



KNOWLEDGE LEVEL OF NORTH ANDAMAN FARMERS TOWARDS SCIENTIFIC VEGETABLE CULTIVATION PRACTICES-A CASE STUDY

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Abstract

In Andaman and Nicobar Islands, around 85% of the geographical area is covered under forest. The vegetable cultivation is practiced by N & M Andaman district farmers especially from Diglipur Tehsil as their main source of income during *Rabi* season in rice fallow lands. However, the productivity of vegetables is far below the level of mainland farmers. This is due to poor adoption of scientific cultivation practices by farmers. Thus, the present study was conducted in Diglipur Tehsil with 120 respondents selected from 8 villages using random sampling techniques. The results showed that 20 percent of farming community are youth and annual income of majority (47%) of farmers is medium and their education level is also very poor. These socio economic factors mainly attributed to their adoption behavior of cultivation practices. The vegetable cultivation significantly contributed (50 %) to the farmers income.

Among the respondents 88 per cent respondents were un aware of precision farming techniques which play a vital role in enhancing the productivity. In plant protection management, farmers have no knowledge about identification of pests and use of appropriate pesticides for their management. The Farmers use available one or as given by pesticide dealers thereby they incur monetary loss besides yield loss. Thus the average productivity is low as IPM play a vital role in crop production. Further it was found that majority of farmers still depend on private dealers to redress the pest problems. The correlation analysis with farmer's socio-economic factors and adoption of improved cultivation practices revealed that knowledge of respondents increased with the increase in their education and income. Educating the farmers through mass media training and demonstration will help the farmers in learning/adopting new technologies, which intern help them to increase their productivity level and their farming income on sustainable basis. Thus, it can be observed from this study that age, education and farming income influence much on motivation for learning and adoption level of farmers.

Introduction

India is the Second largest producer of vegetables which contributes 14 per cent of World production. It is possible to grow many types of vegetables as our country is blessed with distinct seasons with different agro climatic zones. The vegetables are highly helpful in combating the nutritional security of our population. They serve as a good source of nutrients, dietary fiber, Vitamins and phytochemicals. The Vegetable cultivation earns higher income to the farmers in a short span of time with a low capital investment. In India vegetables are grown in an area of 10,106 million ha with an annual production of 169.06mt and average productivity of 17.7 mt/ha.

The total geographical area of Andaman and Nicobar Islands is 8249 sq km of which 85 per cent area is covered

under forest. Unlike other parts of country, the tropical ecosystem of the A & N Islands is very unique with high rainfall, extremely humid climate, undulating terrain pose greater challenges for agriculturists and technocrats. The major crops grown in this Island are Paddy, Coconut, Arecanut, spices, fruits and vegetables. North and middle Andaman is a prominent district out of the three districts of Andaman and Nicobar Islands wherein good farming is practiced in an area of 7538 ha. In this district, out of the three tehsils, Diglipur tehsil is having major plain land and after the paddy crop, majority farmers practices vegetable cultivation in rice fallow lands as their main source of income. This practice of cultivation of vegetables after rice harvest has also been justified economically with their desire to go for a cash crop to

maximize overall profit curbing effect of rice yield, and the second culture practices control pest especially the rice stem borer in subsequent next culture rice cultivation (Khalil chabok and Nahid Amoli 2013). The major constraints for the vegetable cultivation are lack of irrigation facility during summer months, non/timely availability of quality seeds and other inputs and farmers poor knowledge of farmers about nutrition and pest management practices.

Further due to low population in the island (49 persons/Sq.km.) marketing of their produce during glut period is a major constraint due to 60 per cent of the population are living in the capital of Andaman & Nicobar Islands Port Blair which is 300 kms away from Diglipur. Due to non-availability of cold storage/ transportation facilities, farmers are not able to send their produce to distant markets like Port Blair and are deprived of getting proper price for their produce. The knowledge, experience and attitude of farmers transformed the growth of agriculture in mainland states. A study in Uttaranchal showed that 73.60% knowledge gap existed with respect to adoption of improved Agricultural practices (Chandra and Pandey, 2006). The other research studies (Subhasini and Thyagarajan, 2000; Singh *et al.*, 2002; Vaish *et al.*, 2003; Singh *et al.*, 2003) have revealed that socio-economic condition and psychological issues of farmers also influence the adaptation behavior, Shivrain and Dalal *et al.*, (1999) in a study observed that knowledge has been found to be an important factor contributing to adaptation of innovation by farmers. Keeping in view of this, a study was undertaken with the following objectives.

1. To assess the knowledge level of farmers related to scientific crop production practices.
2. To assess the farmers level of knowledge in INM and IPM technologies.
3. To study the constraints in the production and marketing of vegetables.

Methodology

The study was conducted in the year 2017-18 in Diglipur Tehsil of North and Middle Andaman district. In this tehsil, 08 villages representing major vegetable growing belt was selected in consultation of local line departments. A total of 120 farmers were selected randomly for the study with 15 farmers from each village. For the study, data was collected through a personal interview technique. The data was analyzed and tabulated using frequency and percentage.

During the data collection, preliminary information

regarding socio economic status, extent of area, method of irrigation, important enterprises of farming, annual income from vegetable cultivation were collected. The knowledge of farmers was measured using three point scale. The knowledge level was assumed using different parameters. To assess the knowledge level of vegetable growers information about market demand, seasonal requirement, knowledge about improved varieties/ hybrids seeds and their cost, precision farming techniques like nursery preparation, mulching, drip irrigation. Further the information about farmer's knowledge on INM and IPM practices were collected. The knowledge was evaluated in terms no knowledge, less knowledge and good knowledge as followed by researchers in their similar studies. In addition to this the information on age, education, annual income and income from vegetable were also collected. The data was analyzed and tabulated using frequency distribution method based on the personal interview.

Results and Discussion

The knowledge adoption is a social process (Rogers, 2003). The adoption behavior would be influenced by many factors like their social networks, personal circumstances, education and economic situations (Singh, *et al.*, (2011). This study showed that majority of respondents were in the age group of 31-55 years (55%). It was observed that only 20 per cent of youth (age < 30 years) are engaged in Agriculture which indicates that association/preference of youth population towards agriculture occupation decreased. (Jaganathan and Nagaraja 2015). The education level of respondents showed that 45 per cent of farmers are illiterate and only 12.5 per cent of farmers studied up to secondary level. The 32 per cent of farmers have primary level of education on the other hand, only 12 per cent completed the graduation. The education contributes much for gaining knowledge (Jaganathan and Nagaraja, 2015) thus the lower knowledge levels are noticed. The annual income of the majority of farmers is in medium income group (47 %), whereas 19 per cent respondents fall under low income group, on the other hand 34 per cent are under higher income level. As the vegetable cultivation contributes around 50% of annual income of the farmers as paddy (sole crop during *Kharif*) grown is purely for own consumption and grain quality is not suitable for export, thus contribution towards family income is very less. Thus it is envisaged from the table 1 that vegetable cultivation contributes significantly (47%) to farmers in their annual income (table -1) and the farmers are solely dependent on vegetable cultivation during *Rabi*-summer season for their family income.

Table 1: Socio economic profile of vegetable Growers.

Profile Characters	Classification	Respondents(N=120)	
		Frequency	%
Age	Young (less than 30 years)	24	20.00
	Middle (31-55 years)	66	55.00
	Old (more than 56 years)	30	25.00
Education level	Illiterate	54	45.00
	Primary	39	32.50
	Secondary	15	12.50
	Graduate and above	12	10.00
Annual income	Low income (Up to Rs 50,000)	23	19.16
	Medium income (Rs 50,001-Rs 1,00,000)	56	46.66
	High income (more than Rs1,00,001)	41	34.16
Income from Vegetable Cultivation	Low income (Up to Rs 25,000)	19	15.83
	Medium income (Rs 25,001-Rs 50,000)	59	49.16

Better crop yields can be obtained through adoption of latest scientific technologies and good crop production practices. As shown in table 2, the knowledge level of respondents in 26 parameters were analyzed. Majority of farmers possess medium knowledge about seasonal requirement (51%) and suitable soil requirement for the crop (48%) and many farmers possess good knowledge on these aspects as this was practiced by them over a long period, similar findings reported by Sundar Barman *et al.* 2015. For a successful crop, variety and seed quality plays a vital role. The study showed that 62 per cent are not having sufficient knowledge about availability of pest and disease resistance varieties/ hybrids, which is very much essential to minimize the crop loss as well as reduces the cost of production through minimizing the plant protection chemicals requirement and in achieving desired yields and income. This may be due to non availability of good quality seeds and awareness of the farmers in the Island as the farmers are still dependent on agricultural department for the supply of seeds and the private sector sellers are very less. The majority of farmers possess fair knowledge about seed quality (51.66%), seed rate (60%), seed cost (56.66 %), nursery management (50.83%), spacing (59.16%) and land preparation (53.33%) aspects. These techniques have been standardized long back and the farmers have well adopted these practices, similar results was found by Sharma, 2002 in a study on adoption of capsicum cultivation

practices. In order to achieve higher productivity, precision farming techniques like drip irrigation, mulching and fertigation are to be adopted in vegetable cultivation as practiced by the farmers of mainland. It was found that 88 percent of respondents do not have any knowledge/ awareness about these practices, thus it was noticed that the average productivity is far below the mainland growers.

It was observed from the study that major group of farmers were well aware of practices like manure (FYM) application (50%), fertilizer application (56.66 %). On the other hand only 30 % possess good knowledge about the use of micronutrient/ bio-fertilizers. The full potential of any crop can be achieved through proper nutrition. The reason may be lack of knowledge, non availability and high costs (Matouleibi *et al.*, 2014) thus the farmers failed to achieve desired productivity levels due to improper nutrition management as the vegetable crop yields are highly responsive to micronutrient application. Good number of respondents possess enough knowledge on irrigation management. On the other hand 87.5 per cent of farmers practice only manual weeding and no mechanical weeder/weedicides are employed in the production process thus the cost of production increased which resulted in lowering net returns. Similar findings were reported by Sundar Barman *et al.* (2015).

The plant protection management plays a vital role for achieving desired yield levels. The knowledge level on these practices like identification of pest and diseases showed fair level knowledge (50.8%) and 31.66 per cent does not have any knowledge. Further the knowledge in use of pesticides/fungicides are also poor (39.16 % no knowledge). The farmers use the available one or as given by pesticide dealers thereby they incur monetary loss as well as yield loss. As shown in Fig. 1 majority of farmers are still approaching pesticides dealers for their control of pests and only few will approach Agricultural department/KVK. It is good to note that 47.5 per cent farmers are aware about waiting period on the other hand 36.66 percent farmers were not aware about biological method of control of Pests and diseases. This may be due to non availability of plant protection chemicals and awareness of the farmers in the Island as the farmers are still dependent on agricultural department for the supply of pesticides and the private sector pesticide dealers are very less.

In order to reap better returns in vegetable production farmer's knowledge about marketing and post-harvest management are very important. The study showed that 56.66 per cent farmers very well knew about when to harvest their produce (harvesting Index), on the other

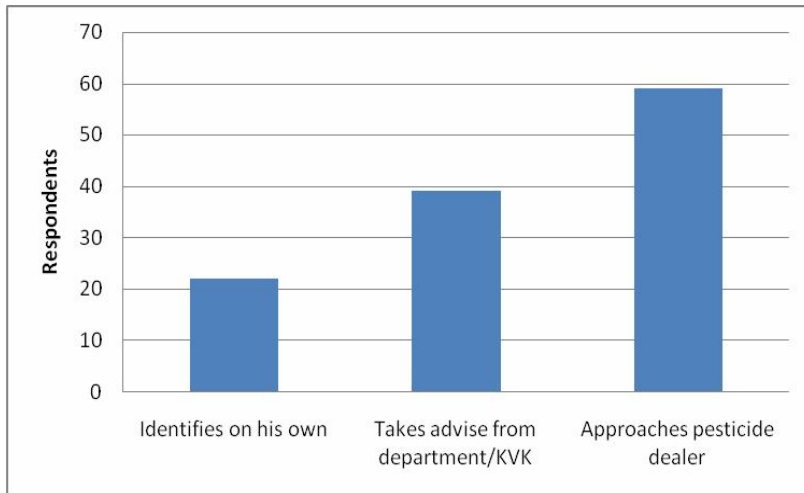


Fig. 1: Knowledge level of respondents in plant protection

Table 2 : Knowledge level of respondents about basic agricultural practices.

Sl. No	Cultivation Practices	Level of Knowledge					
		No knowledge		Less knowledge		Good knowledge	
		Frequ-ency	%	Frequ-ency	%	Frequ-ency	%
1	Seasons	12	10.00	62	51.66	46	38.33
2	Soil type	14	11.66	58	48.33	48	40.00
3	Varieties	38	31.66	63	52.50	19	15.83
4	Resistant varieties	74	61.66	32	26.66	14	11.66
5	Seed quality	47	39.16	62	51.66	11	9.16
6	Seed rate	34	28.33	72	60.00	14	11.66
7	Seed Cost	22	18.33	68	56.66	30	25.00
8	Nursery management	24	20	61	50.83	35	29.16
9	Spacing	12	10	71	59.16	37	30.83
10	Land preparation	18	15	64	53.33	38	31.66
11	precision farming	106	88.33	14	11.66	0	0
12	FYM application	9	7.50	60	50.00	51	42.5
13	Fertiliser application	11	9.16	68	56.66	41	34.16
14	Bio fertiliser/ Micronutrient	37	30.83	47	39.16	36	30.00
15	Irrigation management	26	21.66	48	40.00	46	38.33
16	Mechanical weeding	105	87.5	9	7.50	6	5.00
17	Pest and diseases	38	31.66	61	50.83	21	17.50
18	Pesticides'	47	39.16	49	40.83	24	20
19	Waiting period	38	31.66	57	47.50	25	20.83
20	Biological control	42	35.00	54	45.00	24	20.00
21	Organic bio-control	44	36.66	56	46.66	20	16.66
22	Harvesting index	21	17.50	68	56.66	31	25.83
23	Post harvest Handling	44	36.66	62	51.66	14	11.66
24	Grading	66	55.00	46	38.33	8	6.66
25	Marketing	7	5.83	56	46.66	57	47.50
26	Marketing Cost	68	56.66	33	27.50	19	15.83
	Average	38.61	32.17	53.88	44.90	27.50	22.91

hand only 11.66% respondent possess good knowledge about post harvest handling i.e. about grading, packaging etc. It was found that 55 per cent are not grading their produce. Further it was noticed that 46.66 per cent respondents possess less knowledge about marketing of their produce. On the other hand, 56 per cent of farmers are not aware of hidden market costs. Majority them are bringing their produce in gunny bags (no use of crates). This leads to damage, results in poor quality of produce which ultimately attribute to lower rates at the local markets (table-2). Due to lack of proper transportation facilities in the island they have been forced to sell their produce in local markets only at lower prices. Similar findings were reported by Matouleibi Chanu et al., (2014).

The adoption behavior is influenced by many factors like their social networks, personal circumstances, education and economic situations (Singh et al., 2011). Thus, from the table 3 it can be observed that 46 per cent of respondents possess medium level of knowledge. Only 22.5 per cent possess good knowledge and on the other hand 31.61 per cent of farmers have poor knowledge about latest technologies/ skills in vegetable cultivation. This may be mainly due to lower socio-economic status

Table 3: Overall classification of knowledge level of respondents towards agricultural practices

Knowledge level of respondents	Classification	
	Frequency	%
No knowledge	38	31.66
Less Knowledge	55	45.83
Good knowledge	27	22.50
Total	120	100.00

Table 4: Correlation of socio economic status with knowledge level of respondents

Socio economic parameter	Knowledge Correlation coefficient "r"
Age	0.861306*
Education	0.358404*
Annual income	0.55989*
Income from Vegetable	0.531444*

*significant at 1% level of significance using t test

of the farmers. Rogers (2003), found that farmers adoption is a social process. Thus there is a need to increase the level of knowledge through awareness training/ demonstrations in order to achieve the desirable yield levels in vegetable cultivation, which contributes significantly towards in farmer's income.

The knowledge level of respondents in different dimensions of vegetable cultivation practices were correlated with their socio-economic parameters like age, education and annual income as given in table 4. The result indicated that level of respondents increased with the increase in their education and annual income. It can be ascertained that educated farmers are more motivated towards learning new innovations in farming. Similar observation was by Sundar Barman *et al.*, (2015). Further, their increased annual income made affordable to invest more capital in vegetable cultivation which in turn helped the farmers to achieve higher productivity and returns on a sustainable basis. Shaileshkumar *et al.*, (2012) observed similar results in their study on knowledge level of hill farmers in agricultural practices. Similar studies by different researchers (Subhashini and Tyagarajan, 2000, Singh *et al.*, (2002), Vaish *et al.*, Singh *et al.*, (2003) have also observed that socio-economic status of farmers plays a vital role in adoption behavior. Thus, it can be observed from the study that age, education and farming income influence much on motivation for learning and adoption level of farmers.

Conclusion

The study clearly showed that majority of farmers possesses medium level of knowledge in vegetable cultivation practices. It was also observed that their level of knowledge about the varieties/hybrids seeds resistant to pest and disease is less. They do not possess adequate knowledge on the integrated nutrient and pest management. Majority farmers do not have knowledge on precision farming techniques. All these practices play a vital role in achieving the desired yield levels besides reducing the cost of production. Owing to these reasons, the average productivity and annual income are low among the Island farmers. Further the annual income of Island farmers is low, which had also contributed in adoption of new technologies by the farmers and non availability of quality inputs as in main land is also a constraint for Island farmers. In order to increase the productivity, effort should be made by the extension institutions in motivating and educating the farmers through mass media, capacity building programmes and demonstrations, this may help the farmers to learn and adopt the new innovations which intern help in achieving desirable changes in their knowledge and adoption levels for achieving optimum

yields and income on sustainable basis.

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