, and the perishable nature of the products. Therefore, novel institutional arrangements need to be studied and appropriate policies introduced.

The analysis has highlighted regional variations in the adoption or production of HVCs across the country. Farmers close to cities would stand to gain more from production of HVCs than those farther away. Supply constraints will have to be addressed rapidly to keep pace with demand. Strategies related to infrastructure will have to be matched with the demand drivers and supply side factors. This has implications on public and private sector investment strategies.

For more information contact p.partha@cgiar.org

3. ***Kabuli* chickpea on the upswing**

Traditionally, the cultivation of *Kabuli* chickpea (*Cicer arietinum* L.) was confined to cool areas with long growing seasons. To grow these in tropical environments required that the *Kabuli* chickpea varieties should mature in a short-duration, tolerate high temperatures and resist the devastating disease *Fusarium* wilt. Efforts were made at ICRISAT to develop such varieties through *Desi* x *Kabuli* crosses. The first such variety developed was ICCV 2, which has medium-size seed (25 g 100 seed-1) and matures in 85-90 days in tropical environments. It helped to extend *Kabuli* chickpea adaptation to tropical environments in central and southern India, Myanmar and Sudan. In fact, by 2004, ICCV 2 spread to about 44% of the 208,000 ha chickpea area in Myanmar.

Crop of Kabuli *chickpea in Myanmar*

In recent years, demand for large-seeded (>30 g 100-seed-1) *Kabuli* chickpeas is increasing in the Indian market and also in other parts of the world. ICRISAT, in collaboration with National Agricultural Research Systems in south Asia and sub-Saharan Africa, has developed several short-duration (95 to 110 days), large-seeded (32 to 40 g 100 seed-1), *Fusarium* wilt resistant varieties, eg, KAK 2 (ICCV 92311), JGK 1 (ICCV 92337), Vihar (ICCV 95311) in India; Shasho (ICCV 93512) and Chefe (ICCV 92318) in Ethiopia; and Hawata (ICCV 92318) in Sudan. These new *Kabuli* chickpea varieties are spreading very rapidly. In the southern states of India, *Kabuli* chickpea varieties are replacing commercial crops such as cotton, tobacco and chili.

Demand for extra-large (>55 g 100-seed-1) *Kabuli* chickpea is on the increase in the Indian market. India does not have a variety released with seed larger than 40g 100-seed-1, so the country's demand for extra-large *Kabuli* chickpea is presently being met through import. ICRISAT is working towards combining an extra-large seed trait with earliness and resistance to *Fusarium* wilt. Fifty accessions of *Kabuli* chickpea were selected from ICRISAT's genebank based on seed size and were evaluated for different traits including resistance to *Fusarium* wilt. Two accessions, ICC 14194, ICC 17109, were identified with high levels of resistance. These have been crossed with high yielding short-duration well-adapted varieties KAK 2, JGK 1 and ICCV 2. The crosses are being advanced through fast track (3 generations per year) to make suitable advanced breeding lines available in a short period of 2-3 years.

For more information contact p.gaur@cgiar.org

4. Together we sow, Together we reap

A social impact assessment exercise with women farmers.

Social impact assessments by ICRISAT's Global Theme on Markets, Policy and Impacts present the process of empowerment through technology uptake. Using a case study of ICRISAT's Groundnut Production Technology, the process by which men and women farmers, as well as the whole community, became empowered through the build-up of social capital (referred to as the ability of farmers to develop and use various kinds of social networks and the resources that become available thereof), is systematically documented. The focus is on collective action as a mechanism to stimulate gender-equitable change processes. The study was carried out in two villages – Umra (experimental village) and Ashta (control village) in the state of Maharashtra, India, where the technology had been introduced late 1980's.

Evidence suggests that the technology uptake process was enhanced with the build-up of social capital, whereby the men and women from all class and caste groups came together to improve their livelihoods. Collective action was enhanced with the increased involvement and participation of women. Strong kinship ties were developed among diverse classes including the landless tribal women, which formed the major labor force for this technology. An exploration of the nature/types of networks developed as a result of social capital build-up revealed that t here are substantial differences in networks of men and women, particularly in respect of composition – men belong to more formal networks reflecting their employment/occupation status, while women have more informal networks, which are centered around family and kin. Improvements in household food security, drudgery reduction, and employment opportunities for women have significantly improved with the build-up of social capital and introduction of technology, and their decision-making capacity increased.

It is concluded that social networks played a crucial mediating role in the process of technology uptake. The build-up of social capital played an important role in influencing the distribution of benefits from the technology because of the ways in which social networks and social relationships facilitated technology dissemination. Gender relations played a significant role in mediating the translation of economic benefits into well-being of the individual, the family and community. Finally, it is suggested that further insights into the role of social networks and power relations in the village may be examined in greater detail by establishing the village network architecture especially by including marginalized groups.

For more information contact c.bantilan@cgiar.org or r.padmaja@cgiar.org