Indian Journal of Agricultural Sciences **83** (8): 803–8, August 2013/Review Article

Impact of public private partnership in agriculture: A review

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Received: 17 August 2012; Revised accepted: 26 April 2013

ABSTRACT

The importance of Public Private Partnership (PPP) in agriculture is understood in terms of a shared mechanism among partners for input, resource, market, risk, technology and benefits. In addition, review of various studies indicated the visibility of PPP in various facets of knowledge management, capacity building of women and youth, development of high end technologies, processing and market promotion and gender mainstreaming in agriculture. The partnership approach apart from developing certain technologies also empowered farmers in terms of enhanced access to technology and market in India through organized farmers groups. Farm women from difficult areas were enabled to empower themselves through gender mainstreaming techniques. The limitations of PPP such as focus mainly on high end technologies, high profit margin areas and crops, perceived mistrust and lack of transparency and non-adherence to agreement among partners could be overcome through appropriate working mechanism and policy support. Establishing PPP cell at research and development organizations would spearhead the growth of PPP and thereby sustainable agriculture and livelihood of millions of poor farm families in India.

Key words: Gender mainstreaming, Market extension, Public Private Partnership

Production, processing and marketing in agriculture are dynamic in nature due to continuous change in consumer's demand and expectation. An innovative approach is essential to meet the current challenges of agriculture. Currently, Public Private Partnership (PPP) is one of the best experimented strategies to achieve the specified goals within the time frame and modernize public services and infrastructure in agriculture, health, science and technology, education, infrastructure development and extension. The main reason for evolution of PPP in various fields is lack of facilities, human resource and time. Through PPP approach, impossibilities are made possible with the contribution of both public and private partners resulting in better economic conditions and livelihood of target population. In this article various research findings and experiences on PPP are presented to delineate the impact of PPP in agriculture.

CONCEPT OF PUBLIC PRIVATE PARTNERSHIP

PPP involves a contract between public and private sector entities wherein the private entity provides a public service or project and assumes substantial financial, technical and operational risk in the project with specified roles and responsibilities. The PPP approach supplements scarce public resources, creates a more competitive environment and helps to improve efficiencies and reduce costs. The rationale for public sector involvement differs between different kinds of services and influences the type of involvement required (Paul and Margaret 2003). Risk allocation plays a vital role in PPP management. There is a need to delineate an operational mechanism for need based public-private partnerships based on past experiences and derived inferences. Preplanned proposals with time frame, budget, methods and materials would result in expected outcome of PPP, for which it is established.

PPP IN AGRICULTURE SECTOR

Agriculture in the current competitive environment needs more focus to improve the quality and quantity of produce. Global climate change and land and water scarcity are emerging as the major challenges to agricultural sustainability, which need to be addressed through multidisciplinary and multi-institutional efforts with use of cutting edge technologies and forging partnerships across institutions and sectors. Few private institutes are working for the development of agriculture and upliftment of farmers' community. India's expenditure on agricultural R&D and education is currently about 0.6 per cent of the GDP from agriculture and allied activities which needs to be raised at least to 1.0 per cent (Planning Commission 2011).

During the past few years, several partnerships have

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been developed within and between public and private sectors in agriculture which include transfer of technology (genes for desired traits) made available under certain financial terms and conditions, outright donation of technology, knowledge sharing and capacity building. Even basic research projects could be executed in public private partnership mode as exemplified by the Mahyco-DBT partnership on plant genomics. Agriculture Bio-technology Support Programme (ABSP) II model in which Mahyco; Indian Institute of Vegetable Research (IIVR); UAS, Dharwad; and Tamil Nadu Agricultural University, Coimbatore are involved in development of transgenic brinjal varieties resistant to fruit and shoot borer. In this project, ABSP provided the funding, DBT provided the regulatory support, Mahyco provided the cry gene and IIVR has the responsibility to develop the resistant varieties. However, successful partnerships in agricultural biotechnology especially between public and private sectors are still rare because of several constraints, viz. different objectives of each sector, high transaction costs of operationalizing and coordinating the partnerships, mutual mistrust and negative perceptions (APCoAB 2007) as well as uncertainty about actual benefit and outcome from PPP (Krishna and Qaim 2007). Hence, developing partnerships needs policy support and enabling environment to meet the production target set aside for 2020 and 2030. The review indicates that PPP approach in agriculture would be successful if the concerns of partners are taken into account while forging the partnership.

DIMENSIONS OF PPP COVERAGE IN AGRICULTURE

PPP approach is adopted in various facets of agriculture such as research and development, quality enhancement, crop production, extension and marketing. Functional and operational factors of the PPP linkage tend to differ from field to field based on the capability of partners, budget and time frame.

Research

Many of the studies on PPPs focused on agricultural biotechnology, biosafety regulation, intellectual property rights (IPR) and ways in technology transfer in support of pro-poor in developing countries (Spielman *et al* 2007). Several research programmes in India actively sought increased links with private stakeholders as partners and research users (Harris *et al.* 2005) which need variety of institutional innovations and incentives for better coordination of PPP (Byerlee *et al.* 2005) leading to greater ownership of outputs and their effective promotion (Lenne 2008). PPP project in vegetable biotechnology under the aegis of Collaboration on Insect Management for Brassicas in Asia and Africa (CIMBAA) involving ICAR, India; Asian Vegetable Research and Development Center (AVRDC), Taiwan; University of Melbourne, Australia; Natural Resources Institute, University of Greenwich, UK; University of Cornell, USA; and Nunhems, India provided the joint investment and collaborative research in the areas of organic farming, precision farming, production of genetically manipulated varieties with disease and drought resistance which can solve emerging problems like climate change (APCoAB 2007). Since acquiring a EUREPGAP certificate individually is costly in India for the small and medium grape farmers for export marketing, Mahagrapes has managed to provide cooperatives with certification and other support by involving Maharashtra State Agricultural Marketing Board (MSAMB), NRC on grapes, National Cooperative Development Commission (NCDC), APEDA and NHB. Thus, member farmers were facilitated to pay just ₹ 1200 for certification which is much less than the cost of individual membership (Roy and Thorat 2006).

The World Bank funded NAIP project of ICAR established market oriented collaborative alliances comprising public and private partners resulting in 51 value chains covering marigold, cotton, agro-forestry, cobia, neutraceuticals, improvement in *Trichogramma* production etc. (Kochu Babu *et al.* 2011). Vaccines using recombinant technology, Enzyme Linked Immunosorbent Assay (ELISA) testing kits for disease detection, gene silencing, stem cell and gene therapy are some of the frontline areas of biotechnology research and development (APCoAB 2007). PPP for gender mainstreaming in agriculture was implemented with action research mode in six states of India benefiting farm women to access technology and market (Ponnusamy *et al.* 2012). Joint industry and cross-institutional thrust in partnerships could help to maximise the networking possibilities and deliver valuable products for the farmers through a result oriented research in agriculture.

Extension

PPPs cover a wide range of areas including extension services which could enhance technology adoption for sustainable development. Agricultural Technology Management Agency (ATMA) facilitated commodity based groups to partner with private agencies in production and marketing of basmati rice and medicinal plants in Bihar, maize in Andhra Pradesh and mango in Maharashtra (Srinath and Ponnusamy 2011). Syngenta Foundation (www.syngentafoundation.org) in Kenya and Telenor group in Thailand (www.telenor.com) during 2008 took up partnerships approach to help farmers to get weather and market data using mobile phone. The organized groups of farmers at community level can participate in post harvest technologies research with the scientists.

Market and infrastructure development

The Model APMC Act of Government of India encourages direct marketing to enable the farmers get the best price for their produce and create partnerships with

banks, finance and logistics companies for lowest cost financing and marketing. This would attract private investment in creation of much needed marketing infrastructure, create competition and ensure better service to the farmers (Anonymous 2005). In India, ICRISAT's Hybrid Parents Research Consortia brings together 34 small and medium-sized domestic firms for the purpose of commercializing sorghum, millet, and pigeonpea hybrids, thus contributing to the commercial viability of both domestic seed firms and the wider seed market in India. Direct marketing like ITC e-choupal and the National Dairy Development Board model of public-private partnership, provides a viable alternative for small farmers, should be replicated to provide safety net to farmers by financial risk management and introduce effective Agricultural Insurance.

Various literatures brought out the possibilities of PPP approach in research, extension and marketing. Partnering institutions should undertake the need analysis of the technology for application at field level. Coordination between the partners is highly essential to achieve the planned target. Incorporation of copyright component in MoU for a product, technology and information while establishing a PPP for knowledge management is also essential to avoid knowledge and idea thievery. Concurrent monitoring of various stages of research planning and execution will further the quicker development of the technology. Extension reforms with PPP are a recommended approach to reach the unreached. It is difficult to get immediate results as PPP in extension will take considerable time for change in the mind set of the farmers in terms of participation, adoption and acceptance. Partners of PPP in extension should have the rapid and sustainable rapport with the targets continuously until the objective of the study is achieved. Institutions should really come forward to share their knowledge, technology and resources with others voluntarily, since PPP is a win-win approach.

IMPACT OF PPP MODELS IN AGRICULTURE

The good impact of PPP in any field depends on involvement of institutions and industries in seeking collaboration and combining all available public and private skills (Peter 2002). PPP has made positive changes in market linkage of farm produce, capacity building of farm families, reduction of risk and uncertainties, social mobilization and economic empowerment of farmers (Hisrich and Peters 2002).

Knowledge management

Knowledge management strategies in the context of Public-Private Partnerships could result in increased production and better service delivery. PPP approach helped in replacement of traditional rice varieties with basmati rice, cultivation of medicinal and aromatic plants and mushroom in Patna district of Bihar. Farmers obtained an average net income of ₹ 22 000/ha by diversifying from groundnut and paddy to maize in Chittoor district of Andhra Pradesh and also expanded maize area from 60 ha to 1150 ha (Srinath and Ponnusamy 2011).

Development of high end technologies

High end technologies could be developed along with improving efficiency in management of PPPs and improving the institutional intellectual property management skills and information database on available technologies in the public sector. Commercialisation of Bt maize varieties based on partnership between Agricultural Genetic Engineering Institute (AGERI) of Egypt and Pioneer Hi-Bred Company, developing delayed ripening of Papaya between Syngenta and University of Nottingham, development of GM sweet potatoes in Kenya, development of super sorghum through nine globally respected institutions and completion of rice genome sequencing project in 2004 have resulted in high end technologies through PPP approach (Khush 2005).

Reduction of risks and uncertainties

PPP has the potential to reduce risks and uncertainties related to crop failure, pest and diseases, natural calamities and natural resource management. Food safety-related barriers in the export context were addressed through PPP approach for green beans in Kenya and grapes in India. Insurance against drought was made truly affordable in 2009 through PPP between Syngenta East Africa Limited, MEA (a fertilizer company), Kilimo Salama's agribusiness partners and Kilimo Salama's telecommunications partner Safaricom using weather station data resulting in faster payments through phone and reduction in cost of insurance (Narrod *et al*. 2007). John Deere, a leading farm implements manufacturing company helped to promote mechanized farming in tribal region of Gujarat by establishing 8 Agricultural Implements Resource Centers each covering 600 acres of cultivated land through PPP (Reddy and Rao 2011).

Social mobilization

Developmental departments carry out major efforts to activate the group dynamics among the community in order to create a better social linkage through SHG, Farmers' Clubs, Commodity groups, Farmers cooperative societies and Federations. These efforts would be more successful, when they are combined with reputed and capable private partners. Programmes should be inclusive in nature to mainstream poor, women and youth for their active participation in decisions making and benefit sharing. Agricultural Technology Management Agencies (ATMA) created large number of Farmer Interest Groups (FIG) in Nellore, Sangrur, Ratnagiri, Chittor and Patna and they were facilitated to collaborate with private extension players resulting in direct marketing of many farm produce (Srinath and Ponnusamy 2011). The success of social mobilization lies in internalizing the community attributes from the early

stage of the program and considering the grass root institutions to bring desirable social change and development.

University of Agricultural Sciences (UAS), Bangalore facilitated to form Rural Biofuel Growers Association (RBGA) in 2007 which in turn established functional linkages with local developmental agencies in Bangalore rural district for promoting biofuel production, processing and marketing of oil and cake. This project mobilized farmers of 75 villages to contribute to a self sustaining entrepreneurial model (APAARI 2012). A producer group consisting of tribal men and women farmers was formed in 2011 to produce and sell maize through PPP mode in Khurda district of Odisha (Ponnusamy and Kishore 2012). PPP in social mobilization is a grouping factor which is eradicating invisible social discriminations and social immorality prevailed in our Indian society.

Productivity enhancement

The dialogue with Monsanto for transfer of Bt cotton technology to India was initiated by ICAR and Department of Biotechnology, Government of India. Subsequently, Mahyco went into partnership with Monsanto, which finally resulted in the introduction of Bt cotton in India (APCoAB 2007). India experienced an unprecedented increase in Bt cotton acreage from 29000 hectare in 2002 to 9.4 million hectare in 2010 (James 2010). Bt cotton technology has brought in more equality in farm-income distribution (Morse *et al.* 2007). The productivity of cotton has increased from 301 kg/ha in 2002-03 to 526 kg/ha in 2009-10 and reduction in real cost of production ranged from 16 to 46 per cent (Ramasundaram *et al.* 2011).

Economic empowerment of farm women

Public private partnerships for service delivery have revealed significant opportunities for women entrepreneurs and groups in delivering local services and creating conditions for empowerment at the grass root level. The PPP between Cadbury India, Kerala Agricultural University and DBT during past 23 years trained 250 women and established 28 cocoa chocolate units in different parts of Kerala. Thirumadhuram Pineapple project through PPP involving Kudumbhasree Project Mission, Department of Agriculture, women SHGs and Nadukkora Agro-processing centre could produce 25000 tonnes of pineapple in 500 ha and directly employed 12500 women. (Rajendran *et al.* 2010). PPP in vegetable marketing in Coimbatore district of Tamil Nadu, enhanced the income level of farmwomen by 20 per cent (Thangamani *et al* 2012).

Gender mainstreaming in agriculture

Gender sensitized maize production among tribal farm women of Odisha through PPP approach resulted in enhanced knowledge level, productivity and income. Organic farming promoted through PPP mode by Assam Agricultural University enhanced the knowledge and market skills of farm women (Ponnusamy *et al.* 2012). Better market linkage of women vegetable growers with Annapoorna hotel in Coimbatore district of Tamil Nadu resulted in higher income (Thangamani *et.al.* 2012). When the gender as a factor is taken for planning and implementing the agricultural programmes, it is possible to enhance the access of technologies, inputs, credits and markets and result in elimination of gender differences and discriminations in rural area.

Important successful and failure PPP models

The important PPP models concerning success and failure in agriculture in India is given in Table 1.

LIMITATIONS OF PPP MODELS IN AGRICULTURE

The officials at different levels did not act upon to have a better PPP model and money sharing schemes for the benefit of farmers especially for cultivating parental lines of hybrid seed. Private sector seed companies in India tend to concentrate on hybrids where returns are high and assured (Ramasundaram *et. al.* 2011). Resource poor farmers lack capacity to raise their own capital to finance agro-processing infrastructure. The problem is further compounded where the proposed facility depends on a single commodity grown by small-scale farmers carrying high levels of production risk (NAO 2008). PPP in agro-processing suffers due to problems associated with surety of supply of raw materials, mode of procurement and rate fixing and thereby affecting cooperation and coordination between the partners. The performance of private extension is said to vary widely and tends to focus its services on areas with sufficient resources and is limited to a few crops and areas where profits can be assured (Sulaiman and Van Den Ban 2003). PPP approach has few takers for disadvantageous areas and non-commercial crops.

Table 1 Successful and failure PPP models in agriculture

Successful PPP models	Failure PPP models
ATMA initiated PPP models in various states of India (Srinath and Ponnusamy 2011), vermicompost production involving Assam Agricultural University and District Level Rural Development Society (NGO) and farmers groups in Jorhat district (Ponnusamy *et al.* 2012), hybrid rice seed production by IARI and private parties (APCoAB 2007), promotion of mechanized farming in tribal regions of Gujarat and ICRISAT-Private sector sorghum hybrid parents research consortium (Reddy and Rao 2011)	Non-involvement of line departments of local government led to failure of PPP project on 'Bio-ethanol production from sweet sorghum in rainfed areas' and safal terminal market in Bangalore failed due to undue advantage taken by partner (Reddy and Rao 2011)

KEY LESSONS LEARNED FOR LEVERAGING PPP IN AGRICULTURE

The crop specific public-private consortia agreement should be signed for a period of 3-5 years with a definite framework and commitments for work and sharing of resources. Public sector after signing MoU should extend hand holding support. The investment and revenue sharing should be according to the stakeholder's role. PPP needs a common platform to learn the best practices in agriculture at global level. Fortifying PPP through various groups, individuals and organizations could result in enhancing productivity and create new cooperation opportunities as well as meaningful interaction (National Productivity Organization 2011).

There is a need to abolish or reduce fees, cess, taxes, duties etc. on procurement of agricultural or horticultural produce procured through any registered contract-farming programme and develop new structures like pure returns model where both the government and the private participation have equity investment and they work on commercial principles. Limited enforcement of contracts biased against small farmers needs to be tackled through formulation of a model memorandum of understanding to ensure compliance of agreements and maintain market competition. This can boost the bargaining power of small scale farmers and bypass the market intermediaries. The majority of risks in PPP projects, especially those in the meso-level risk group, should be allocated to the private sector (Bing *et al.* 2005). Financial, political, social and economic conditions should be in place to support the PPP and reduce the risks with a minimum and a risk management strategy in correct place (University of Botswana and Commonwealth Secretariat 2011). Resource commitments from all partners, coordination activities to manage and sustain commitment, organizational mechanism to resolve conflicts and bench marks and decision-points that allow partners to evaluate progress and make mid-course correction can further streamline the smooth implementation of PPP in agriculture (Spielman *et al*. 2007).

Successful replication of PPP models across various production hubs for key commodities can change the agriculture from inefficient, supply driven, low value business scenario to an organized, high-tech, demand-led and high-value orientation (Patel *et al.* 2007) and essential to incorporate learnings of previous PPP experiences (Soumitra 2007). PPP would be successful if the government policies provide a level playing field to all the stakeholders (Reddy and Rao 2011). Viability gap funding under the scheme to support PPP in infrastructure to attract private investment should be extended to irrigation, terminal markets, common infrastructure in agriculture markets and capital investment in fertilizer sector.

Lessons drawn from past experiences such as successful PPP require clear identification of roles, responsibilities and reporting, the sharing of resources and expertise to achieve the better results. PPPs must be able to adapt to constantly changing societal needs and expectations as well as politics, global events and personalities; and PPPs face public scrutiny as they often bring together entities with very different missions and mandates. Partners' cooperation and self motivation are essential factors for self sustained PPP linkage. Identification of right partners should be given priority in planning of a PPP model for better agriculture prospects.

Each PPP model is unique and has a well defined understanding among the partners regarding the working relations and outputs. Some of the models could involve a public-public partnership till a certain stage of product development after which a private partner could enter, or vice-versa, depending upon who is providing the innovative farm technology. In each model, there should be clarity on sharing of fund investment, research and development components and business operations. A consortium involving unequal partners may not yield a viable partnership. Further, the models should take into their ambit of the whole chain from innovative product development to marketing. The different operating systems existing within public and private sectors need to be recognized and to create harmonious working relations between the two. Affordability of new technologies and other interests of small farmers need to be kept under consideration while taking up PPP as an empowerment model.

REFERENCES

Anonymous. 2005. Reforms for Raising Farm Income. Agriculture Summit 2005 Jointly Organized by Ministry of Agriculture Govt. of India and Federation of Indian Chambers of Commerce and Industry, New Delhi, pp 11–23.

APAARI. 2012. Biofuel Growers Market Network – A success story, p 30. Asia-Pacific Association of Agricultural Research Institutions, Bangkok, Thailand.

APCoAB. 2007. Brainstorming Session on Models of Public-Private Partnership in Agricultural Biotechnology - Highlights and Recommendations. p 24+viii. Asia-Pacific Consortium on Agricultural Biotechnology, New Delhi and Trust for Advancement of Agricultural Sciences, New Delhi.

Bing L, Akintoye A, Edwards P J and Hardcastle C. 2005. The Allocation of Risk in PPP/PFI Construction Projects in the UK. *International Journal of Project Management* **23** (1): 25.

Byerlee D, Diao X and Jackson C. 2005. Agriculture, rural development and pro-poor growth: country experiences in the post-reform era. Agriculture and rural development. Discussion Paper No. 21, World Bank, Washington DC.

Harris D, Richards J I, Silverside P, Ward A F and Witcombe J R. 2005. Pathways out of poverty. *Aspects of Applied Biology* **75**: 115–26.

Hisrich R D and Peters M P. 2002. *Entrepreneurship*, pp 1–663. Tata McGraw Hill Publishing Company Ltd. New Delhi.

http://www.syngentafoundation.org/index.cfm?pageID=602.

http://www.telenor.com/en/corporate-responsibility/initiatives-worldwide/using-mobile-to-improve-farming-skills.

James Clive. 2010. Global Status of Commercialized Biotech/GM

Crops. 2010. ISAAA Brief No.42. International Service for Acquisition of Agri-biotech Applications, Ithaca, NY.

Khush G S. 2005. Public-Private Partnership in Agricultural Biotechnology. Second Foundation Day Lecture Trust for Advancement of Agricultural Sciences, New Delhi, pp 1–20.

Kochu Babu, Bengali Baboo and Ashutosh Singh. 2011. NAIP Publications, Vol 1, pp 1–142. NAIP, ICAR, New Delhi.

Krishna V V and Qaim M. 2007. Estimating the adoption of Bt eggplant in India: Who benefits from public-private partnership? *Food Policy* **32**: 523–43.

Lenne J M. 2008. Research into Use: Managing achievements for impact. *Outlook on Agriculture* **37** (1): 23–30.

Mathur M P. 2010. Alandur Sewerage Project: A Success Story of Public-Private Partnership Arrangements. Section 10. p 2. Administrative Staff College of India, Hyderabad.

Morse S, Bennett R. and Ismael Y. 2005. Genetically modified insect resistance in cotton: Some earm-level economic impacts in India. *Crop Protection* **24**: 433–40.

NAO. 2008. "Public-private Partnerships and Agroprocessing Facilities", Market-oriented agricultural infrastructure: appraisal of public-private partnerships, agricultural management, marketing and finance. Occasional paper 23, NAO, Rome, p 79 & 103.

Narrod C, Roy D, Okello J, Avendano B and Rich K. 2007. The role of public-private partnerships and collective action in ensuring smallholder participation in high-value fruit and vegetable supply chains. CAPRi Working Paper 70, Washington D C: International Food Policy Research Institute.

National Production Organization. 2011. Concept paper on Productivity Movement in Asia Pacific through International Productivity Congress. Two day Congress on Competitiveness through Productivity, Nov 2011, Islamabad, pp 3–4.

Patel A, Mahendra Sharma and Maurvi Pandya. 2007. Public Private Partnership (PPP) Approach – for Sustainable Development of APMCs in Gujarat. Conference on Global Competition & Competitiveness of Indian Corporate, Gujarat, p 25.

Paul A Grout and Margaret Stevens. 2003. Financing and Managing Public Services: An Assessment. Programme on Public Private Partnership in Social Sector Chapter 6. Bella Vista Publication, Hyderabad.

Peter Scharle. 2002. Public-Private Partnership (PPP) as a Social Game Innovation. The *European Journal of Social Sciences* **15** (3): 227.

Planning Commission, 2011. Faster, sustainable and more inclusive growth-An approach to the twelfth five year plan. Government of India, New Delhi, pp 1–146.

Ponnusamy K, Sabita Mishra, Prusty M and Jiban Dash S S. 2012. Market linkages for women farmers: Public-private partnership shows way ahead. *Indian Farming* **61**(12): 25–8.

Ponnusamy K and Kishore Kundan. 2012. Empowerment of farm women through Public Private Partnership. *Kheti* **64** (12): 28–30.

Rajendran P, Prasad R M and Binoo P Bonny. 2010. Proceedings of National Workshop on Public Private Partnership for Gender Mainstreaming in Agri-entrepreneurship Development. Nov 2011, Kerala Agriculture University, Vellanikara, Kerala, pp 1–113.

Ramasundaram P, Suresh A Kurup and Ramesh Chand. 2011. Maneuvering Technology for Surplus Extraction: The Case of Bt Cotton in India. Policy Brief 37. National Centre for Agricultural Economics and Policy Research, New Delhi.

Reddy G P and Rao K H. 2011. Public Private Partnership in Agriculture-Challenges and Opportunities, Summary proceedings and recommendations of NAARM. National Workshop held on September 19 & 20, 2011. National academy of Agricultural research Management, Hyderabad 500 407, Andhra Pradesh. India.

Roy D. and A. Thorat. 2006. Small they may be, Indian Farmers they are but export they can: The Case of Mahagrapes farmers in India. Washington, D.C.: International Food Policy Research Institute. Mimeo.

Soumitra Sharma. 2007. Exploring best practices in public–private partnership (PPP) in e-Government through select Asian case studies. *International Information & Library Review* **39** (3–4): 203.

Spielman D, Hartwich F and von Grebmer K. 2007. Sharing science, building bridges and enhancing impact: Public-private partnerships in the CGIAR. IFPRI Discussion paper 708. Washington, DC: International Food Policy Research Institute.

Srinath K and Ponnusamy K. 2011. Gender Mainstreaming through Public Private Partnership in Agriculture. Proceedings of the National Workshop on Engendering Agriculture Production and Marketing through PPP, Feb 2011, Avinashilingam University for Women Coimbatore, pp 8–17.

Sulaiman R and A W Van Den Ban. 2003. Funding and Delivering Agricultural Extension. *Indian Journal of International Agricultural and Extension Education* **10**(1): 21–30.

Thangamani K, Leelavathy K C and Meenakshi S. 2012. Mainstreaming of Farmwomen: An Experience of PPP Approach in Vegetable Marketing. Abstracts of Global Conference on Women in Agriculture, 13-15th March 2012, New Delhi, pp 159–60.

University of Botswana and Commonwealth Secretariat. 2011. Implementing Successful and Effective Public Private Partnerships. A Cespam /Commonwealth Secretariat Executive Leadership Seminar, 18–21 January 2011, Gaborone, Botswana, pp 2.