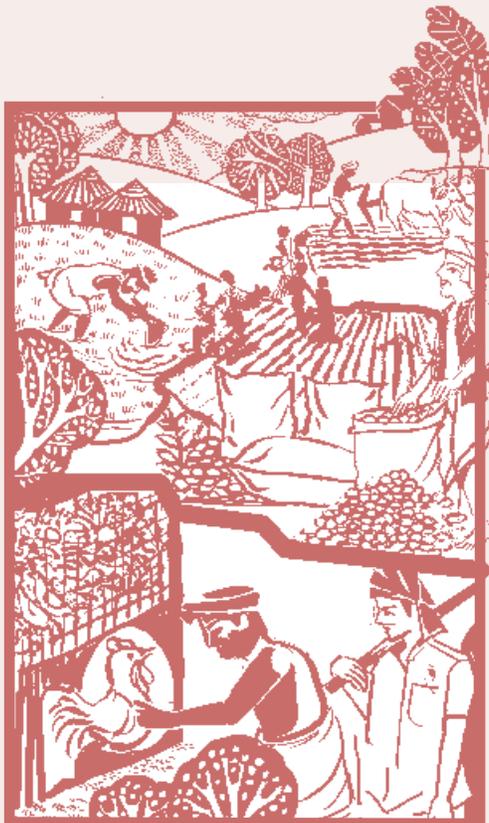


52
2012



Research and discussions centred on the smallholder have rarely attempted to study clusters of small and prosperous farmers (SPFs) who have managed to forge ahead and earn high profits in spite of land constraints. In this Highlight, we study specific case studies of such SPFs in Eastern Gujarat, focusing in particular on smallholders who are integrators in the poultry and processed potato industries, peri-urban vegetable cultivators, and beneficiaries of large scale NGO interventions. We expect SPF clusters to emerge, where farmers have water control, linkages to the market and shift from the production of cereals and millets to high value horticultural crops, meat, milk, fish etc. In our case studies we observe that while water control, proximity and connectivity to markets are necessary, SPF Cluster often emerge where large farmers actively create synergies, invest in backward and forward linkages and demonstrate profitability to small farmers. We also find that thinking about social capital, bonds and networks may be very important when thinking about smallholder prosperity.

IWMI-TATA
Water Policy Program

Water Policy Research

HIGHLIGHT

'From Small Farmers towards Prosperous Farmers'

Four Case Studies from Gujarat

Sneha Lamba

Download this highlight from
www.iwmi.org/iwmi-tata/apm2012

'FROM SMALL FARMERS TOWARDS PROSPEROUS FARMERS' FOUR CASE STUDIES FROM GUJARAT¹

Research highlight based on a paper with same title²

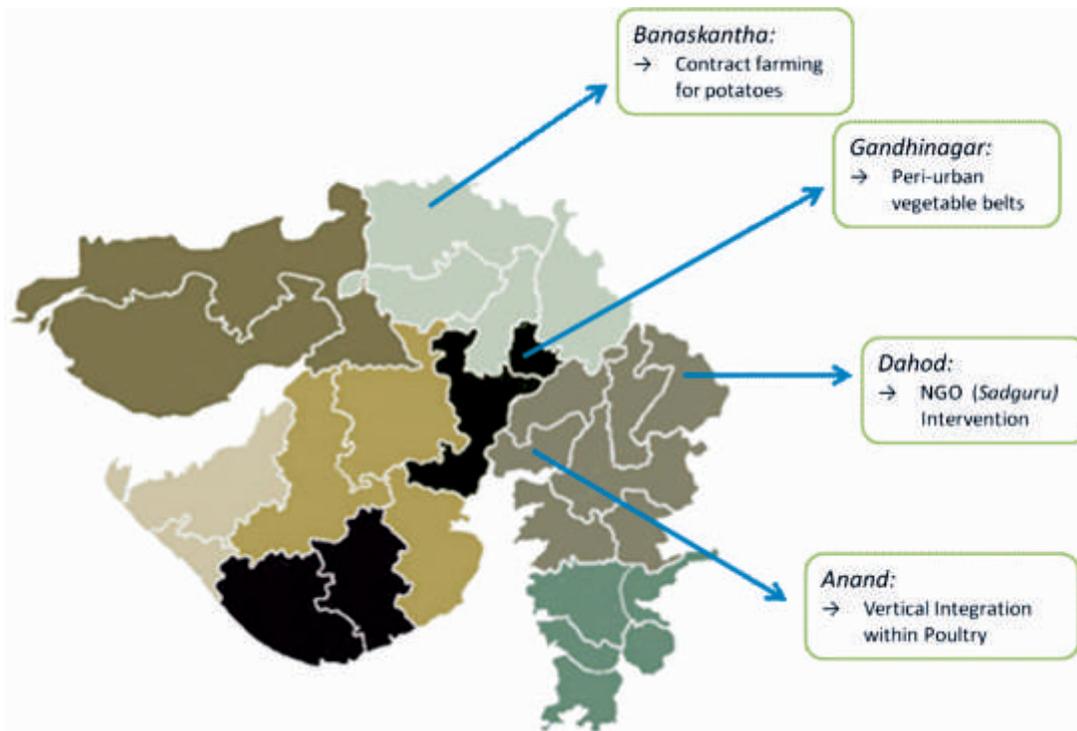
Agriculture in India is characterized by smallholders cultivating small plots of lands that many view to be unviable and unsustainable in the long run. Majority of the discussion with respect to the future of the small farmer have focused on their ability (inability) to cope with changing demand patterns. Much fewer attempts however, have been made to systematically study the small farmer who has succeeded in earning profits using market linkages, technological innovations, NGO interventions etc. This Highlight focuses on studying these often cited but seldom discussed cases of “Small and Prosperous

Farmer (SPF) Clusters”. In particular, we focus on institutions, linkages and channels leading to smallholder prosperity.

CASE STUDY 1: CONTRACTING IN THE POULTRY INDUSTRY – FROM FOOD SECURITY TO SMALLHOLDER PROSPERITY?

Poultry can be an effective means to smallholder prosperity only if the backyard poultry system is transformed so that average flock sizes are increased significantly. Vertical integration offers a viable pathway

Figure 1 Study location for SPF clusters in Gujarat



¹This IWMI-Tata Highlight is based on research carried out under the IWMI-Tata Program (ITP). It is not externally peer-reviewed and the views expressed are of the author/s alone and not of ITP or its funding partners - IWMI, Colombo and Sir Ratan Tata Trust (SRTT), Mumbai.

²This paper is available on request from p.reghu@cgiar.org

Table 1 Describing study locations, methodology and key findings for “SPF Clusters”

Case Study	Location for Study – District	Methodology	Key Characteristics	Smallholder Participation
1. Vertical Integration within poultry	Anand (Villages: <i>Ode</i> and <i>Sarsa</i>)	Semi-structured interviews with SPFs and executives/scientists from Suguna Poultry Products Ltd., Venkateshwara Hatcheries, Simran Farms Ltd.	High value agriculture; connectivity and proximity to Anand city, investments in poultry feed mills and factories around <i>Sarsa</i>	Potentially high; companies prefer scale of operation that is small to medium; Credit may be a constraint; <i>Only</i> subsidies have not propelled participation
2. Contract Farming for Potatoes	Banaskantha (Villages: <i>Ghodial</i> and <i>Iqbalgarh</i>)	Semi-structured interviews with SPFs, executives at <i>McCain</i> Foods Pvt. Ltd.	Large number of players both multinational (<i>McCain</i> , <i>Pepsico</i>) and local (<i>Everest</i> , <i>Balaji</i> , <i>AI</i> , <i>Real</i> etc.), a growing number of cold storages, backward and forward linkages, and growing possibilities of diversification for the smallholder.	Potentially low; synergies between large farmers and companies found to be important for SPF clusters; <i>McCain</i> found to be contracting for small quantities although not necessarily with small farmers
3. Peri-urban vegetable belts	Gandhinagar (Village: <i>Chandrala</i>)	Semi-structured interviews with SPFs	Proximity and connectivity to urban centers (Gandhinagar, Ahmedabad; located on either sides of the National Highway).	Relative; Dependent on the development of entire structures and <i>ecosystems</i> in which large farmers participate, create dynamism and demonstrate profitability, backward, forward and market linkages are established
4. NGO Intervention - Sadguru	Dahod (Villages: <i>Rozem</i> , <i>Kamboi</i> , <i>Degawada</i> , <i>Abhlod</i>)	Semi-structured interviews with NGO beneficiaries who are SPFs	Tribal communities, marginal landholdings, NGO interventions in providing on-demand irrigation, followed by government sponsored schemes in high value agriculture.	High; Intensive cultivation; High degree of diversification; Selling to wholesalers, consumers and in weekly <i>haats</i>

Note: In each of the above case studies there have been no attempt to draw random, stratified or large enough samples of SPFs to generalize results; nor have there been attempts to draw a relevant counterfactual or comparison group. However, a large enough sample has been interviewed to draw inferences about the working of the village economy, agrarian relations, contracting arrangements, and institutional arrangements in irrigation and their impact on smallholder prosperity.

to achieving this. Vertical integration in the poultry industry for broiler units is a classic case of a “production management” contract characterized by farmers contributing labor, farm land, farm infrastructure and equipment, electricity and water, while the processor supplies inputs and extension, advances credit (in kind), provides price insurance and monitors grower effort through frequent inspections. As a result, the broiler contract poultry farmers benefit from: (i) Assurance of a market combined with pre-determined prices (ii) Protection from fluctuations in input prices and the assurance of quality feed and Day Old Chicks (iii) Supervision and Monitoring in a segment of poultry which is largely unorganized as compared to the layer segment.

“SPF clusters” exist within the broiler contract sector³: SPF poultry farmers interviewed combine poultry and horticulture crops, especially the cultivation of bananas. A few of them switched from dairy farming to poultry. Poultry farming offers pathways of earning higher profits per hectare compared to agriculture. However, owing to the large initial investments and long repayment cycles of investments (See Box 1) only wealthy small farmers may be opting for poultry farms. We find that the working capital in poultry ventures is high and it is likely to take several years to recover the initial investment. Indeed, most of the contract poultry farmers that I met were *Patels* (a community recognized for affluence and entrepreneurial skills), although this result maybe a consequence of biased sampling. Therefore, the role of credit needs to be studied carefully because it may be a factor of prime importance⁴. We also need to account for the risk averseness of small farmers.

In my small sample of SPFs, only one had availed and obtained a subsidy (See Box 1), while the others were still to receive the subsidy amount or had not availed the subsidy. *Arvinbhai Parmar* obtained a subsidy of up to Rs.1 lakh on an initial investment of Rs. 3.5 lakhs more than four years ago. Others complain about procedural difficulties being a hindrance. Therefore, we can safely say that *only* the availability of subsidy has in no way propelled farmers in my sample into hybrid poultry farming as a commercial venture.

Assessment of profits that can be obtained: Most small poultry farmers met, earned annual incomes between Rs. 1.2 lakhs - Rs. 2.4 lakhs. Penalties paid for mortality and shortages, as well as movements away from the optimum

Feed Conversion Ratio can eat into incomes earned, therefore the range of incomes earned by farmers I met sometimes differed by quite a bit. The incentives-penalties structures that may differ across companies are built on similar principles are in place to guard against moral hazard and potential losses, but rewards farmers for performance (See Box 1 for details). Such incentive-penalty structures may be crucial to the sustainability of contracting agreements between poultry farmers and the companies, determine risk-sharing and risk-shifting between the company and the farmer and therefore, determine profits earned by the smallholder.

Box 1 Income assessment for a 5000 chick farm

Fixed Costs and Variable Costs

- Initial investment in infrastructure for the 5000 sq. ft. (1 acre = 44,000 sq. ft) poultry farm (Rs. 8 lakh to 9 lakh based on current assessments) with a 25 percent (33 percent for SC-ST and NE region) subsidy on availing a bank loan under the Poultry Venture Capital Fund, 2011.
- Costs related to sprinklers, feeders, drinkers etc.
- Variable costs related to paying for labour, water and electricity and maintenance.

Revenue (Incentives and Penalties)

- Standard growing charges at the rate of Rs.4 per kg amounting to a maximum of Rs. 40,000 every two months (Rs. 2.4 lakhs per annum) given there are no mortalities, shortages and an optimum Feed Conversion Ratio (FCR).
- Most farmers interviewed earned between Rs.30,000 Rs.35,000 every two months, yielding incomes between Rs. 1.8 lakhs and Rs. 2.1 lakhs every year only from their poultry farms.
- Market incentives if retail prices are higher in the open market (at 10 percent of the increase in market price).
- Incentives/penalties for obtaining lower/higher than standard cost of production per kg - 60 percent of each rupee saved on cost of production/30-50 percent on every rupee increment on the cost of production.
- Incentives/penalties for FCRs that are better/worse than the standard.
- Penalties for mortalities or shortages.

³And not in the layer segment of poultry which is largely organized due to the National Egg Coordination Committee, is characterized by economies of scale, and generally large farmers.

⁴Socio-cultural factors may also play an important role. For example, Kshatriya farmers hesitate in taking up poultry as a profession – this was a consideration for the predominantly vegetarian Patels as well, who have changed their perceptions owing to the profitability of the venture.

Scale and distribution of smallholder participation: The nature of broiler poultry contract farming maybe pro-smallholder especially in comparison to contract farming models in potatoes (discussed later) and tomatoes (See Singh 2008). Companies prefer farms ranging between 3000 and 20,000 chicks because larger farms suffer from management inefficiencies and higher mortality. However, the marginal farmer with the resources to build farms with less than 3000 chicks will not benefit from vertical integration. Further, the method of referrals followed by these agribusinesses for new contractors might lead to concentration of beneficiaries among regions, communities or villages.

CASE STUDY 2: CONTRACT FARMING IN THE PROCESSED POTATO INDUSTRY

Another model of contract farming with potato processing companies offers a pathway to prosperity for smallholders. There are two models of vertical integration in operation in *Banaskantha*. The first being *McCain's* model of procuring directly from farmers, and the other being *Pepsico's* model of vendor systems, where each vendor procures from a group of farmers. Farmers in the study area were observed to have switched from Castor and Wheat (in *Rabi*) to processed varieties of potatoes. Shifts are also observed towards higher value horticultural crops such as watermelon. Profits obtained on growing certain processed varieties of potatoes are much higher (between Rs. 35,000 to Rs. 75,000 per acre) than growing wheat in the *rabi* season. *Keshavlaljibhai Patel* from *Ghodial* grows potatoes and groundnut on 2 hectares during *rabi* and *kharif* respectively earning profits greater than Rs. 6 lakhs per annum.

Positive ways in which large farmer-small farmer networks function: In each of the cases, SPFs successfully supplying potatoes to food processing companies were found in villages where linkages with agro-processing industries were already established and other medium and large farmers had participated in developing forward and backward linkages. In *Ghodial*, I find the role of a large farmer was particularly pronounced. *Bhikhaji* first contacted *McCain*, after observing their trial plots in *Banaskantha*, and has since shifted to contracting with *Pepsico*, started growing watermelons, invested in cold storages within the village and influenced several villagers small and big to contract with companies. Similarly, in *Iqbalgarh*, farmers who invest and manage nonfarm businesses that are intrinsically linked to the farm sector as distributors of irrigation systems and vendors for *Pepsico*.

The role played by drip irrigation: Although not specifically mentioned in contracts, drip irrigation and the adoption of technologically superior techniques of cultivation were a prerequisite for entering into contracts with *McCain*. This requirement may have initially been an entry barrier for smallholders as micro irrigation was not subsidized by the government in 2001. This fact combined with the fact that smallholder participation has been brought about due to synergies between large farmers and processor companies, suggests that smallholders may benefit from vertical integration after a certain lag

Scale of smallholder inclusion: As compared to vertical integration within poultry, the scale of smallholder participation may be low for contract farming within the potato processing industry. Businesses often prefer large farmers, due to high transaction costs and risks from purchasing from a large number of small farmers (Vorley et. al. 2008 and Singh 2008). However, *McCain* deals directly with many farmers and 61% (in 2009), 65% (in 2010), 66% (in 2011) of *McCain* contractors⁵ had operational holdings (on which they grew processed varieties of potatoes and not their total land ownership) of less than 6 acres. How can the above two statements be reconciled? For one, the scale of operation for *McCain* is much smaller than other competitors such as *Pepsico* who follow the vendor system to reduce transaction costs. Rough estimates peg *McCain's* scale of operation at 70 tons a day as compared to 1200 tons for *Pepsico*. Secondly, *McCain* officials speak about the direct technology transfer to farmers which could not be achieved through a vendor system. They speak of the possibility of shifting to a hybrid system in future that involves both vendor systems and direct contracts with farmers as their scale of operation increases. Other than the transaction costs, due to which companies prefer to contract with a small number of large farmers, I find that size and quality considerations may exclude small farmers, especially in the event of excess supply in the market.

CASE STUDY 3: A STUDY OF PERI-URBAN VEGETABLES BELTS

Urbanization and rising income levels has evolved into a source of increased incomes for small farmers through peri-urban agriculture which is characterized by intensive rural urban relationships, encouraging the identification of market niches, innovations, and adaption to new demand. In *Chandrala*, the transition from wheat, paddy and cotton to vegetables have led to high profits for smallholders.

⁵From the growers' list provided by McCain Foods Pvt. Ltd.

SPFs in *Chandrala* have an assured regular supply of irrigation water through the collective ownership of tube wells by family members the effective functioning of water markets.

Emergence of peri-urban vegetable belts: SPFs in *Chandrala*, pin the origin of the idea to larger farmers within the village who moved from growing wheat, paddy and cotton to a wide variety of vegetables such as cauliflower, cabbage, egg plant, bitter melon, bitter gourd or bitter squash, green chillies, ladyfinger and more recently tomatoes. Given that risks associated with information asymmetry related to production, markets and prices are reduced significantly through the proximity to urban centres followed by demonstration of profitability by large farmers within the villages, these forces may have reduced the entrepreneurial quotient required to make the transition from growing cereals to horticultural crops for smallholders and altered their assessment of the risks involved in making the transition. Cross-cutting ties or “heterophilous” communication networks (Narayan, 1999 Rodgers, 2003) that allow for greater interactions between small farmers and large farmers are likely to be key to the transition of small peri-urban farmers into SPFs. Further, all the SPFs I spoke to in *Chandrala*, avail crop loans against their landholdings for covering the variable costs (seeds, fertilizers, pesticides, water and labour if purchased) in agriculture. There is a widespread use of modern farming technologies such as trellis systems for growing hybrid tomatoes and several large farmers and SPFs speak about plans for building greenhouses and net houses next. SPFs in *Chandrala* avail the services of soil health experts and water consultants who spoke about how the shift to growing vegetables such as the hybrid tomatoes have led to gains not only for farmers but for them as well. Therefore, *Chandrala* has transformed into an *ecosystem*⁶ where all the forward, backward linkages and adoption of modern technologies have developed in tandem with the cultivation of high value agriculture. SPF *Hirenbhai Patel* earns profits in excess of Rs. 2 lakhs from 4 *bighas* growing cauliflower, ladyfinger and wheat as opposed to less than Rs. 50,000 he earned growing wheat and paddy four years ago, *Prahladbhai Kantibhai Patel* earns Rs.1 lakh per *bigha* growing hybrid tomatoes on 4 *bighas*, Green Chillies on 2 *bighas* and Cabbage on 2 *bighas*. He also combines dairy farming with growing horticulture crops earning profits worth Rs. 7 lakhs per year (from 45 cows).

High initial costs may be a barrier for smallholders: For some particular horticultural crops initial investment costs might be prohibitively high for small farmers. The efficient implementation of government schemes that are often designed around technologically advanced farming (Centrally Sponsored Schemes extended through NABARD and the National Horticulture Board including those for hi-tech horticulture) might bring down initial investment costs to a large extent. For example, the trellis system of cultivating horticultural vegetables which is almost mandatory in the case of hybrid tomatoes and other crops have investment costs that range up to almost Rs. 1 lakh per *bigha*. This is very high if we consider that the initial investment for growing lady finger and cauliflower is only 10 percent of this. These high initial investments combined with the fact that price risks and production risks are much higher in horticultural crops compared to food crops may be potential reasons why small farmers are often *late adopters* and *laggards*⁷ in the cultivation of high value crops.

CASE STUDY 4: NGO INTERVENTIONS BASED ON *SADGURU*⁸

Years of interventions by *Sadguru*, initially ensuring regular supply of irrigation water (through construction of check dams; lift irrigation systems, organizing farmers in Water User Associations), followed by recent interventions in horticulture, floriculture and orchards (Tribal Sub Plan, *Wadi, Bandhu Kalyan Yojana, Trellis Systems etc.* with support from centrally sponsored schemes), display the range of profits that can be earned from marginal landholdings.

In the range of villages visited, cropping patterns among prosperous beneficiary farmers have changed from growing primarily one crop in a year (maize), to growing a combination of maize, paddy, wheat, soya-bean, vegetables and flowers. Most beneficiaries diversify their farm produce significantly. Landholdings among tribal farmers are much smaller than 1 hectare - farmers earn between Rs. 1.5 lakh to Rs. 2.5 lakhs from marginal landholdings. One of the beneficiaries *Amarsinghbhai* earned an income of Rs. 2.4 lakhs from only 1.25 acres growing sponge gourd, bitter gourd, round gourd, different varieties of egg plant, green chillies, fenugreek, coriander, seed nurseries for all these plants as well as selling vermin-compost. *Tribal* communities in this area (mostly *Bhils, Bakshi and Patelia*) would previously migrate to

⁶The author would like to thank Avinash Kishore for the use of this term.

⁷Everett M. Rodgers (2003)

⁸The author would like to specially thank Harnath Jagawath for supporting fieldwork on SPFs and Tanvi Madan for her inputs and field work on SPFs.

urban areas working on public works programs, roads and other infrastructure works, the shift to agriculture as a primary occupation meant that beneficiaries no longer migrate. They now invest in the productive potential of their land. One of notions about tribal people holds that they do not have a sharply defined notion of property rights – I find that a change in this notion may have occurred following *Sadguru's* interventions. This sense of ownership might have brought about greater investment of time and resources in their agricultural assets and land.

Although, reliable source of irrigation water is a crucial component that allows the shift to cultivation of high value varieties of agriculture, smallholders earn high incomes only through horticulture and floriculture, given the size of their landholdings. *Sadguru* interventions, (government schemes implemented by *Sadguru*), allow for better targeting than simple extension of seeds, and input kits by the government because targeting is determined by village employees of the NGO. In some of the village I visited I find that the density of beneficiaries were higher in the community or habitation of the village employee (in charge of beneficiaries at the village level) of *Sadguru*. While, at this exploratory stage we cannot comment on the extent of localization of benefits, this maybe a possibility and requires detailed studies. Even among *Sadguru* beneficiaries who have been exposed to a wide set of interventions, forerunners were found to be earning very high profits (such as the examples of *Kaliben*, *Amarsinghbhai* cited here as well as some others interviewed), although there might be several factors at play including the number of years of intervention in a particular village, as well as the sampling structure which was purposive. A large number of *Bhils* in some of the villages I visited continue to migrate for wages. Interventions such as those by *Sadguru*, have wide implications for beneficiaries, we have much to learn from the sheer scale of intensive cultivation practiced by beneficiaries, the extent of diversification in cropping, intercropping adopted as a practice, vermi-composting to save on costs of purchasing fertilizers, and selling produce in both local markets to wholesalers, end-point consumers as well as in weekly *haats*.

SUMMING UP

What are some of the preliminary conclusions we can draw from these four case studies of SPF Clusters? Based on a synthesis of several other case studies on the same theme, Kishore et. al. (2012) offer some propositions and questions about the transition of small farmers to prosperous farmers. Using their framework as a basis, we try to see if our observations support, contradict or are indifferent to their propositions.

1. Superior water-control is a pre-requisite to prosperity of small farmers

Our case studies suggest that this is largely true, although to varied degrees. Water control is especially important for farmers engaged in horticulture and floriculture. Reliable and on-demand access to water (through private or jointly owned tube wells, lift irrigation schemes or vibrant water markets) was found to be a necessary but not sufficient condition for smallholder prosperity. For farmers in the potato processing industry water control enables the production of potatoes of the required quality while in peri-urban belts and in the areas of *Sadguru's* intervention water control enables farmers to diversify farm produce effectively. For poultry farmers, a regular supply of water is required for drippers (for the chicks) and sprinklers to maintain ideal temperatures.

2. Small farmers have to grow high-value crops to become prosperous

Our case studies focused purposively on farmers who had shifted to high-value crops, meat or milk to earn higher profits. For contractors in the potato-processing industries, farmers in peri-urban vegetable belts and *Sadguru's* areas of intervention we find that the shift to high-value crops has led to prosperity.

3. Specialization vs. diversification of crops and activities as a strategy for small farmers; SPFs prefer crops with multiple harvests to ease liquidity and reduce price risk.

Among the vegetable cultivators in *Sadguru* areas as well as peri-urban vegetable belts, we find that farmers diversify their product portfolio to a large extent; often growing between 3 to 7 vegetables on small parcels, preferring vegetables that allow multiple harvests, or growing a mix of roses (a year round crop) with seasonal flowers. Many SPFs combine poultry and dairy farming with the cultivation of horticultural crops (such as bananas or hybrid tomatoes), as a risk-diversification strategy, as well as to ensure steady income throughout the year. Growing multiple crops and growing crops with multiple harvests are both risk-diversification strategies by farmers. While, the potato producing contractors are found to be specializing in potatoes, they too grow a mix of processed and table varieties of potatoes.

4. Small and marginal farmers face high transaction costs in accessing markets for their produce; Cooperatives are difficult to build and sustain, but production clusters help in overcoming many disadvantages that small and marginal farmers face.

Small farmers are likely to face high transactions costs for accessing markets, except in cases where they are located

close to urban centers (as in the case of peri-urban vegetable belts) or where vertical integration models brings the market to their farm-gates. In the case of SPFs who are potato contracting farmers, we find that synergies created with the company, and investments in forward linkages and backward linkages by the larger farmers reduce transaction costs for small and marginal farmers. In the case of peri-urban vegetable markets, I find that cooperation strategies such as jointly loading trucks and delivery to markets reduce transaction costs for small farmers. Similar cooperative strategies evolve when farmers grow something in clusters or groups, that although not formalized as cooperatives reduce transactions costs for farmers. Therefore, we find that intermediate steps between individual strategies and registered cooperatives which might bring significant gains without the difficulties associated with forming cooperatives.

5. *There has been limited contribution of government in creating success stories.*

Given the exploratory nature of this study, it is difficult to comment on the role of government subsidies and programs on smallholder prosperity. We find that the provision of subsidies alone does not lead to smallholders switching to lucrative opportunities. However, the non-availability of subsidies may act as a barrier for small farmers as we find in the case of potato farmers; and for adoption of modern farming practices such as trellis systems.

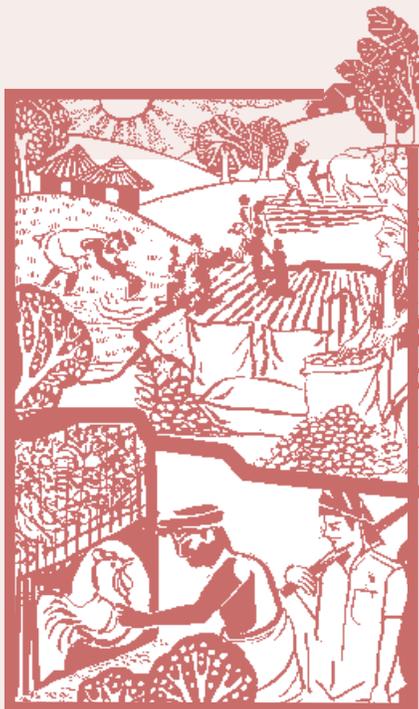
There is no doubt that extension services need to centre stage small farmers in poultry - this has been done to some

extent at least on paper, via a new component providing subsidy to commercial broiler units up to 5000 units that has been introduced into the Poultry Venture Capital Fund in 2011, but the impact of this new component is left to be evaluated. Are there likely to be other approaches that emulate demonstration of profitability by large farmers and alter the small farmers' assessment of risks? For example, the Fish Farmers' Development Agency not only provides training to farmers' but also assists them in establishing and maintaining fish farms and marketing their produce. Fish farms have emerged in *Bharuch* through farmers converting their fields into ponds. Are similar policies suitable for orienting more small farmers into poultry, piggeries etc.?

Processors like *McCain* directly contract with farmers, while those like *Pepsico* include a middleman in the form of a vendor – which of these two models can lead to more SPFs? How can we design models of vertical integration that are more inclusive of the smallholder? One model is the SEWA model, where SEWA acts as an intermediary in supplying *Jeera* and *Castor* to companies such as *Adani*, *ITC* and *Jayant Agro Organics Ltd.* etc. cultivated by beneficiary farmers, and this has led to several pronounced benefits. Do there exist other such models; variations of the SEWA model that have the potential to create more than just income security? Why do processors such as *Suguna*, *Venky*, *McCain* and *Pepsico* target specific regions? Which factors other than agronomical conditions are important for the processor?

REFERENCES

- Kishore, A., Lamba, S., Shah, T., Tewari, N. 2012. How Do Some Small Farmers Become Prosperous? Some Observations And Questions. Unpublished draft, Anand: IWMI-Tata Water Policy Program.
- Narayan, D. 1999. Bonds and Bridges: Social Capital and Poverty. World Bank.
- Rogers, E. M., 2003. Diffusion of innovations (5th edition). New York: Free Press.
- Singh, S. 2008. Marketing channels and their implications for smallholder farmers in India, In: McCullough, E.B., Pingali, P.L. and Stamoulis, K.G.: *The Transformation of Agri-food Systems: Globalization, Supply Chains, and Smallholder Farmers*. FAO, Rome and Earthscan Press, London, 2008, 279-310
- Vorley, L. and MacGregor. 2008. Business Models that are Inclusive of Small Farmers. Paper prepared for FAO and UNIDO as background to the Global Agro-Industries Forum, New Delhi, 8 - 11 April 2008. Accessed on 5th November 2012: <http://pubs.iied.org/pdfs/G02340.pdf>



About the IWMI-Tata Program and Water Policy Highlights

The IWMI-Tata Water Policy Program (ITP) was launched in 2000 as a co-equal partnership between the International Water Management Institute (IWMI), Colombo and Sir Ratan Tata Trust (SRTT), Mumbai. The program presents new perspectives and practical solutions derived from the wealth of research done in India on water resource management. Its objective is to help policy makers at the central, state and local levels address their water challenges – in areas such as sustainable groundwater management, water scarcity, and rural poverty – by translating research findings into practical policy recommendations. Through this program, IWMI collaborates with a range of partners across India to identify, analyze and document relevant water-management approaches and current practices. These practices are assessed and synthesized for maximum policy impact in the series on Water Policy Highlights and IWMI-Tata Comments.

Water Policy Highlights are pre-publication discussion papers developed primarily as the basis for discussion during ITP's Annual Partners' Meet. The research underlying these Highlights was funded with support from IWMI, Colombo and SRTT, Mumbai. However, the Highlights are not externally peer-reviewed and the views expressed are of the author/s alone and not of ITP or either of its funding partners.

IWMI OFFICES

IWMI Headquarters and Regional Office for Asia

127 Sunil Mawatha, Pelawatte
Battaramulla, Sri Lanka
Tel: +94 11 2880000, 2784080
Fax: +94 11 2786854
Email: iwmi@cgjar.org
Website: www.iwmi.org

IWMI Offices

SOUTH ASIA

Hyderabad Office, India
C/o International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
401/5, Patancheru 502324, Andhra Pradesh, India
Tel: +91 40 30713735/36/39
Fax: +91 40 30713074/30713075
Email: p.amerasinghe@cgjar.org

New Delhi Office, India
2nd Floor, CG Block C, NASC Complex
DPS Marg, Pusa, New Delhi 110 012, India
Tel: +91 11 25840811/2, 65976151
Fax: +91 11 25842075
Email: iwmi-delhi@cgjar.org

Lahore Office, Pakistan
12KM Multan Road, Chowk Thokar Niaz Baig
Lahore 53700, Pakistan
Tel: +92 42 35299504-6
Fax: +92 42 35299508
Email: iwmi-pak@cgjar.org

SOUTHEAST ASIA

Southeast Asia Office
C/o National Agriculture and Forestry Research Institute (NAFRI)
Ban Nongviengkham,
Xaythany District,
Vientiane, Lao PDR
Tel: + 856 21 740928/771520/771438/740632-33
Fax: + 856 21 770076
Email: m.mccartney@cgjar.org

CENTRAL ASIA

Central Asia Office
C/o PFU CGIAR/ICARDA-CAC
Apartment No. 123, Building No. 6, Osiyo Street
Tashkent 100000, Uzbekistan
Tel: +998 71 237 04 45
Fax: +998 71 237 03 17
Email: m.iunna@cgjar.org

AFRICA

Regional Office for Africa and West Africa Office
C/o CSIR Campus, Martin Odei Block,
Airport Residential Area
(Opposite Chinese Embassy), Accra, Ghana
Tel: +233 302 784753/4
Fax: +233 302 784752
Email: iwmi-ghana@cgjar.org

East Africa & Nile Basin Office

C/o ILRI-Ethiopia Campus
Bole Sub City, Kebele 12/13
Addis Ababa, Ethiopia
Tel: +251 11 6457222/3 or 6172000
Fax: +251 11 6464645
Email: iwmi-ethiopia@cgjar.org

Southern Africa Office

141 Cresswell Street, Weavind Park
Pretoria, South Africa
Tel: +27 12 845 9100
Fax: +27 86 512 4563
Email: iwmi-southern_africa@cgjar.org

IWMI SATELLITE OFFICES

Kathmandu Office, Nepal
Jhamsikhel 3, Lalitpur, Nepal
Tel: +977-1-5542306/5535252
Fax: +977 1 5535743
Email: l.bharati@cgjar.org

Ouagadougou Office, Burkina Faso
S/c Université de Ouagadougou Foundation
2iE 01 BP 594 Ouagadougou, Burkina Faso
Tel: +226 50 492 800
Email: b.barry@cgjar.org

IWMI-Tata Water Policy Program

c/o INREM Foundation
Near Smruti Apartment, Behind IRMA
Mangalpara, Anand 388001, Gujarat, India
Tel/Fax: +91 2692 263816/817
Email: iwmi-tata@cgjar.org



IWMI is a member of the CGIAR Consortium and leads the:



Research Program on Water, Land and Ecosystems