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Short Communication

Constraints faced by farmers in adopting improved vegetable production technologies

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Vegetable production in India constitutes around 60 per cent of its total horticultural production. India is the second largest producer of vegetables in the world next to China having an area of 9.40 million hectares producing 162.90 million tons of vegetables during the year 2013-14. Vegetables play an important role in building nutritional and livelihood security in rural and peri-urban households due to their shorter duration, high yield and high value, nutritional richness, early economic returns and ability to generate on-farm and off-farm employment. The major states growing vegetables are West Bengal, Uttar Pradesh, Bihar, Madhya Pradesh, Gujarat, Maharashtra, Odisha, Karnataka, Andhra Pradesh and Tamil Nadu accounting for around 77 per cent of the total national vegetable production. With current level of vegetable production in the country (162.2 million tons), population (1.27 billion) and considering 25% postharvest losses and 5% export and processing, per capita availability of vegetables in our country is 250 g as against 300 g recommended dietary allowance (RDA). Thus, there is a shortage of about 50 million tons of vegetables. With projected population of 1.33 billion in 2020, 1.46 billion in 2030, 1.57 billion in 2040 and 1.65 billion in2050, there will be a gap of 190, 210, 225 and 240 million tonnes ofvegetables by respective years. With increasing trends in processing and export, the production targets are likely to further increase (Anonymous 2015). There are some gaps that need to be filled to achieve the targeted production in vegetables, firstly the lower productivity of vegetables in India (17.32 t/ha) which is lower than the world average productivity in vegetables (19.5 t/ha). Secondly, lack of adoption of new, cost effective & resource efficient technologies in vegetable production and an appropriate policy framework to keep the interest of both vegetable growers and consumers. Keeping this in view, a study was undertaken to identify the constraints faced by farmers in adoption of improved vegetable production technologies.

ICAR-Indian Institute of Vegetable Research being a premier institute in vegetable research and extension had conducted many training programmes, exhibitions and demonstrations for vegetable growers at the main campus of the institute, KVKs and at villages during the year 2014-15. Vegetable growers from different parts of India participated in these activities who were the target group for the study. During such gatherings of vegetable growers, a survey was conducted through focus group discussions to analyze the constraints faced by the growers in adoption of improved vegetable production technologies. Focus Group Discussions were conducted for 345 farmers from Bihar and Madhya Pradesh during training programme at institute and 834 farmers during Farmers' Interface of 50 villages in Sonbhadra, Varanasi, Mirzapur, Jaunpur, Gazipur, Chandauli and Mau districts of Uttar Pradesh. Open-ended questions were raised and farmers were left for discussion on different constraints they faced in adoption of different vegetable production technologies and identification of major problems were highlighted among them and were asked to give the preference/ agree to the problems raised. The total respondents for this study were 1179 and the results were classified into 04 major categories viz, Social Constraints, Technological Constraints, Economic Constraints and Organizational Constraints.

Table 1 indicates the rank order of social constraints. First three social constraints are related to entrepreneurial characteristics of the vegetable growers. Adopting any innovative technology is risky affair. Lack of entrepreneurial ability (85.07%), less achievement

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Table 1: Social constraints faced by vegetable growers in adoption of improved production technologies

S. No.	Social constraints	Respondents		
		Number	Percentage	Rank
1	Lack of entrepreneurial ability	1003	85.07	I
2	Lack of achievement motivation	984	83.46	II
3	Lack of innovativeness	983	83.38	III
4	Non-availability of cultivable land as well as Lack of land consolidation	967	82.02	IV
5	Lack of commitment & coordination among farmers	967	82.02	IV
6	Lack of responsiveness	944	80.07	V
7	Low adoption from neighbors	938	79.56	VI
8	Poor sources of information	927	78.63	VII
9	Groupism	921	78.12	VIII
10	Lack of education	854	72.43	IX

motivation (83.46%) and lack of innovativeness (83.38%) of the vegetable growers hinders them to adopt new technologies, because they have low risk bearing ability to try new technology. Impact of modern technologies like mechanization, drip irrigation, sprinkler irrigation is significantly visible when adopted in large scale. But according to 82.02% vegetable growers fragmented landholding impedes them to adopt these modern technologies. Other important social constraints are Lack of commitment & coordination among farmers (82.02%), Lack of responsiveness (80.07%), low adoption from neighbors (79.56 %), poor sources of information (78.63 %), Groupism (78.12 %) and lack of education (72.43 %) affecting the adoption of improved vegetable production technologies by farmers. Similar result was reported by Oinam and Sudhakar (2014).

Table 2: Technological constraints faced by vegetable growers in adoption of improved production technologies

S. No.	Technological Constraints	Respondents		
		Number	Percentage	Rank
1	Lack of technical know-how	1064	90.25	I
2	Poor knowledge of IPM	1059	89.82	II
3	Lack of location & crop specific recommendation	987	83.72	III
4	Inadequate demonstration of new technology	973	82.53	IV
5	Inadequate follow-up services	924	78.37	V
6	Inadequate training programme	916	77.70	VI
7	Lack of regular soil testing & Inadequate soil management	901	76.42	VII
8	Lack of post-harvest technology	887	75.23	VIII
9	Lack of mechanization in agriculture	879	74.55	IX
10	Inadequate availability of mass media sources of information	881	74.72	X
11	Lack of knowledge on conserving of natural resources	871	73.88	XI

Technological constrains which hinders the adoption of new technologies are given in table 2. Vegetable is short duration crop and very sensitive in nature. It requires intensive care from nursery to harvesting. Proper technical knowledge is required in every stage of vegetable farming. According to 90.25% respondents' lack of technical know-how was the major constraint among technological constraints. Increasing vegetable production with rational use of chemicals is the objective of modern agriculture. In this line, poor knowledge of IPM is another important problem as indicated by 89.82% vegetable growers. India is a country of diverse agro-climatic conditions. Growing vegetables in different parts of the country requires location and crop specific recommendation. According to 83.72% respondents location and crop specific recommendations are lacking. Other major problems identified under this category were inadequate demonstration of new technology (82.53%), follow up services (78.37%), inadequate training programme (77.70%), irregular soil testing (76.42%), lack of post-harvest technology (75.23%), lack of mechanization (74.55 %), inadequate sources of information (74.72%) and lack of knowledge on resource conservation (73.88%). Similar result was reported by Badhe and Saiyad (2011).

Vegetables are high value crops yielding early economic returns. However, adoption of new technologies which are cost effective and resource efficient can further increase the profitability in vegetables. In economic constraints category, high cost of technology (84.05%), low purchasing power of the farmers (73.54%), non-availability of agricultural credit, complicated procedure in available loans (65.39%), poor packaging and transportation (61.32%) were the major problems identified in the study. Similar result was reported by Malathesh et al. (2009). Social acceptability of any technology is very important for its adoption. There were many social issues which hindered the adoption of new technologies. First of them was non-availability of quality inputs in time (96.77%) which is associated

Table 3: Economic constraints faced by vegetable growers in adoption of improved production technologies

S. No.	Economic Constraints	Respondents		
		Number	Percentage	Rank
1	High cost of technology	991	84.05	I
2	Low purchasing power of farmers	867	73.54	II
3	Non-availability of agriculture credit	783	66.41	III
4	Complicated procedure in available loans	771	65.39	III
5	Poor packaging & transportation	723	61.32	IV

Table 4: Organizational constraints faced by vegetable growers in adoption of improved production technologies

S. No.	Organizational constraints	Respondents		
		Number	Percentage	Rank
1	Non-availability of quality inputs in time	1141	96.77	I
2	Lack of effective supervision and monitoring by extension worker	993	84.22	II
3	Poor linkage with line departments	931	78.97	III
4	Lack of timely advice and guidance by extension personnel	927	78.63	IV
5	Low credibility of ext. worker	923	78.29	V
6	Inadequate storage facility	881	74.72	VI
7	Inadequate marketing net works	877	74.39	VII
8	Lack of crop insurance facility	813	68.96	VIII

with other factors like inadequate marketing network (74.39%), poor linkage between line department (78.97%), inadequate storage facility (74.72%). Other important social constraints are related to inadequacy of extension and advisory services required by the farmers to adopt new technologies. Similar results were reported by Jadhav and Karjule (2007).

Proper technical knowledge is required in every stage of vegetable farming. Without adoption of improved technologies, it is not possible to bridge the gap of 240 million tonnes vegetable production by the year 2050 for ensuring nutritional security of the Indian population. Though there are many effective technologies available, but farmers adopt a few. There are several constraints associated which impedes its adoption. Important social, technological, economic and organizational constraints identified in the study need to be addressed according to the priority to enhance adoption of improved technologies in vegetable production. Policy issues need to be rejuvenated to overcome different social constraints, economic constraints and organizational constraints. Proper training programmes and adequate number of demonstrations need to be organized along with providing awareness and technical information to overcome technological constraints.

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