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# Constraints Faced by Vegetable Growers in Adoption of IPM in Bundelkhand Region of Uttar Pradesh

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## ABSTRACT

The new approach in IPM technologies required enhance knowledge and understanding of the small farmers regarding the biological and other factors and ecological interactions. The present study revealed that among the various types of constraints faced by vegetable growers regarding the adoption of IPM technologies included lack of knowledge of IPM technology followed by the lack of knowledge regarding pesticides and their application pattern, lack of knowledge of the respondents regarding the bio-pesticides or other alternatives. High cost of inputs (seed, plant, seedling, fertilizer, pesticides, labour etc.) under the category of socio-economic constraints, lack of proper marketing facilities under the category of institutional and infrastructural constraints, and inadequate number of demonstration of new technologies under the category of extension communication constraints, were major constraint perceived by the respondents.

**Keywords:** Constraints, IPM techniques, Vegetable growers

## INTRODUCTION

Integrated Pest Management (IPM) also known as integrated pest control (IPC) is a broad bashed approach that regulate or practices for economic control of pests. IPM aims to suppress pest population below the economic injury level (EIL). Its basic concern is with designing and implementing pest management practices in such a way that meet the goals of farmers (to protect from pests and enhance production), consumers (to consume pest and pesticide free agricultural produces) and governments (to sustain ecology and environment). While reducing loses from pests at the same time, safeguarding against the longer term risk of environmental pollution, hazards to human health, and reduced agricultural sustainability. The philosophy and ideas of IPM are now widely accepted in the political and scientific arena, the practical implementation of IPM has proved far more difficult to achieve. Over two decades, attempts to develop and disseminate IPM technologies in the developing countries have met with limited success (Yudelman *et al.*, 1998; Kiss and Meerman, 1991). In India farmers are not adopting and accepting the principles and ideas of IPM. A number of reasons for this limited success were identified by the different researchers. Some basic reasons like insufficient extension resource to serve the needs of the farmers who wish to employ IPM (Brader, 1979), need for more emphasis on farmers training to get the IPM message across (Kenmore, 1987) and so on were identified by early researches.

Commercial pressures on farmers to use pesticides, and the idea that pesticides companies disrupt IPM research and implementation activities could be important in specific cases. More appropriate and

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important reason for a lack of knowledge of IPM, adoption of the IPM 'product' is often not appropriate to farmers' need (Goodell, 1984), farmers may perceive IPM as too complex, expensive, risky, and just not appropriate to their farming system. The various researchers and reports indicated that many countries where excessive and indiscriminate use of the pesticides resulted adverse effects on the human being, other living, non-living and on environment. So, it is of utmost necessity for the scientific community to find out and analyze the field level constraints in the adoption of IPM technologies especially in the vegetable cultivation. Various researchers like Rashid *et al*. (2003); IPM DANIDA Project (2004); Kim and Park (2005); Baral *et al*. (2006) etc. reported that the excessive and injudicious use of pesticides. Keeping these in view the present study was conducted to study the constraints faced by the vegetable farmers in relation to adoption of IPM technologies.

## METHODOLOGY

The study was conducted at Banda district in Bundelkhand region of Uttar Pradesh having eight blocks namely Badokhar Khurd, Tindawari, Jaspura, Naraini, Bisanda, Baberu, Kamasin and Mahua. Among these eight blocks two block namely Badokhar Khurd and Mahua were purposively selected having potential of vegetable production and strategic location near the city area of Banda to fulfill the local demand of fresh vegetables. Eight vegetable growing villages 4 from each selected block were purposely selected. For this study 140 commercial vegetable growers having minimum 3 years of experience in vegetable cultivation were selected randomly. To collect information a schedule was specially developed. Participatory constraint analysis method was utilized where the respondent farmers were asked to mention the constraints, place the constraints in a four point continuum and rank them. Following the Participatory Approach as mentioned by Hubert (1991) with some suitable modifications, at first the respondents noted the constraints regarding the adoption of IPM technology according to their own wishes. Then formal method was adopted to measure the degree of constraints as experienced by the respondents in relation to the adoption of IPM technology and the respondents were asked to indicate on a four point continuum about the extent to which each constraint was perceived as crucial factor for adoption of IPM technologies for vegetable cultivation. The scores were assigned 3, 2, 1, and 0 for high, medium, low and not at all respectively. The rank score of each individual constraint as perceived by the respondents in relation to the adoption of IPM technologies was calculated by multiplying the frequencies with the respective weights of that particular constraint and later adding them up. On the basis of their respective rank scores, each constraint as experienced by the respondents in relation to the adoption of IPM technologies were rank ordered.

## RESULTS AND DISCUSSION

The field level constraints experienced by the respondents and their ranking (both category-wise ranking and overall ranking) of various field level constraints as perceived by the respondents regarding the adoption of the IPM technologies in vegetable cultivation was presented in Table 1. The data shows that among the infrastructural constraints lack of proper marketing facilities held the first rank position followed by inadequate irrigation facilities, lack of transportation facility, lack of timely availability of plant protection implements ranked second, third and fourth position respectively. It might be because of the fact without proper and organized marketing facilities, the vegetable growers were worried about to sell their produce due to perishability nature and get the remunerative price of their produce. If the farmers can be motivated and encouraged towards organic vegetable or pesticides free vegetable the prices of such produce may be quite high, but lack of proper market for organic produce demotivated and forced to apply the pesticides for increased level of protection from the pests and vis-à-vis increased yield of the various vegetable crops and thus the farmers tended to dissociate themselves from the adoption of IPM technologies in the vegetable cultivation.

Among the socio-economic constraints as perceived by the respondents high cost of inputs (seed, plant, seedling, fertilizer, pesticides, labour etc.) held the first

**Table 1: Ranking of various perceived constraints regarding the use IPM in vegetable cultivation**

| S.No. | Constraints | Rank score | Rank position within a particular category | Overall rank position |
|---|---|---|---|---|
| **A.** | **Institutional and Infrastructural Constraints** | | | |
| 1. | Lack of transportation facility | 210 | III | XVIII |
| 2. | Inadequate irrigation facilities | 285 | II | VII |
| 3. | Lack of proper marketing facilities. | 288 | I | V |
| 4. | Lack of timely availability of plant protection implements | 209 | IV | XIX |
| 5. | Lack of preservation and cold-storage facilities for the selected vegetables | 206 | V | XXI |
| 6. | Lack of proper plant protection implements | 183 | VII | XXIX |
| 7. | Lack of agricultural implements | 196 | VI | XXIII |
| 8. | Lack of research station, KVKs etc. | 103 | VIII | XXXVII |
| | **Total** | **1680** | | |
| **B.** | **Socio- Economic constraints** | | | |
| 1. | High cost of inputs (seed, plant, seedling, fertilizer, pesticides, labour etc.) | 309 | I | IV |
| 2. | Lack of timely availability of fund for arranging inputs. | 207 | V | XX |
| 3. | Lack of education of the vegetable growers | 189 | VI | XXVII |
| 4. | Lack of adequate remunerative price for output. | 215 | IV | XIV |
| 5. | Small size of land holding of the vegetable growers | 162 | VIII | XXXIII |
| 6. | Low profit from sale of vegetable crop. | 218 | III | XII |
| 7. | Lack or less of subsidies on inputs. | 227 | II | X |
| 8. | Lack of timely availability of labours | 176 | VII | XXXII |
| | **Total** | **1703** | | |
| **C.** | **Knowledge and Technological constraints** | | | |
| 1. | Lack of knowledge regarding pesticides & their application pattern. | 317 | II | II |
| 2. | Lack of knowledge of improved practices | 224 | IV | XI |
| 3. | Lack of technical know how | 211 | V | XVII |
| 4. | Lack of knowledge of accountancy management | 98 | VIII | XXXIX |
| 5. | Lack of Knowledge of IPM | 321 | I | I |
| 6. | Lack of knowledge of bio-pesticides or other alternatives | 311 | III | III |
| 7. | Lack of knowledge about the scientific term ETL | 181 | VI | XXXVI |
| 8. | Lack of knowledge of location specific technology | 107 | VII | XXX |
| | **Total** | **1770** | | |
| **D.** | **Extension communication constraints** | | | |
| 1. | Lack of knowledge about recent technologies. | 214 | IV | XV |
| 2. | Lack of regular visit of extension worker/scientist and VLWs at farmers field. | 115 | VIII | XXXIV |
| 3. | Inadequate demonstration of new technologies. | 287 | I | VI |
| 4. | Lack of mass-media contact. | 217 | III | XIII |
| 5. | Lack of personal contact with Ag.expert / and progressive farmers | 202 | V | XXII |
| 6. | Lack of interest in farmers fair, training and others activities. | 237 | II | IX |
| 7. | Not read any literature/ magazines related to agriculture | 178 | VII | XXXI |
| 8. | Lack of mutual co-operation among the vegetable growers | 195 | VI | XXIV |
| | **Total** | **1645** | | |

***Table 1 contd...***

| S.No. | Constraints | Rank score | Rank position within a particular category | Overall rank position |
|---|---|---|---|---|
| **E.** | **Environmental/ Natural constraints** | | | |
| 1. | High temperature | 193 | III | XXV |
| 2. | Low productive and unfertile soil | 212 | II | XVI |
| 3. | Low rain fall | 190 | IV | XXVI |
| 4. | Lack of natural sources of water (river, lake, canal) | 111 | VI | XXXV |
| 5. | Unwanted animals | 259 | I | VIII |
| 6. | Lack of forest and vegetation | 187 | V | XXVIII |
| 7. | Topography of land | 100 | VII | XXXVIII |
| | **Total** | **1252** | | |

rank position followed by lack or less subsidies on inputs, low profit from sale of vegetable crop, lack of timely availability of fund for arranging inputs, small size of land holdings of vegetable growers, lack of timely availability of labours, age and experience of vegetable growers, non-availability of insurance when crop fails, lack of education of the vegetable growers, lack of adequate remunerative price for output. This was apparently because the cost of vegetable inputs like hybrid seeds or seedlings, fertilizers especially micro nutrients, bio and chemical pesticides and labors were high, sometimes farmers were unable to purchase these inputs for better produce.

Among the knowledge and technological constraints as perceived by the vegetable growers lack of knowledge of IPM/ INM held the first rank position, closely followed by the lack of scientific knowledge of farming, and lack of technical know-how. Lack of proper information and guideline on the judicious use of pesticides, lack of knowledge of bio-pesticides and other alternatives, lack of farmers' friendly technology, lack of knowledge of scientific institutions, lack of self will power, and lack of accountancy management were other reasons. The fact that the lack of knowledge of the vegetable growers about the Integrated Pest Management and Integrated Nutrient Management concept for the vegetable cultivation might that without the knowledge and importance of the Integrated Pest Management concept in agriculture, the farmers were prone to use the chemical pesticides more in numbers, frequency and quantity in the vegetable cultivation than the recommended and permitted doses.

Among extension communication constraints as perceived by the respondents, the lack of knowledge about recent technologies related to IPM in vegetable production enjoyed the first rank position, followed by the inadequate demonstration of new technologies related to vegetable crops in the second position. Low mass-media contact of the farmers, lack of interest in farmers fair and training, lack of personal contact with scientist/ Agril. Expert / Progressive farmers, poor reading behaviour of literature/ magazines related to agriculture and lack of regular visit of extension worker/scientist and VLWs at farmers field got decreasing position respectively. The farmers' unwillingness about recent trends in agriculture as well as scientific temperaments of farmers towards the farm activities might have led to poor knowledge. Even very few among the farming communities took initiative regarding the hazardous effects of agro chemicals and precautions to be taken in the case of toxicity related accidents. Another major factor in extension communication constraints were exposure of mass media and interest of farmers in training, farmer's fair and other extension activities vegetable growers is very low.

Among the environmental/ natural constraints the unwanted animals were major constraints faced by vegetable growers followed by the low productive and unfertile soil, high temperature, low rain fall and erratic

**Table 2: Major categories of perceived constraints regarding the adoption of IPM technology in vegetable cultivation**

| S.No. | Major categories of constraints | Total Rank Score | Percentage | Rank position |
|---|---|---|---|---|
| 1 | Institutional and Infrastructural Constraints | 1680 | 20.87 | III |
| 2 | Socio- Economic constraints | 1703 | 21.16 | II |
| 3 | Knowledge and Technological constraints | 1770 | 21.99 | I |
| 4 | Extension communication constraints | 1645 | 20.43 | IV |
| 5 | Environmental/ Natural constraints | 1252 | 15.55 | V |
| | **Total** | **8050** | **100** | |

distribution, lack of forest and vegetation and lack of natural sources of water (river, lake, canal) respectively. This might be due to that the stray animal specially cattle population is almost equal to human population in Bundelkhand region and at the same time the majority of the animals were not or less productive so the farmers were not interested in such animals thus released from their farms. The feed and fodder of these animals were not managed by farmers under those circumstances cattle managed their feed from other sources like crops and others vegetation in the field.

Among all the various types of constraints perceived by the respondents regarding the adoption of IPM technologies in vegetable production, the lack of knowledge of the respondents (vegetable growers) about the Integrated Pest Management (IPM) in the vegetable crops (under the category of knowledge and technological constraints) got the first rank position closely followed by the lack of knowledge of the respondents regarding scientific knowledge of farming, the lack of knowledge of the respondents about the technical know-how related to Integrated Pest Management (IPM) in the vegetable cultivation, closely followed by unwanted animals which is major problems for vegetable growers in cultivation of vegetables and adoption of IPM technology (under category of environmental/ natural constraints). It can be said from the above results, that the lack of knowledge of the respondents (vegetable growers) about the Integrated Pest Management (IPM), scientific knowledge of farming and technical know-how related to Integrated Pest Management (IPM) in the vegetable cultivation put the most compelling hurdle before the vegetable growers regarding the adoption of IPM technologies in the vegetable production.

Table 1 and 2 clearly showed us that among five numbers of different categories of perceived constraints regarding the adoption of IPM technologies in vegetable cultivation, knowledge and technological constraints with a rank score of 1835 got first rank position, distantly followed by socio-economic constraints with a rank score of 1724 in the second position, infrastructural constraints with a rank score of 1585 in the third position, extension communication constraints rank score of 1467 in the fourth position and it was interesting and surprisingly to note that environmental/ natural constraints were at the last position with 1154 rank score. It is fact that the knowledge and technological constraints held the highest position among different categories of constraints perceived by the vegetable growers might be because of the reason that the respondents had very poor level of knowledge regarding the IPM and the adoption in vegetable cultivation. The above results also showed that various socio- economic constraints, extension communication constraints and infrastructural constraints on the part of farmers, government organizations and institutes they do not contributed to a great extent to the low level of adoption of IPM technologies in vegetable cultivation among the growers. The results also revealed that the respondents were technologically poor in knowledge as well as they were facing various problems in the communication processes to adopt the IPM technologies in vegetable cultivation.

## CONCLUSION

The present study showed that among five different categories of perceived constraints regarding the

adoption of IPM technologies in vegetable cultivation the knowledge and technological constraints were major constraint (21.99%) perceived by the respondents, followed by the socio- economic constraints (21.16%), infrastructural constraints (20.87%), extension communication constraints (20.43%) and environmental/ natural constraints (15.55%). The interpretation of the data revealed that lack of knowledge of the respondents about the of IPM technology in vegetable crops, lack of knowledge of respondents regarding pesticides and their application pattern, lack of knowledge of bio-pesticides or other alternatives, high cost of inputs (seed, plant, seedling, fertilizer, pesticides, labor etc.), lack of proper marketing facilities, inadequate demonstration of new technologies about the Integrated Pest Management (IPM) techniques for the cultivation of the vegetables put the most intimidating hurdle before the respondents regarding the adoption of IPM technologies in the vegetable cultivation. It may be recommended and suggested that the introducing IPM in Bundelkhand region through various methods for transfer of technology is need of hours. The present study also revealed that the biggest constraint before the respondents was related to knowledge and technological constraints, so to achieve the wide spread adoption of IPM technologies by the farmers a location specific and demand driven technologies should be promoted strategically and it should be put forward and implemented by all the concerned.

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