



Awareness level of smart agricultural practices (SAPs) in Haryana

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ABSTRACT

The present study was carried out in Haryana state of India. Empirical data was collected personally through an interview schedule to assess the awareness level of Smart Agricultural Practices (SAPs). Study concluded that farmers' awareness level was high about nearest soil and water testing laboratories with weighted mean score (WMS) 2.55, soil health card to know the soil health (2.02), high yielding varieties (2.09), SMS services provided by CCS Haryana Agricultural University (CCS HAU), Hisar (1.78), crop diversification to reduce risk of crop failures (1.87), harvested water for use for irrigation and drinking (1.83), agro-forestry which provides healthy environment and extra income (2.24), burning of crop residue which degrade the environment (2.31), agro processing to get good price (1.88) and, protected cultivation to provide off season products (2.19). Study also concluded that land holding, farming system, mass media exposure, extension contact, risk orientation, economic motivation, and innovation proneness with the awareness level had positive and significant correlation at 0.05 level of probability.

Key words: Awareness, Climate, SAPs

Agriculture constitutes important part of Indian economy and about two-thirds population of India is directly or indirectly depends on agriculture and allied activities for their livelihoods. While, about, 85 % farmers come under the category of small and marginal land holding. On the other hands, demands are growing on agricultural land for food, fibre, and fuel is predicted to increase exponentially in coming decades with continued population growth (Bommarco *et al.* 2013). Thus, population growth rate of 1.58 %, India is predicted to have more than 1.53 billion people by the end of 2030. Whereas, natural resources such as land, water, forests, livestock, fisheries are deteriorating and degrading at a very fast rate due to unmindful agricultural intensification, imbalanced use of fertilizers, overuse and inefficient use of irrigation water and deforestation. While, inadequate marketing channels and infrastructure, long intermediation, lack of accurate and timely market information system etc. are major challenges to the agricultural marketing system in the country. Therefore, there is immense need of smart agricultural practices (SAPs) to enhance the production and productivity to feed the continuous increasing population through sustainable use of natural resources along with to reduce the input cost, increase the net profit, and generate employment.

Keeping in view the above facts and importance the study was conducted with objective to assess the awareness level of SAPs in Haryana state of India.

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MSATERIALS AND METHODS

The study was conducted in Haryana state of India in 2017. Data was collected from two districts, viz. Hisar from south-west zone and Kaithal from north-east zone. From Hisar and Kaithal, three villages were selected from each district, randomly. Thus, six villages namely, Ladwa, Shahrwa and Rawalwas Khurd villages from Hisar, while, Kaul, Rasina and Bhana villages from Kaithal were selected, randomly. Further, 30 farmers were selected, randomly from each selected village. Thus, a total number of 180 respondents were interviewed for the present study. The data were collected with the help of well-structured and pre-tested interview schedule prepared especially for present study. Data was analyzed by Statistical Package for the Social Sciences (SPSS). Weighted mean score, rank orders, standard deviation, correlation and regression were computed for the better understanding. The responses of farmers' were obtained on three-point continuum scale in case of awareness (fully aware, aware and not aware) and scores were given as 3, 2 and 1, respectively. After that frequency was multiplied with the score (3, 2 or 1) and total weighted score was obtained and total weighted score was divided by total respondents (180) for obtaining weighted mean score (WMS) and according to weighted mean score rank order were given.

RESULTS AND DISCUSSION

Farmers' awareness towards soil and water testing

It is evident from the Fig 1 that farmers had high

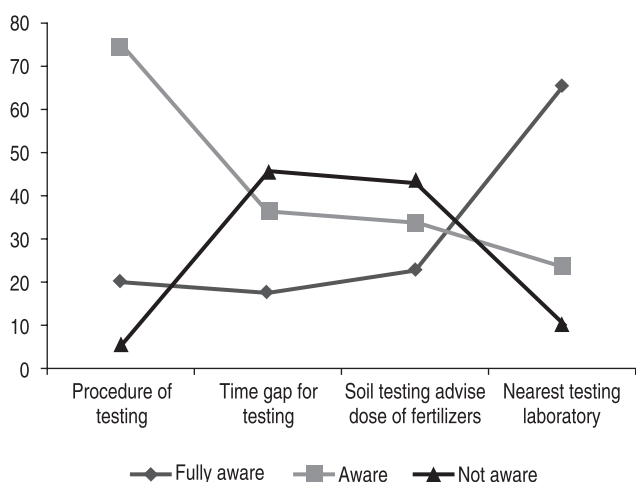


Fig 1 Farmers' awareness towards soil and water testing.

awareness about 'nearest soil and water testing laboratories' ranked 1st with weighted mean score (WMS) 2.55, followed by 'procedure of soil and water sample for testing' and 'soil testing advise dose of fertilizers' ranked 2nd and 3rd with WMS 2.14 and 1.79, respectively. Awareness level was low in case of 'time gap for soil and water testing' ranked 4th with WMS 1.72. Awareness level of farmers about soil and water testing was high may be possibly due to the active participation of government through launching of various schemes which facilitates farmers to get their soil and water samples tested at low cost in minimum time. Whereas, knowledge about time gap for soil and water testing was lowest among farmers due to low frequency of experts visit at farmers' fields/farms. Soil testing has been accepted as an important tool in agricultural management practices among farmers and recommendations based on soil fertility status analysis, which helps the farmers to the increase nutrient use efficiency and enhance the agricultural production and productivity (Sims *et al.* 2000).

Farmers' awareness towards soil health card (SHC)

It is depicted from Fig 2 that 'SHC helps to know the soil health' was ranked 1st with highest weighted mean score (WMS) 2.02, followed by 'SHC encourage judicious

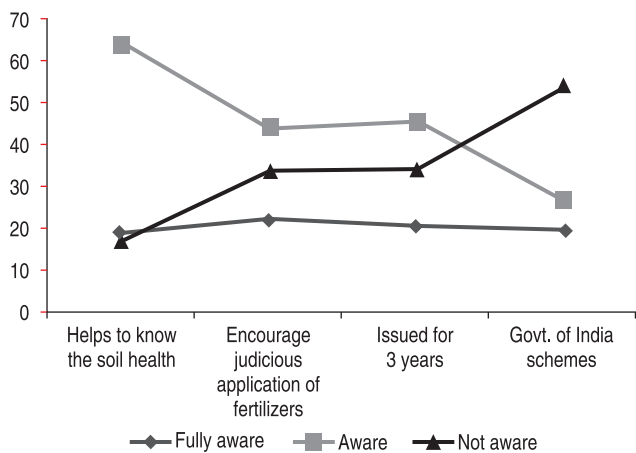


Fig 2 Farmers' awareness towards SHC.

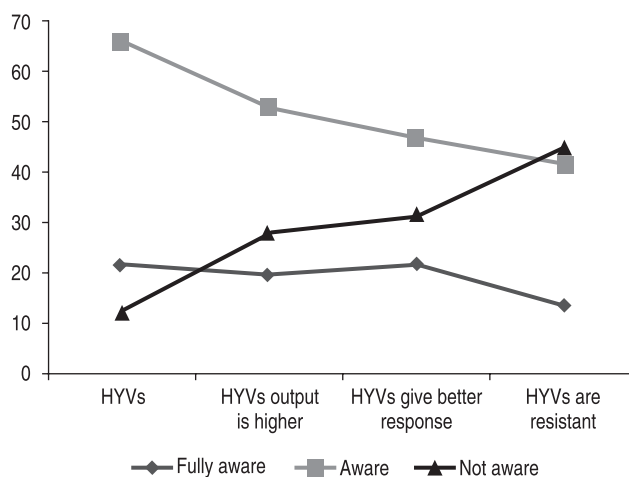


Fig 3 Farmers' awareness towards HYVs.

application of fertilizers', 'SHC is issued for 3 years' and 'SHC is a Government of India scheme' ranked 2nd, 3rd and 4th with WMS 1.88, 1.87 and 1.66, respectively. The reason behind the high awareness about SHC scheme may be because it was recently launched by Government of India and awareness campaigns supported by appropriate advertisements through state and center agencies were organized to increase the importance and adoption of SHC. Secondly, most of the farmers are regularly in contact with local extension personnel of State Agriculture Department. The study got strength from the findings of Dwivedi and Meena (2015) who reported that that soil testing under SHC suggest farmers about judicious application of fertilizers at appropriate time.

Farmers' awareness towards high yielding varieties

Data in Fig 3 showed that farmers had high awareness level about 'high yielding varieties (HYVs)' ranked 1st with weighted mean score (WMS) 2.09, followed by 'HYVs output is higher than others', 'HYVs give better response to inputs' and 'HYVs resistant to insect pests and diseases' ranked 2nd, 3rd and 4th with WMS 1.92, 1.90 and 1.68, respectively. Awareness and adoption of HYVs has increased spectacularly in India after green revolution. Kasarlwar *et al.* (2009) and Bishaw *et al.* (2011) also reported similar findings.

Farmers' awareness towards weather forecasting

Fig 4 revealed that 'SMS services provided by CCS HAU, Hisar' ranked 1st with highest weighted mean score (WMS) 1.78, followed by 'usefulness of weather forecasting', 'source of weather forecasting' and 'toll free numbers of different agencies' ranked 2nd, 3rd and 4th with WMS 1.69, 1.57 and 1.34, respectively. Higher awareness among farmers about these services possibly may be due to the reason that mostly farmers visited the *kisan mela* (Farmers Fair) organized by state agricultural university (SAU) or other agencies and registered them self for SMS services provided by the SAU. Falaki *et al.* (2011) and Narain *et al.* (2015) also reported similar findings.

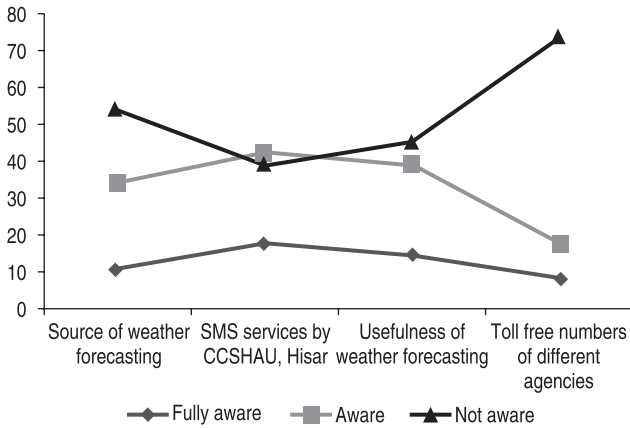


Fig 4 Farmers' awareness towards weather forecasting.

Farmers' awareness towards crop diversification

The examination of the data presented in Fig 5 indicated that 'crop diversification helps to reduce risk of crop failures' ranked 1st with highest weighted mean score (WMS) 1.87, followed by 'crop diversification promotes use of resources', 'helps to generate employment and income round the year' and 'crop diversification helps to sustain soil health' ranked 2nd, 3rd and 4th with WMS 1.84, 1.64 and 1.62, respectively. However, awareness level was low about 'helps to increase the production' ranked 5th. Farmers' awareness belongs to high to low category because state agriculture department is still working on framework and guidelines that ultimately leads to increase the awareness level of diversification and seed of maize along with financial help is provided to farmers from the government. There is more need to emphasize on the awareness aspects among farming community about such critical issues in present day intensive agricultural practices and study got strength from the research findings of Salau and Ayanda (2014).

Farmers' awareness towards water harvesting

Fig 6 clearly shows that awareness level among farmers was high about 'harvested water can be used for irrigation and drinking' ranked 1st with weighted mean score (WMS) 1.83, followed by 'helps to recharge the ground water table', 'benefits of water harvesting', and 'improve quality of ground water' ranked 2nd, 3rd and 4th with WMS 1.79,

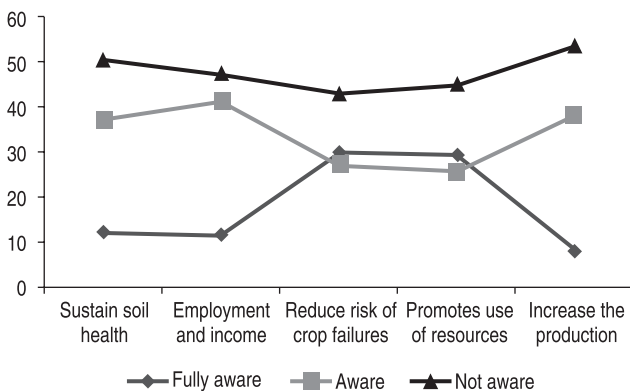


Fig 5 Farmers' awareness towards crop diversification.

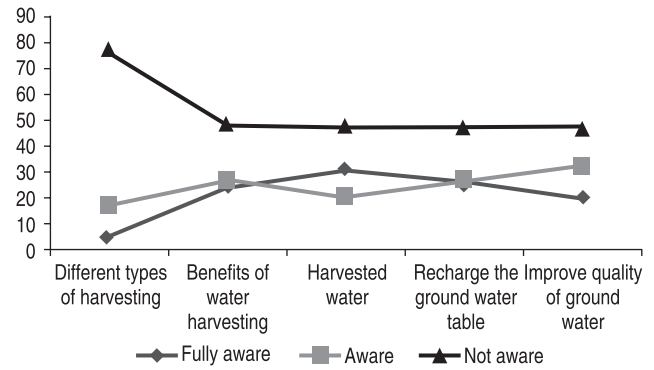


Fig 6 Farmers' awareness towards water harvesting.

1.76 and 1.72, respectively. Moreover, awareness was low in case of 'different type of water harvesting' ranked 5th with WMS 1.27. The low awareness among farmers might be because there is no awareness campaign by government as well as state agricultural universities to adopt appropriate management practices for harvesting rainwater. The research findings were opposed by the research finding of Sangeetha (2012) who concluded that awareness about rainwater harvesting was high among the students of higher secondary schools.

Farmers' awareness towards agro-forestry

Fig 7 elaborates that 'provide healthy environment and extra income' ranked 1st with highest weighted mean score (WMS) 2.24, followed by 'agro-forestry systems advantageous over conventional agricultural' ranked 2nd with WMS 2.19. However, 'reduces land degradation and soil erosion', 'restoring the soil fertility' and 'reduces irrigation requirement' ranked 3rd, 4th and 5th with WMS 1.72, 1.69 and 1.66, respectively. Awareness level of farmers may be high due to active participation of agriculture department in providing awareness among the farming community. Study got strength from the study of Pant (2011) and Gyau et al. (2014).

Farmers' awareness towards eco-friendly agricultural practices

The results presented in Fig 8 show that awareness of eco-friendly practices highlights that mostly farmers were aware about 'burning of crop residue degrade the environment' ranked 1st with weighted mean score

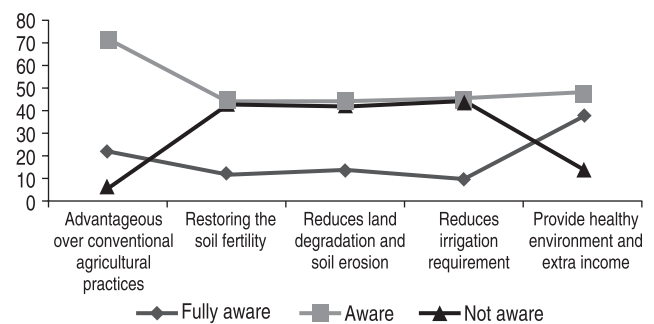


Fig 7 Farmers' awareness towards agro-forestry.

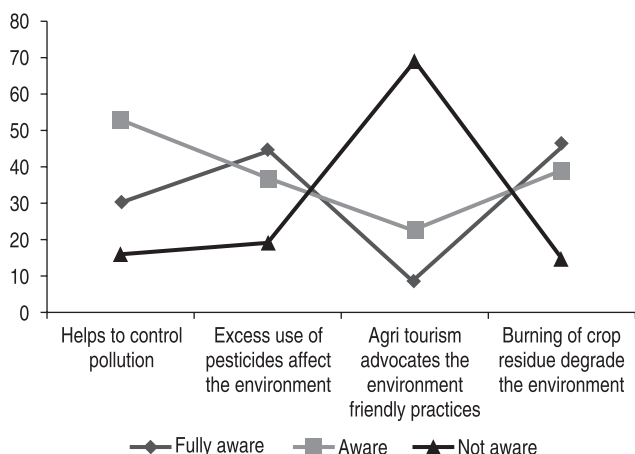


Fig 8 Farmers' awareness towards eco-friendly agricultural practices.

(WMS) 2.31, followed by 'excess use of pesticides effect the environment', 'eco-friendly practices helps to control pollution' and 'agri tourism advocates the environment friendly practices' ranked 2nd, 3rd and 4th with WMS 2.24, 2.14 and 1.39, respectively. Awareness level about agri tourism can be increases by organizing awareness campaign at village level. Rani and Murugan (2010) and Kibue *et al.* (2015) also advocates about awareness programs, subsidy and technical support for adoption of eco-friendly practices.

Farmers' awareness towards agro-processing

Fig 9 narrated that 'agro processing helps to get good price' ranked 1st with highest weighted mean score (WMS) 1.88, followed by 'helps to increase extra farm household income' ranked 2nd with WMS 1.86. However, 'provide employment to rural poor', 'helps to provide nutritive healthy food products' and 'helps in value added hygienic quality food products' ranked 3rd, 4th and 5th with WMS

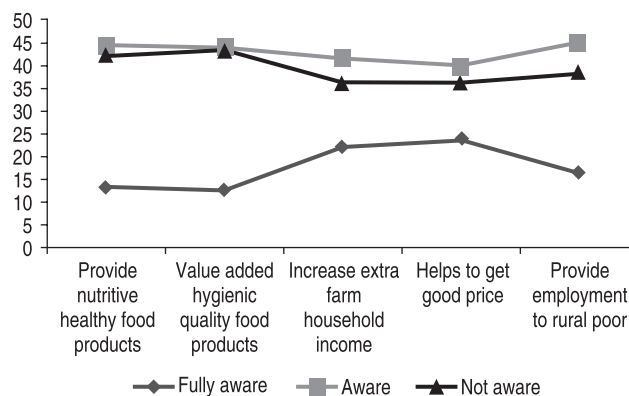
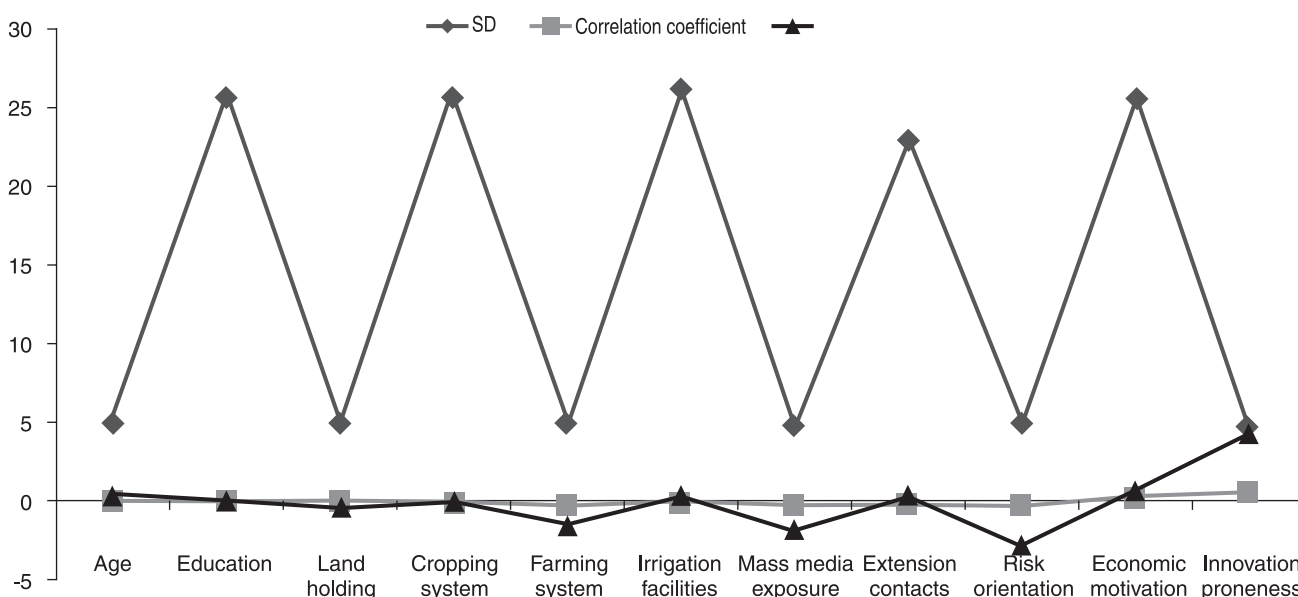


Fig 9 Farmers' awareness towards agro-processing.

1.78, 1.71 and 1.69, respectively. Farmers' awareness and its better adoption can be increased through proper guidance about these practices by organizing awareness campaign and other mean of awareness etc. In context with results of present study, findings of Kumar *et al.* (2016) also suggested that there is need of comprehensive strategy, which include development of physical, functional and market infrastructure along with provision of single window system, tax rebate and export subsidy need to develop to boost agro processing in the state.

Farmers' awareness towards protected cultivation

The result depicted that 'helps to provide off season products' ranked 1st with highest weighted mean score (WMS) 2.19, followed by 'helpful to protect the crop from natural hazards', 'which crop can be grown under protected cultivation', 'technique to keep temperature in controlled condition', 'promotes the quality of products', and 'type of protected cultivation' ranked 2nd, 3rd, 4th, 5th and 6th with WMS 1.99, 1.91, 1.89, 1.86 and 1.84, respectively.



Dependent variable- Awareness; *Significant at 0.05 levels, R2=0.77, Constant value= 9.45

Fig 10 Relationship between farmers' awareness level and their personality traits.

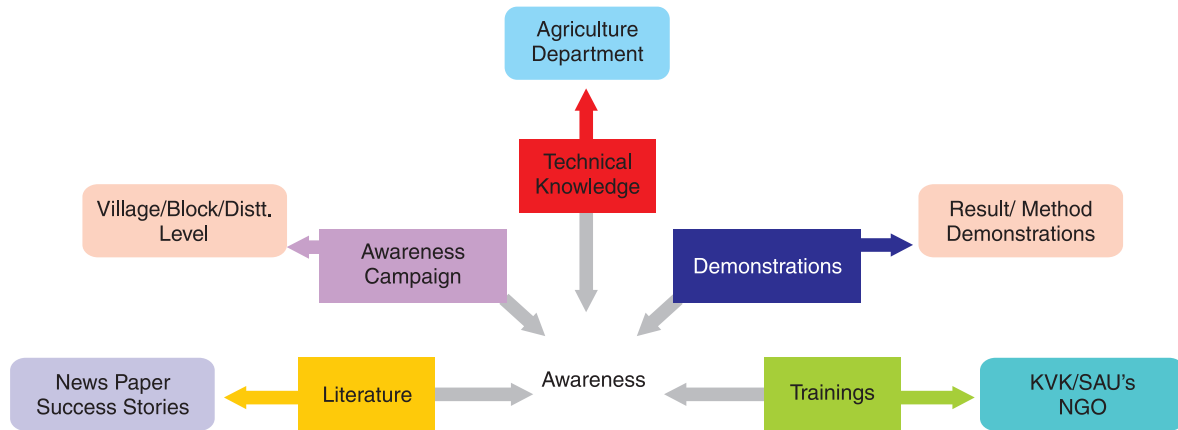


Fig 11 Strategies to enhance the awareness level of farmers towards SAPs.

Whereas, awareness level was low about 'major nematodes of protected cultivation' and 'major disease of protected cultivation' ranked 7th and 8th. More subsidies should provide by the government on polyhouse establishment so that farmers could be more familiar with these technologies and another factor of awareness such as off season vegetables and fruits in markets, which are grown in protected structures. The results are in agreement with those reported by Shweta *et al.* (2014) who suggested the benefits of protected cultivation.

Relationship between farmers' awareness level and their personality traits

Fig 10 showed that correlation coefficient between the different personality's traits like; land holding, farming system, mass media exposure, extension contact, risk orientation, economic motivation, and innovation proneness with the awareness level had positive and significant correlation at 0.05 level of probability. However, remaining traits namely age, education, cropping system, and irrigation facilities, did not show any significant association with the awareness towards SAPs. These findings were partially supported by the reports of Rajashekar *et al.* (2017). While in case of the partial regression coefficient farming system, irrigation facilities, mass media exposure, extension contact, risk orientation, economic motivation, and innovation proneness were found significant at 0.05 level of probability, whereas, age, education, land holding, cropping system, did not significantly contribute to the awareness towards SAPs. It was further revealed that all the eleven independent variables jointly contributed 77.00% variation in the awareness of the respondents regarding SAPs when other factors were kept constant. This implies that only 77.00% of the variation in the dependent variable was due to these variables included in the study and remaining 23.00% variations were due to other variables.

Strategies to enhance the awareness level of farmers towards SAPs

Present study concluded that farmers' were not aware about time gap for soil and water testing, SHC is

a Government. of India scheme, HYVs resistant to insect pests and diseases, toll free numbers of different agencies for weather forecasting, crop diversification helps to increase the production, different type of water harvesting, agro-forestry reduces irrigation requirement, agri tourism advocates the environment friendly practices, agro-processing helps in value added hygienic quality food products and, major disease of protected cultivation.

Fig 11 showed that awareness towards smart agricultural practices could be increased through trainings, technical knowledge and demonstrations organized by KVKs or SAU's or any other organizations such as agriculture department or NGO's with farmers' active participation. Trainings and demonstrations helps the farmers to update their knowledge as well as to develop their skills. Campaigns conducted at village/block/district level and literature about smart agricultural practices gathered through newspaper or success stories will be helpful to increase the awareness level among farmers.

Conclusion

Present study concluded that there was a gap in awareness level of SAPs in farming community. It can increase through organizing continuous trainings, campaigns, lectures and demonstrations. In addition, a well-structured and sound national level planning can definitely enhance the farmers' awareness level regarding SAPs.

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REFERENCES

- Bommarco R, Kleijn D and Potts S G. 2013. Ecological intensification: Harnessing ecosystem services for food security. *Tree* 28: 230–8.

- Bishaw Z, Struik P C and Gastel A J G. 2011. Wheat and barley seed system in Syria: Farmers' varietal perceptions, seed sources and seed management. *International Journal of Plant Production* **5**(4): 323–47.
- Dwivedi B S and Meena M C. 2015. Soil testing service - retrospect and prospects. *Indian Journal of Fertilizers* **11** (10): 110–22.
- Falaki A A, Akangbe J A, Iyilade A O and Olowosegun T. 2011. Small scale farmers' perception and adaptation to climate change in Nasarawa State of Nigeria. *Agrosearch* **11** (1/2): 49–62.
- Gyau A, Smoot K, Kouame C, Diby L, Kahia J and Ofori D. 2014. Farmer attitudes and intentions towards trees in cocoa (*Theobroma cacao* L.) farms in Cote d'Ivoire. *Agroforestry Systems* **88** (6): 1035–45.
- Kasarlwar A, Parshuramkar S and Lanjewar D M. 2009. Adoption of improved paddy cultivation practices by tribal farmers. *Journal of Soils and Crops* **19** (2): 306–9.
- Kibue G W, Pan G, Zheng J, Li Z and Mao L. 2015. Assessment of climate change awareness and agronomic practices in an agricultural region of Henan Province, China. *Environment Development and Sustainability* **17** (3): 379–91.
- Kumar R, Dixit A K, Kumar A and Singh S. 2016. Agro processing industries in Haryana: Status, problems and prospects. *Economic Affairs* **61**(4): 707–15.
- Narain S, Singh A K and Gupta S. 2015. Farmers' distress in Uttar Pradesh, India - lesson from a research study. *International Journal of Bio Resource and Stress Management* **6** (2): 274–9.
- Pant N. 2011. Motivational factors in activities of agro forestry: A case study. *Indian Forester* **137** (3): 363–9.
- Rajashekar B, Sudharani V, Parveen S K N and Shivacharan G. 2017. Knowledge of farmers about integrated weed management (IWM) practices in major crops. *International Journal of Farm Sciences* **7** (1): 33–6.
- Rani A J and Murugan P P. 2010. Suggestions for the increase use efficiency of eco-friendly agricultural practices for sustainable paddy cultivation. *Agriculture Update* **5**(1/2): 103–5.
- Salau S A and Ayanda I F. 2014. The influence of cropping intensification on vulnerability to floods among farming households in Kwara State, Nigeria. *Journal of Sustainable Development in Africa* **16** (7): 142–52.
- Sangeetha S. 2012. Awareness towards rainwater harvesting among the students of higher secondary schools in Perambalur district-Tamilnadu. Master of Education thesis, Teachers Education University.
- Shweta, Bhatia S K and Malik M. 2014. Protected farming. *Popular Kheti* **2**(1): 74–9.s
- Sims J T, Edwards A C, Schoumans O F and Simard R R. 2000. Integrating soil phosphorus testing into environmentally based agricultural management practices. *Journal of Environmental Quality* **29**(1): 60–71.