Maximising farm profitability through entrepreneurship development and farmers’ innovations: Feasibility analysis and action interventions

M S NAIN1, RASHMI SINGH2, J R MISHRA3, J P SHARMA4, ANIL KUMAR SINGH5, ANJANI KUMAR6, RESHMA GILLS7 and R S SUMAN8

ICAR-Indian Agricultural Research Institute, New Delhi 110 012, India

Received: 29 September 2018; Accepted: 27 November 2018

ABSTRACT

The focus of capacity building has been shifting from primarily production to agri-business, based on market-led integration and developing other value chains aiming at enhancing farmers’ income. It requires identification and supporting of rural enterprises through technology and skill training, entrepreneurship training, market information, access to institutionalized credit, and other infrastructure related facilities. The need for appreciation of farmers as actors in the innovation system, and institutionalization of farmers’ wisdom for their scalability has been realized at most levels. To develop farming as a business venture and to integrate the farmers’ innovations and opportunities in secondary agriculture an action research study has been conducted in National Capital region of India. Institutional arrangement for facilitation of networking among stakeholders and resources was opined as the foremost requirement for enhancing farm income. The skills in social processes of group management and enterprise management were found lacking among the farmers. The entrepreneurial and technical trainings led to income generating activities. The price spread in major commercial crops showed that the longer chain reduced the producers’ share in consumer rupee drastically which implies the production linkages need to be developed with involvement of all the stakeholders. Through the lessons and opinion of respondents, maximizing farm profitability was found to be interplay of entrepreneurial competencies, entrepreneurial climate, and farmers’ innovations which suggest convergence and synergistic linkages.

Key words: Agripreneurship, Capacity building, Entrepreneurial competencies, Farmers’ innovation, Linkages, Price spread

Agriculture being the engine of economic development of our nation, needs to be supported with efficient secondary agriculture, marketing system, reduction of post-harvest losses, diversification towards high value crops and promotion of agri-entrepreneurship in wake of shrinking resource base and rampant unemployment in rural areas. Also the farmers’ wisdom in the form of their innovations needs to be incorporated during the process of agripreneurship development to attain agricultural growth rate of 4%. There is proven nexus of entrepreneurship and innovation for sustainable development and need of the day is to encourage entrepreneurial agriculture for human development and maximum farm profits. Farm Innovators could effectively become consultants and entrepreneurs leading to off-farm income generation options after getting training and support in certain distinguishing capacities like foreseeing institutional requirements and linkages, comparative financial impact and success analysis ability in addition to analyze projected demand and required changes in socio cultural and infrastructural domain (Nain et al. 2018). On other hand according to social network theory, entrepreneurs’ social ties influence their recognition of entrepreneurial opportunities and entrepreneurial pursuits (Hills et al. 1997). The development of a rural entrepreneurial support system necessitates creating a supportive environment, or social networking, to flourish in an entrepreneurial climate through building partnerships (Dabson et al. 2003). Proper motivation supported by technical backstopping by research institutes, forward and backward linkages for financial needs, learning-by-doing, supported by network collaboration may enhance the competitive potential of new entrepreneurs (Nain et al. 2015). The strength of infrastructure development plays a crucial role in rural entrepreneurship development (FAO 1997). Infrastructure development is highly correlated with the level of entrepreneurial activity across different

2,3Principal Scientist (msnain@gmail.com, rashmi.iari@gmail.com, jyotiranjanmishra@yahoo.co.in), 4Joint Director Extension(jpscatar@gmail.com), ICAR-IARI, 5Principal Scientist (aksingh31@gmail.com), ICAR-IARI Indore; 6Director (anjani.icar@gmail.com), ICAR-ATARI Patna; 7Scientist (reshma1818@gmail.com), ICAR-Central Marine Fisheries Research Institute, Kochi; 8Senior Scientist(rssuman8870@gmail.com), ICAR-IVRI, Izzatnagar.
countries (Zacharakis et al. 1999). Since basic infrastructure development and availability of financing (Kulawczuk 1998) are necessary for any entrepreneurial venture, it is assumed that a country’s rate of the development of the national framework conditions may be a crucial link between a variety of other social, intellectual and environmental dimensions and rural opportunity recognition in a country. There is no proper appreciation of farmers as actors in the innovation system, little information provided about different sources of knowledge involved, or the flow of knowledge and little attention to long-term opportunities on livelihoods (Brigidletty et al. 2012). Fuentes et al. (2013) suggested that private players should assist in the commercialization of farmer-led innovations. Supporting organizations need to facilitate the scaling out process beyond short term research or development projects (Miller and Connell 2010). In order to develop the model of farming a business venture incorporating farmers' innovations, an action research study was conducted in 3 NCR Delhi villages during 2014-18 and the experiences of feasibility analysis and action interventions were documented and presented.

**MATERIALS AND METHODS**

The study was conducted in Faridabad and Palwal districts of Haryana where, 3 villages; Fatehpur Biloch, Manjha wali (Faridabad) and Swamika (Palwal) were selected purposively for action interventions being predominantly engaged in agriculture and having scope of agripreneurship development due to their proximity to National Capital of Delhi. At first stage 135 farmers and farm women (45 from each village) were interviewed and the perceived determinants for maximizing farm income and capacity building needs in agripreneurship development. On the basis of need analysis action interventions were identified and at this stage 110 farmers and farm women were involved on the basis of their interest and motivations. Pre-training and post-training data on entrepreneurial competencies as suggested by McClelland (1969) was collected from 110 farmers and farm women trained on various aspects of entrepreneurship development. In order to understand the backward and forward linkages, 30 farmers each (a total of 120 farmers) cultivating tomato, cauliflower, tuberose and gladiolus were interviewed and the perceived linkages were mapped on 3 point continuum from poor linkage, fair and good linkages with a corresponding score of 1, 2 and 3 respectively. Weighted mean scores for each type of linkages were calculated and on the basis of highest and lowest received mean scores, the linkages were classified as poor (up to 1.7), fair (1.7 to 2.3) and good (above 2.3). The price spread (the difference between the price received by the growers and the price paid by the consumers) for 4 farm products, viz. tuberose, gladiolus, cauliflower and tomato was calculated with standard procedures and the estimate of producer’s share in consumer rupee (₹) was performed with the formula: PS = (PF−PR) × 100, where, PS = Producer’s share in consumer’s rupee, PF = Price received by farmer/producer and PR = Retail price (consumer’s price). To test the scalability of the farmer led innovations, a test was standardized consisting of 7 broad parameters, viz. credibility, complexity, testability, observability of results, relevancy, relative advantage over existing practices and sustainable source of funding with suitable modifications in scaling up toolkit of Cooley and Ved (2012). The data for analysis of scalability of the innovation were collected from 60 farmers (20 from each village) from project locations. Simple statistical tools averages, percentage, mean score, weighted mean score were employed to accomplish the different objectives of the study.

**RESULTS AND DISCUSSION**

**Farmers' perceptions on the requirements to maximize farm income:** An attempt was made to analyze the requirements to maximize the farm income as per the perceptions of the farmers and farm women. Farmers opined that strengthening institutional and individual capacities for scaling up followed by facilitation of networking amongst extension service providers and farmers in the region, mobilizing and allocating resources for scaling up of technological activities and facilitating the sharing of available knowledge on new technologies and innovations were major factors in maximizing farm income (Table 1). In the lower order introduction of innovative production enhancing technologies, development of commodity value chains with farmers’ organisations and emergence of large-scale agribusinesses were also enumerated. As such production technology and value addition practices can help farmers to become independent of the fear of a perishable commodity and not to indulge in distress sale of their produce. This entrepreneurial orientation may help farmer to increase their income and result in prosperity.

| Parameter | Per cent | Rank |
|-----------|----------|------|
| Introduction of production enhancing technologies | 66.7 | V |
| Development of commodity value chains | 41.7 | VI |
| Facilitation of the development and functioning of farmer organisations | 36.7 | VII |
| Facilitation in the emergence of large-scale agribusinesses | 16.7 | IX |
| Mobilization of farmers through farmer-based organisations | 25.0 | VIII |
| Facilitating the sharing of available knowledge on new technologies and innovations | 70.0 | IV |
| Facilitation of networking amongst extension service providers and farmers in the region | 75.0 | II |
| Strengthening institutional and individual capacities for scaling up technologies | 76.7 | I |
| Mobilizing and allocating resources for scaling up of technological activities | 73.3 | III |

A paradigm shift to commercial farm management and agribusiness orientation is needed at present. Also secondary agriculture and its derivatives inter-alia food processing and...
value addition need to be addressed adequately.

**Expressed training needs of farmers and farm women and interventions:*** Training interventions were conducted after assessing training needs of farmers and farm women. Farmers and farm women expressed needs for training in four areas; technical production skills, project launching skills, marketing skills and enterprise management skills (Table 2). Most of them were found to be confident of production and technical skills for taking up value addition enterprises but were found to skeptical of marketing and enterprise management skills. This may be due to the traditional nature of enterprises as they have been taking up value addition of surplus vegetables/fruits at their household level. The social processes of group management skills were also mentioned by farm women for formulating Self Help Groups (SHG) as one significant training need area. In villages Manjhawali and Swamika, farm women were proactive in forming SHGs, whereas more intense efforts of convincing on part of researchers were needed in Fatehpur Biloch for mobilizing farmers/farm women to take up group entrepreneurship.

Based on the needs, two kinds of training modules were designed; on campus and off campus for entrepreneurship development in project villages. One training course was administered at IARI campus in which selected participants from all 3 villages (10 each) were exposed with the technological innovations of IARI based on their prioritized potential agri-enterprises to be taken up as identified earlier through micro-screening exercises with the assumption that these 10 participants from each village will serve as opinion leader and transfer the learnings to fellow farmers and perspective agrientrepreneurs. Afterwards, specific technical training courses (3) and entrepreneurial labs (3) were conducted in all the 3 respective villages with 110 participants. The participation of various stakeholders in each village; non-governmental organisation, government departments (Agriculture, Horticulture), bankers (Syndicate Bank, Corporation Bank, NABARD), established entrepreneurs (in value addition, post-harvest processing of flowers and seed production) and researchers were also elicited. The training courses resulted in not only enhanced motivation, aspirations, entrepreneurial orientation but also creating a facilitative entrepreneurial climate in the form of effective business linkages among various stakeholders.

Based on the needs, two kinds of training modules were designed; on campus and off campus for entrepreneurship development in project villages. One training course was administered at IARI campus in which selected participants from all 3 villages (10 each) were exposed with the technological innovations of IARI based on their prioritized potential agri-enterprises to be taken up as identified earlier through micro-screening exercises with the assumption that these 10 participants from each village will serve as opinion leader and transfer the learnings to fellow farmers and perspective agrientrepreneurs. Afterwards, specific technical training courses (3) and entrepreneurial labs (3) were conducted in all the 3 respective villages with 110 participants. The participation of various stakeholders in each village; non-governmental organisation, government departments (Agriculture, Horticulture), bankers (Syndicate Bank, Corporation Bank, NABARD), established entrepreneurs (in value addition, post-harvest processing of flowers and seed production) and researchers were also elicited. The training courses resulted in not only enhanced motivation, aspirations, entrepreneurial orientation but also creating a facilitative entrepreneurial climate in the form of effective business linkages among various stakeholders.

Table 2 Training Need expressed by respondents in project village (N=90)

| Project village     | Enterprise launching skill | Marketing managing skill | Enterprise management skill | Production technical skill |
|---------------------|----------------------------|--------------------------|----------------------------|---------------------------|
| Manjhawali          | 23 (76.7)                  | 25 (83.33)               | 13 (43.3)                  | 4 (13.1)                  |
|                     | (100.0)                    | (100.0)                  | (100.0)                    | (100.0)                   |
| Swamika             | 30                         | 30                       | 20 (66.7)                  | 15 (50.0)                 |
|                     | (100.0)                    | (100.0)                  | (100.0)                    | (100.0)                   |
| Fatehpur Biloch     | 29 (96.7)                  | 29 (98.7)                | 19 (63.3)                  | 03 (10.0)                 |
|                     | (100.0)                    | (100.0)                  | (100.0)                    | (100.0)                   |
| Total               | 82 (91.1)                  | 84 (93.3)                | 52 (57.7)                  | 22 (24.4)                 |

Figures in parenthesis indicate respective percentages.

Pre and post-training data was collected and it shows that (Fig 1) the levels of thirteen entrepreneurial competencies shifted towards moderate risk taking behaviour and other competencies also shifted towards moderate from lower level. As a result of capacity building interventions 57 farmers/farm women (out of 110 trained) initiated additional income generating activities/agri-enterprises.

**Production linkages of various agri-enterprises:*** Among production and expenditure linkages, production being of direct concern involves backward as well as forward linkages. Backward production linkages are the linkages from farm to the part of the non-farm sector that provides inputs for agricultural production, whereas forward production linkages refer to the part of the non-farm sector that uses agricultural output as an input. The distribution and processing of agricultural outputs are fundamental components of forward production linkages. The type of linkage that exists between the stakeholders decides to a large extent the type of learning and kind of relationship between them. Farmers’ perceptions on their forward and backward linkages were sought on 3 point continuum ranging through poor, fair and good with scores of 1, 2 and 3 respectively. Only fair type of linkages (2.03) was perceived in overall with slight variation in case of flowers and vegetables (Table 3). Linkages with; whole sellers (2.75), peer group (2.70), credit organizations (2.60) and with input suppliers (2.45) was perceived as good whereas the linkages with; secondary processors (1.25), big marketing agencies and exporters (1.35), market researchers (1.40) and cold stores (1.70) was at its lowest ebb with slight variation in vegetables and flowers. In case of vegetables, farmers opined fair type of linkages with cold stores that too for potato and onion only. The linkage with consultancies and advisory service agencies, seed and planting material suppliers and with primary processors was reported as fair. The data shows that the forward and backward linkages for maximizing farm
profitability were not well developed. Nain et al (2015) reported similarly that the partnership, networking, alliance and formal contracts for maximizing farm productivity were missing. Similarly Das et al. (2015) advocated that proper technical backstopping by research institutes, forward and backward linkages for financial needs and learning by doing supported by inter firm network collaboration have the capacity to enhance the competitive potential.

Backward-forward linkages of various agri-enterprises were understood for 2 commercial flower crops, viz. gladiolus and tuberose and two commercial vegetable crops, viz. cauliflower and tomato. Two different marketing channels were identified for gladiolus and tuberose, whereas 3 different marketing channels were found for tomato and cauliflower in the project villages of Faridabad (Fig 2).

There were 3 channels prevalent in marketing of vegetables (Table 4); Channel-I was the direct one without intermediaries, channel-II consisted of one intermediary in the form of retailer and channel-III consisted of two intermediaries, viz. whole seller and retailer. In case of tomato the producer share remained 38.46% in channel-II and only 25% in channel-III, whereas consumer prices increased to the tune of 116.7% and 333.3%, in channel-II and channel-III respectively in comparison to channel-I (direct marketing). The producer (farmer) share in consumer rupee (₹) decreased to 28.57 and 22.85% in channel-II and channel-III respectively. Here it is worth to mention that longer the marketing chain lesser the share of producer in consumer rupee and higher the money spent by consumer to purchase the produce. It indicates that both the producer and consumer are at loss in the longer marketing chains and intermediaries reap the major portion of the benefit. Similar results were reported by Shankar and Singh (2016) where 3 types of channels were found for cauliflower marketing and producer’s share in consumer rupee increased with the reduction of length of the chain. Hence, it implies the dire need for developing agripreneurs in marketing of farm produce and to shorten the length of the marketing chain in order to maximize farm profits. Singh et al. (1994) while studying the production and marketing of hill vegetables in Himachal Pradesh found that the producers’ share of tomato was 43.15% in the consumers’ rupee.

Framework for integrating farmers’ innovations into entrepreneurial development: Relevancy, relative advantage, sustainable source of funding, observability of the results and complexity were ranked as the desired characteristics of farmer led innovations, and had mean weighted score of 6.85, 6.75, 6.47, 6.37 and 6.30 respectively. The perceptions are similar to that of Rogers’ innovation diffusion theory widely used as a theoretical framework for dissemination of technological innovation. Theoretically, the innovations
including clear and replicable technology and self-generating
the financial resources needed for expansion may be best
suited for scaling up. External environment and contextual
factors along with analysis of the institutional requirements
for implementing the innovation also play role in scaling
process and their integration into income generating
activities. In order to scale out and provide impetus to their
institutionalization as an action intervention 5 farm innovators
meet at regional level were organized in which over 60
farm innovators, equal number of extensionists, research
managers, marketing agencies, policy advocates participated
in each. With the experiences of screening the scalability it
was evident that most of the farmers’ innovations were based
on logic of leverage or reconfiguration of existing resources
giving incremental adjustments. The lessons learnt include;
the requirement for establishing and maintaining a database
of available technologies and innovations, establishing
a database including a physical library of all sponsored/
unsponsored reports and publications, establishing and
maintaining a meta-database of agricultural information,
facilitating the database to act as a platform to exchange
information and experiences, developing and disseminating
theme-based knowledge products—posters, radio and
TV messages, pamphlets, etc., publishing lessons learnt
from development and adoption of innovation activities,
undertake an analysis of partner institutions to assess their
potential as participants in maximizing farm profits as
primary information centre and building capacity of partner
institutions (both human and infrastructure) to enable them
become functional primary information centers as well as
active partner. This all require development of institutional
policies and quality assurance protocols.

On the basis of analysis of the successful cases and
the action interventions undertaken a framework for agri-
entrepreneurship and farmers’ innovation dynamics has
been conceptualized. The agri-entreprise development for
maximizing farm profitability was found to be interplay
of entrepreneurial competencies, entrepreneurial climate,
and farmers’ innovations (Fig 3). It was found that the
competencies like opportunity recognition, drive for
excellence, quality concern, moderate risk taking behaviour,
innovativeness and business orientation in presence of
suitable climate like networking, infrastructure, government
priority and financial backstopping lead to experimentation
not only for technological innovation, but also new ways of
managing livelihood in general (networking, communication,
institution building, information management, marketing,
planning, accessing resources, etc.). The innovations which
were economically viable and found sustainable source of
funding were able to translate into entrepreneurial ventures
having higher income and profits. Social networking of
farm innovators has proved to be potential to construct
knowledge. On the other hand to maximize the income,
the farms required certain distinguishing capacities like foreseeing institutional requirements and linkages,
comparative financial impact and success analysis ability in
addition to analyze projected demand and required changes

| Particular             | Channel-I | Channel-II | Channel-III |
|------------------------|-----------|------------|-------------|
| Cost of production     | 203132.5  | 250000.0   | 36434.5     |
| Marketing cost (MC) of producer | 10433.0    | 10000.0    | 15783.0     |
| Gross returns to producer | 250000.0   | 100000.0   | 15783.0     |
| Net return of Producer (MM) (3-(1+2)) | 36434.5     | 31130     | 1132017     |
| MC of wholesaler       | 10000.0   | 100000.0   | 12583.0     |
| Marketing Margin(MM) of wholesaler (7-3+5) | 67417     | 3360000  | 384217.0    |
| Gross price to wholesaler | 280000.0   | 160000.0   | 1760000     |
| MC of retailer         | 2560.0    | 25000.0    | 28000.0     |
| MM of retailer (10-7+8) | 34217    | 650000.0   | 3500000     |
| Consumer price        | 650000.0  | 280000.0   | 2285000.0   |
| Producers share in consumers price (3/10)×100 | 38.46% | 18.26% | 22.85% |
| B:C ratio of producer (3/(1+2)) | 1.45 | 1.40 | 1.16 |

| Particular        | Channel-I | Channel-II | Channel-III |
|-------------------|-----------|------------|-------------|
| Cost of production| 203132.5  | 250000.0   | 36434.5     |
| Marketing cost (MC) of producer | 10433.0    | 10000.0    | 15783.0     |
| Gross returns to producer | 250000.0   | 100000.0   | 15783.0     |
| Net return of Producer (MM) (3-(1+2)) | 36434.5     | 31130     | 1132017     |
| MC of wholesaler   | 10000.0   | 100000.0   | 12583.0     |
| Marketing Margin(MM) of wholesaler (7-3+5) | 67417     | 3360000  | 384217.0    |
| Gross price to wholesaler | 280000.0   | 160000.0   | 1760000     |
| MC of retailer     | 2560.0    | 25000.0    | 28000.0     |
| MM of retailer (10-7+8) | 34217    | 650000.0   | 3500000     |
| Consumer price     | 650000.0  | 280000.0   | 2285000.0   |
| Producers share in consumers price (3/10)×100 | 38.46% | 18.26% | 22.85% |
| B:C ratio of producer (3/(1+2)) | 1.45 | 1.40 | 1.16 |

Table 4 Analysis of price spread in flowers (tuberose and gladiolus) and vegetables (Tomato and cauliflower)
in socio cultural and infrastructural domain. The results are in conformity with Singh et al. (2014, 2016). Whereas, it was inferred that individual motivations and aspirations trigger entrepreneurship and the competencies along with best practices (innovations) and convergence of synergistic linkage play sequential role for enterprise success.

Institutional mechanism and human resources base in rural ecosystem was found lacking in social processes of group and enterprise management skills along with marketing and communication skills. The capacity building interventions not only helped in changing entrepreneurial competencies but broadened the horizon of the participants to adopt secondary agriculture and launch their own income generating activities. The backward and forward linkages in the form of advisory services, input supply, marketing of the produce, financial backstopping was at a fairer level and the support and convergence of various stakeholders like banks, NGOs, research institution, state line department brought positive impact in the form of initiation of income generating activities. The price spread analysis of major commercial crops of the project location showed very wicked picture where the producers’ share was found even less than one fifth of the consumer rupee in some cases. In order to reduce distressed sale and length of marketing chain the producers were trained and motivated in primary processing and were linked with innovative farmers and already established entrepreneurs for marketing and enhanced profitability. Screening for scalability of farmers’ innovations and efforts for their institutionalization implied need for creation of platform for exchange of information and experiences, developing and disseminating theme-based knowledge products and undertake analysis of partner institutions to assess their potential as participants and building capacity of partner institutions. The framework for agri-enterprise development for maximizing farm profitability was found to be the function of entrepreneurial competencies, entrepreneurial climate, and farmers’ innovations.

REFERENCES
Brigidletty, Zanele Shezi and Maxwell Mudhara .2012. Agricultural grassroots innovation in South Africa: Implications for indicator development. Ideas for new research projects on LICS in Africa. African Globelics Seminar, Tanzania.
Cooley L and Ved R.2012. Scaling up – from vision to large-scale change: A management framework for practitioners. Management Systems International, Results for Development Institute, Washington, DC.
Dabson B, Malkin J, Matthews A, Pate K, and Stickle S. 2003. Mapping rural entrepreneurship. Battle Creek, MI: W. K. Kellogg Foundation; and CFED, Washington DC.
Das L, Nain M S, Singh R and Burman R R .2015. Effectiveness of backward and forward linkage in fruit cultivation: A study of NERAMAC. Indian Journal of Extension Education 51(1&2):70–74.
FAO (Food and Agriculture Organization of the United Nations). 1997. Higher agricultural education and opportunities in rural development for women – An overview and summary of five case studies. M. Karl, Rome.
Fuentes and Ernst Berg. 2013. Impact assessment of agricultural innovations: a review. Agronomía Colombiana 31(1): 120–30.
Hills G E, Lumpkin G T, and Singh R P. 1997. Opportunity recognition: Perceptions and behaviors of entrepreneurs. Frontiers of Entrepreneurship Research 17(4): 168–82.
Kulawczuk P. 1998. The transfer of power: Decentralization in central and eastern Europe, pp 97–109. The Development of Entrepreneurship in Rural Areas. J D Kimball, (Ed.). The Local Government and Service Form Initiative, Budapest.
McClelland D C. 1969. A Text Book on “Entrepreneurial Development. S Chand and Company Ltd, Ram Nagar, New Delhi.
Millaar Joanne and Connell John. 2010. Strategies for scaling out impacts from agricultural systems change: the case of forages and livestock production in Laos. Agriculture and Human Values 27:213–25.
Nain M S, Singh R, Sharma J P, Burman R R and Chahal V P. 2015. Participatory identification and prioritization of agri enterprises in national capital region of India. Indian Journal of Agricultural Science 85(6):787–91.
Nain M S, Singh R, Misra J R and Sharma J P. 2015. Utilization and linkage with agricultural information sources: A study of palwal district of Haryana State. Journal of Community Mobilization and Sustainable Development 10(2): 152–6.
Nain M S, Singh R, Misra J R and Sharma J P.2018. Scandibility of farmer led innovations (FLIs): A study of perceived determinants and required capacities. Indian Journal of Agricultural Sciences 88(8): 1312–5.
Singh R, Sharma T R, and Sharma K. 1994. Production and marketing of Hill vegetables: a study of Himachal Pradesh. Indian Journal of Agricultural Marketing 37(2): 23–8.
Singh R,Nain M S, Sharma J P, Misra J R and Burman R R. 2014. Institutional convergence of synergistic strengths for developing women agripreneurs. Indian Journal of Extension Education 50 (3&4): 1–7
Singh R, Nain M S, Sharma J P and Mishra J R. 2016. Developing agripreneur for sustainable farm income: Action research Study on women farmers of Hapur district, Uttar Pradesh. Journal of Community Mobilization and Sustainable Development 11(1): 127–35.
Shankar Tara and Singh K M. 2016. An analysis of marketed surplus and price spread of cauliflower in S. Chotanagpur (Jharkhand) for sustainable financial inclusion of tribal farmers. MPRA Paper No. 78722, posted 23 April 2017 06:08 UTC. https://mpra.ub.uni-muenchen.de/78722/
Zacharakis A L, Reynolds P D, and Bygrave W D. 1999. Global entrepreneurship monitor: National entrepreneurship Assessment for the United States of America. Kauffman Center for Entrepreneurial Leadership, Kansas City, KS.