

**A STUDY ON IMPACT OF NATIONAL
HORTICULTURE MISSION ON SOCIO-ECONOMIC
STATUS OF TURMERIC GROWERS OF
CHHATTISGARH PLAINS**

Ph.D. Thesis

by

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**DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE, RAIPUR
FACULTY OF AGRICULTURE
INDIRA GANDHI KRISHI VISHWAVDYALYA
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HORTICULTURE MISSION ON SOCIO-ECONOMIC
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Thesis

Submitted to the

Indira Gandhi KrishiVishwavidyalya, Raipur

by

Yuvaraj Singh Dhruw

**IN PARTIAL FULFILMENT OF THE REQUIREMENTS
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in

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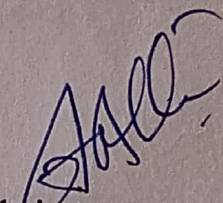
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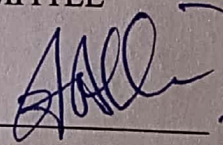
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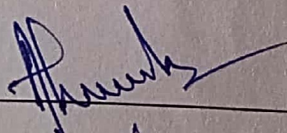
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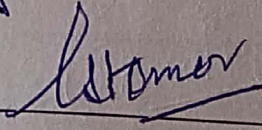
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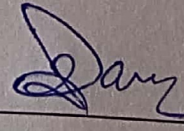
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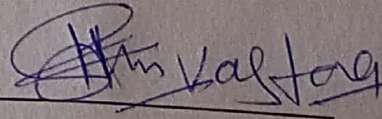
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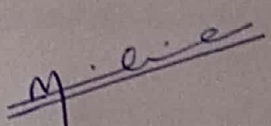
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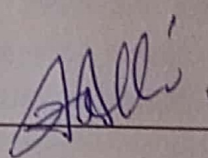
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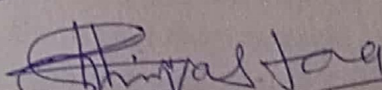
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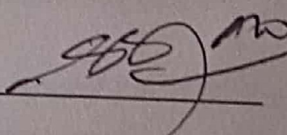
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YUVARAJ SINGH DHRUW

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LIST OF ABBREVIATIONS

%	Per cent
/	Per
<i>et al.</i>	And others
F	Frequency
Fig.	Figure
FYM	Farm Yard Manure
Ha	Hectare
HDO	Horticulture Development Officer
HRD	Human Resource Development
i.e.	That is
K	Potash
kg	Kilogram
KVK	KrishiVigyan Kendra
MPS	Mean Percent Score
N	Nitrogen
NHM	National Horticulture Mission
P	Phosphorous
q	Quintal
RHEO	Rural Horticulture Extension Officer
SD	Standard Deviation
SHDO	Senior Horticulture Development Officer
Sl. No.	Serial Number
T.V.	Television
Viz.	(Videlicet) Namely

THESIS ABSTRACT

- (a) **Title of the thesis:** A Study on Impact of National Horticulture Mission on Socio-economic Status of Turmeric Growers of Chhattisgarh Plains
- (b) **Full name of the student** Yuvaraj Singh Dhruw
- (c) **Major Subject** Agricultural Extension
- (d) **Name and address of the Major advisor** Dr. H.K. Awasthi, Professor, Department of Agricultural Extension, IGKV, Raipur (C.G.) 492012
- (e) **Degree awarded:** Ph. D. in Agriculture (Agricultural Extension)

Signature of the student

Signature of Major Advisor

Date:

Signature of Head of the Department

ABSTRACT

The present study was conducted during the years 2015-16 and 2016-17 in Chhattisgarh Plains. This study aims to assess the socio-economic status of the turmeric growers.

An *Ex-post-facto* research design was used in the present investigation. The state comprises 27 districts and the NHM scheme has been implemented in 19 districts, out of which 5 districts were selected purposively on the basis of maximum area and maximum number of turmeric growers. From each selected districts, 2 blocks were selected purposively on the basis of maximum area and maximum number of turmeric growers. From each selected block, 4 villages were selected purposively on the basis of maximum area and maximum number of turmeric growers.

A comprehensive list of beneficiaries respondents was collected from the Horticulture Department. In order to reach required sample size of 160 beneficiaries respondents, proportionate randomly method were used and equal numbers of non-beneficiaries

respondents were also selected randomly from same villages. In this way, a total of 320 farmers were considered as respondents to respond as per the interview schedule design for the study.

Majority of the beneficiaries respondents were middle aged, with middle school education, belonged to other backward class, large family size, joint family, involved in one organization of social participation, medium farming experience, mixed type house, engaged in labour, small farmer, occupied *Vertisols* type of land, having tube well, possessed one or two bullock, annual income (₹ 1,00,001 to 2,00,000), credit acquired from co-operative society, medium level of material possession, seed available from NHM office, seed storage in ventilated room, naturally dry in sunlight, medium level of extension contact, medium level of mass media exposure, medium level of scientific orientation, medium level of risk orientation, medium cosmopolitaness, medium level of achievement motivation, medium level of economic motivation, medium level of awareness, favourable attitude towards NHM, medium level of knowledge and medium level of adoption, medium size of area, medium level of productivity and belonged to middle class of socio-economic status.

Independent variables like education, social participation, house type, land holding, farm power, annual income, credit acquisition, material possession, cosmopolitaness and knowledge level had positive and highly significant association with socio-economic status of the beneficiaries respondents, while, occupation, irrigation, extension contact, scientific orientation, risk orientation and adoption had positive and significant association with socio-economic status of the beneficiaries respondents, which means that an increase in variable value results in an increase the impact of socio-economic status of the beneficiaries respondents, while variables viz., caste, family size, family type, experience, soil type, seed source, mass media exposure, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with impact of socio-economic status of the beneficiaries respondents. Variables like age, storage and processing and value addition had a negative and non-significant correlation with impact of socio-economic status of the beneficiaries respondents.

Independent variables viz., education, land holding, soil type, irrigation, annual income, mass media exposure, risk orientation, knowledge level and adoption level had a positive and highly significant correlation with productivity of turmeric, while variables farm power, extension contact and scientific orientation had a positive and significant correlation with productivity of turmeric, which means that an increase in variable value results in an increase the productivity of turmeric, while variables like age, social participation,

experience, house type, credit acquisition, material possession, seed source, storage, processing and value addition, cosmopolitaness, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with productivity of turmeric. Variables like caste, family size, family type and occupation had a negative and non-significant correlation with productivity of turmeric.

The results of regression analysis shows that out of 30 variables education, caste, social participation, occupation, house type, farm power, annual income, material possession, and economic motivation contributed highly significantly at 0.01 level of probability and family size, annual income, and mass media contributed significant at 0.05 level of probability towards socio-economic status of the respondents. Remaining variables could not influence the socio-economic status of the respondents.

In case of non-beneficiaries respondents, majority of the respondents were middle aged, educated up to primary school, belonged to other backward castes, with medium family size, having nuclear family, involved in one organization of social participation, medium farming experience, mixed type house, engaged in labour, semi-medium land sized farmers, occupied *Inceptisols* type of land, no irrigation sources, possessed one or two bullock, annual income (₹ 1,00,000 to 2,00,000), credit acquired from co-operative society, medium level of material possession, own seed source, seed storages in ventilated room, naturally dry in sunlight, medium level of extension contact, mass media exposure, risk orientation, cosmopolitaness, achievement motivation, economic motivation, awareness, favourable attitude towards NHM, medium level of knowledge, adoption and having medium size of area, low level of productivity and lower middle class socio-economic status.

Independent variables viz., education, social participation, house type, occupation, land holding, annual income, credit acquisition, farm power, material possession, cosmopolitaness and knowledge level had a positive and highly significant correlation with impact of socio-economic status of the beneficiaries respondents, while the variables like soil type, mass media exposure, risk orientation and adoption level had a positive and significant correlation with impact of socio-economic status of the non-beneficiaries respondents, which means that an increase in variable value results in an increase in the impact of socio-economic status of the non-beneficiaries respondents, while variables caste, family size, family type, irrigation, seed source, processing and value addition, extension contact, scientific orientation, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with impact of socio-economic status of the beneficiaries respondents. Variables like age, experience and storage had a negative and non-

significant correlation with impact of socio-economic status of the non-beneficiaries respondents.

Independent variables viz., land holding, irrigation, credit acquisition, scientific orientation, risk orientation, knowledge level and adoption level had positive and highly significant correlation with productivity of turmeric, while, education, social participation, soil type and material possession had positive and significant correlation with productivity of turmeric, which means that an increase in variable value results in an increase the productivity of turmeric, while variables like caste, experience, house type, farm power, annual income, seed source, storage, processing and value addition, extension contact, mass media exposure, cosmopolitaness, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with productivity of turmeric. Variables such as age, family size, family type and occupation had a negative and non-significant correlation with productivity of turmeric.

The results of regression analysis shows that out of 30 variables education, caste, house type, occupation, farm power, material possession and mass media exposure contributed highly significant at 0.01 level of probability and family size, social participation and annual income contributed significant at 0.05 level of probability towards socio-economic status of the respondents. Remaining variables could not influence the socio-economic status of the respondents.

The major constraints faced by the respondents were unavailability of processing unit, followed by high cost of manure and fertilizers and high cost of seed rhizomes.

The suggestions given by the respondents were assured selling prices of turmeric, followed by processing unit should be available and seed material should be available in low price.

शोध सारांश

अ. शोध का शीर्षक	छत्तीसगढ़ के मैदानी क्षेत्रों के हल्दी उत्पादक कृषकों की सामाजिक-आर्थिक स्थिति पर राष्ट्रीय बागवानी मिशन के प्रभाव पर एक अध्ययन
ब. छात्र का पूरा नाम	युवराज सिंह ध्रुव
स. सलाहकार का पूरा नाम एवं पूरा पता	डॉ. एच. के. अवस्थी, कृषि विस्तार विभाग, कृषि महाविद्यालय, इं. गां. कृ. वि. वि., रायपुर (छ.ग.)
द. उपाधि	कृषि (कृषि विस्तार) में पीएच. डी.
मुख्य सलाहकार का हस्ताक्षर	छात्र का हस्ताक्षर
दिनांक:	विभागाध्यक्ष का हस्ताक्षर

सारांश

वर्तमान अध्ययन छत्तीसगढ़ मैदानों में वर्ष 2015-16 और 2016-17 के दौरान आयोजित किया गया था । इस अध्ययन का उद्देश्य हल्दी उत्पादकों की सामाजिक-आर्थिक स्थिति का आकलन करना है ।

वर्तमान जांच में घटना घटित होने के बाद के शोध डिजाइन का उपयोग किया गया । छत्तीसगढ़ राज्य में 27 जिले हैं और एनएचएम योजना 19 जिलों में संचालित है, जिनमें से, 5 जिलों को हल्दी उत्पादकों की अधिकतम संख्या के आधार पर जानबूझकर चुना गया था । प्रत्येक चयनित जिलों से, 2 ब्लॉक जानबूझकर चुने गए थे जहां हल्दी उत्पादकों की अधिकतम संख्या के आधार पर चुना गया था । प्रत्येक चयनित ब्लॉक से, 4 गांवों को हल्दी उत्पादकों की अधिकतम संख्या के आधार पर जानबूझकर चुना गया था ।

लाभार्थियों के उत्तरदाताओं की एक व्यापक सूची बागवानी विभाग से एकत्र की गई थी । पहुंच के लिए 160 लाभार्थियों के उत्तरदाताओं के नमूना तैयार किया गया, जिसमें अनुपातिक विधि का उपयोग किया गया था और गैर-लाभार्थियों को भी बराबर संख्या में उत्तरदाताओं के रूप में उसी गांव से यादृच्छिक रूप से चुना गया था । इस तरह, अध्ययन के लिए साक्षात्कार अनुसूची डिजाइन के अनुसार कुल 320 किसानों को जवाब देने के लिए उत्तरदाताओं के रूप में चुना गया था ।

लाभार्थियों के अधिकतर उत्तरदाता मध्यम आयु वर्ग के थे, माध्यमिक शिक्षा के साथ, अन्य पिछड़ा वर्ग, बड़े परिवार के आकार, संचुक्त परिवार, एक ही संगठन में शामिल थे, मध्यम खेती का अनुभव, मिश्रित प्रकार का घर, श्रम कार्य में जुड़े, छोटे किसान, कन्हार प्रकार की मिट्टी में खेती, ट्यूबवेल के साधन, एक या दो बैल, वार्षिक आय ₹ 1,00,000 से 2,00,000 सहकारी समिति से प्राप्त ऋण, सामाग्री का मध्यम स्तर, एन एच एम कार्यालय से उपलब्ध बीज, हवादान कमरे में बीज का भंडारण, सूरज की रोशनी से स्वाभाविक रूप से सूखाया गया, मध्यम स्तर का विस्तार संपर्क, मध्यम माध्यम का एकसपोजर, वैज्ञानिक अभिविन्यास का मध्यम स्तर, जोखिम अभिविन्यास का मध्यम स्तर, मध्यम विश्वव्यापीता, उपलब्धि प्रेरणा का मध्यम

स्तर, आर्थिक प्रेरणा का मध्यम स्तर, जागरूकता का मध्यम स्तर, एनएचएम की दिशा में अनुकूल दृष्टिकोण, ज्ञान का मध्यम स्तर और अंगीकरण का मध्यम स्तर, सामाजिक-आर्थिक स्थिति का मध्यम स्तर,, उत्पादकता का मध्यम स्तर, और मध्यम आकार का क्षेत्र था।

स्वतंत्र चर जैसे- शिक्षा, सामाजिक भागीदारी, घर के प्रकार, भूमि अधिग्रहण, कृषि शक्ति, वार्षिक आय, क्रेडिट अधिग्रहण, संसाधनों, विश्वव्यापीता और ज्ञान स्तर पर लाभार्थियों के उत्तरदाताओं की सामाजिक-आर्थिक स्थिति के साथ सकारात्मक और अत्यधिक महत्वपूर्ण सहयोग था, जबकि व्यवसाय, सिंचाई, विस्तार संपर्क, वैज्ञानिक अभिविन्यास, जोखिम अभिविन्यास और अंगीकरण लिए लाभार्थियों के उत्तरदाताओं की सामाजिक-आर्थिक स्थिति के साथ सकारात्मक और महत्वपूर्ण सहयोग था, जिसका अर्थ है कि परिवर्तनीय मूल्य परिणामों में वृद्धि से सामाजिक आर्थिक स्थिति के प्रभाव में वृद्धि हुई है। जबकि चर जैसे जाति, परिवार का आकार, परिवार का प्रकार, अनुभव, मिट्टी के प्रकार, बीज स्रोत, जन मीडिया एक्सपोजर, उपलब्धि प्रेरण, आर्थिक प्रेरणा, जागरूकता और दृष्टिकोण के साथ सामाजिक-आर्थिक स्थिति के प्रभाव के साथ सकारात्मक और गैर-महत्वपूर्ण सहसंबंध था। दूसरे जैसे चर आयु, भंडारण और प्रसंस्करण और मूल्यवर्धन के लाभार्थियों के उत्तरदाताओं की सामाजिक-आर्थिक स्थिति के प्रभाव के साथ नकारात्मक और गैर-महत्वपूर्ण सहसंबंध था।

स्वतंत्र चर जैसे शिक्षा, भूमि अधिग्रहण, मिट्टी के प्रकार, सिंचाई, वार्षिक आय, मास मीडिया एक्सपोजर, जोखिम अभिविन्यास, ज्ञान स्तर और अंगीकरण के स्तर में हल्दी की उत्पादकता के साथ सकारात्मक और अत्यधिक महत्वपूर्ण सहसंबंध था, जबकि कृषि फार्म, विस्तार संपर्क और वैज्ञानिक अभिविन्यास में हल्दी की उत्पादकता के साथ सकारात्मक और महत्वपूर्ण सहसंबंध था, जिसका अर्थ है कि चर मूल्य में वृद्धि होने से हल्दी की उत्पादकता में वृद्धि हुई है, जबकि आयु, सामाजिक भागीदारी, अनुभव, घर का प्रकार, क्रेडिट अधिग्रहण, संसाधनों, बीज स्रोत, भंडारण, प्रसंस्करण और मूल्यवर्धन, विश्वव्यापीता, उपलब्धि प्रेरणा, आर्थिक प्रेरणा, जागरूकता और दृष्टिकोण में हल्दी की उत्पादकता के साथ सकारात्मक और गैर-महत्वपूर्ण सह संबंध था। चर जैसे जाति, परिवार के आकार, परिवार का प्रकार और व्यवसाय हल्दी की उत्पादकता के साथ नकारात्मक और गैर-महत्वपूर्ण सहसंबंध था।

रिग्रेशन विश्लेषण के नतीजे बताते हैं कि 30 चरों में से शिक्षा, जाति घर के प्रकार, व्यवसाय, कृषि शक्ति, संसाधनों, और मध्यम स्तर का आर्थिक प्रेरणा में 0.01 प्रतिशत की संभावना और परिवार के आकार वार्षिक आय और मास मीडिया एक्सपोजर में 0.05 प्रतिशत की संभावना उत्तरदाताओं की सामाजिक-आर्थिक स्थिति पर महत्वपूर्ण योगदान दिया।

गैर-लाभार्थियों के मामले में उत्तरदाताओं का बहुमत मध्यम आयु वर्ग था, जो प्राथमिक विद्यालय तक शिक्षित थे, अन्य पिछड़े जातियों के थे, मध्यम परिवार के आकर के साथ, अकेला परिवार, एक ही संगठन में शामिल थे, मध्यम कृषि का अनुभव, मिश्रित प्रकार घर, श्रम अर्ध मध्यम किसानों, मटासी प्रकार की मिट्टी थे, कोई सिंचाई स्रोत नहीं, एक या दो बैल, वार्षिक आय (₹ 1,00,000 से 2,00,000), सहकारी समिति से प्राप्त ऋण, संसाधनों के मध्यम स्तर, स्वयं का बीज स्रोत, हवादार कमरे में बीज भंडार, स्वाभाविक रूप से सूरज की रोशनी में सूखाना, विस्तार का मध्यम स्तर, मास मीडिया एक्सपोजर का मध्यम स्तर, जोखिम अभिविन्यास का मध्यम स्तर, मध्यम विश्वव्यापीता, उपलब्धि प्रेरणा का मध्यम स्तर, आर्थिक प्रेरणा का मध्यम स्तर, जागरूकता का मध्यम स्तर, एनएचएम की ओर अनुकूल दृष्टिकोण, ज्ञान का मध्यम स्तर, अंगीकरण का मध्यम स्तर, सामाजिक-आर्थिक स्थिति का निम्न मध्यम स्तर, उत्पादकता का निम्न स्तर और मध्यम आकार का क्षेत्र था।

स्वतंत्र चर जैसे शिक्षा, सामाजिक भागीदारी, घर का प्रकार, व्यवसाय, भूमि अधिग्रहण, वार्षिक आय, क्रेडिट अधिग्रहण, कृषि शक्ति, संसाधनों, विश्वव्यापीता और ज्ञान स्तर की सामाजिक-आर्थिक स्थिति के प्रभाव सकारात्मक और अत्यधिक महत्वपूर्ण से संबंधित थे। जबकि चर मिट्टी के प्रकार, मास मीडिया एक्सपोजर, जोखिम अभिविन्यास और

अंगीकरण स्तर में गैर-लाभार्थियों के उत्तरदाताओं की सामाजिक-आर्थिक स्थिति के प्रभाव के साथ सकारात्मक और महत्वपूर्ण सहसंबंध था, जिसका अर्थ है कि चर मूल्य में वृद्धि हुई है, जबकि जाति, परिवार का आकार, परिवार का प्रकार, सिंचाई, बीज स्रोत, प्रसंस्करण और मूल्यवर्धन, विस्तार संपर्क, वैज्ञानिक अभिविन्यास, उपलब्धि प्रेरणा, आर्थिक प्रेरणा, जागरूकता और दृष्टिकोण का सामाजिक-आर्थिक स्थिति के प्रभाव के साथ सकारात्मक और गैर-महत्वपूर्ण सहसंबंध था । अन्य चर जैसे आयु, अनुभव और भंडारण गैर-लाभार्थियों के उत्तरदाताओं की सामाजिक-आर्थिक स्थिति के प्रभाव के साथ नकारात्मक और गैर-महत्वपूर्ण सहसंबंध था ।

स्वतंत्र चर जैसे भूमि अधिग्रहण, सिंचाई, क्रेडिट अधिग्रहण, वैज्ञानिक अभिविन्यास, जोखिम अभिविन्यास, ज्ञान स्तर और अंगीकरण के स्तर में हल्दी की उत्पादकता के साथ सकारात्मक और अत्यधिक महत्वपूर्ण सहसंबंध था जबकि शिक्षा, सामाजिक भागीदारी, मिट्टी के प्रकार और संसाधनों का हल्दी की उत्पादकता के साथ सकारात्मक और महत्वपूर्ण सहसंबंध है, जिसका अर्थ है कि चर मूल्य में वृद्धि होने से हल्दी की उत्पादकता में वृद्धि हुई है, जबकि चर जैसे जाति, अनुभव, घर का प्रकार, कृषि शक्ति, वार्षिक आय, बीज स्रोत, भंडारण, प्रसंस्करण और मूल्यवर्धन, विस्तार संपर्क, मास मीडिया एक्सपोजर, विश्वव्यापीता, उपलब्धि प्रेरणा, आर्थिक प्रेरणा, जागरूकता और रवैया हल्दी की उत्पादकता के साथ एक सकारात्मक और गैर-महत्वपूर्ण सहसंबंध था । अन्य चर जैसे आयु परिवार के आकार, परिवार का प्रकार और व्यवसाय हल्दी की उत्पादकता के साथ नकारात्मक और गैर-महत्वपूर्ण सहसंबंध था ।

रिग्रेशन विश्लेषण के नतीजे बताते हैं कि 30 चरों में से शिक्षा, जाति, घर का प्रकार, व्यवसाय, कृषि शक्ति, संसाधनों और मास मीडिया एक्सपोजर में 0.01 प्रतिशत की संभावना और का बहुत महत्वपूर्ण योगदान था, परिवार के आकार, सामाजिक भागीदारी और वार्षिक आय में उत्तरदाताओं की सामाजिक-आर्थिक स्थिति में 0.05 प्रतिशत स्तर की संभावना पर महत्वपूर्ण योगदान था । शेष चर उत्तरदाताओं की सामाजिक-आर्थिक स्थिति को प्रभावित नहीं कर सके ।

उत्तरदाताओं द्वारा सामना की जाने वाली प्रमुख बाधाओं में प्रसंस्करण इकाई की अनुपलब्धता के बाद, खाद और उर्वरकों की अधिक लागत और बीज सामग्री की अधिक लागत ।

उत्तरदाताओं द्वारा प्रदान किए गये सुझाव में हल्दी की बिक्री में उचित कीमत के बाद, प्रसंस्करण इकाई उपलब्ध होना चाहिए और बीज सामग्री कम कीमत में उपलब्ध होनी चाहिए ।

CHAPTER-I

INTRODUCTION

Agriculture is livelihood for about 70.00 per cent of the Indian population. It plays a pivotal role in respect of socio-economic status of people in general and rural people in particular. Dry land agricultural production in India is dominated and has the stigma of low productivity. Our farming is still subjected to the natural calamities coupled with uncertainties leading to variations in a crop yield. However, India has 54.7 per cent of cultivable land and varied climates. With sunshine round the year it is the world's best country to grow crops round the year. The area under irrigation is about 33.00 per cent of the net area sown. While 67 per cent of total net cultivated area (136.8 m ha) comes under rainfed lands spread over 177 districts. Rainfed crops account for 48 per cent area under food crops and out of it 68 per cent of the area under non-food crops. Thus, India has a great scope and potential in the production of horticultural crops, which includes fruits, vegetable, spices, floriculture and plantations. Area under horticulture is around 20 million hectares. The recent emphasis on horticulture in our country consequent to the recognition of the need for attaining nutrition security and for more profitable land use brought about a significant change in the outlook of the growers (Gulkari, 2011).

Horticulture sector account for 30 per cent of India's agricultural GDP from 8.5 per cent cropped area. It has over the years, emerged as a growth engine of agriculture, making a significant contribution to agricultural GDP. Diversified and accelerated agricultural growth is critically dependent upon the development of horticulture sector. It plays a vital role in improving the productivity of land, generating employment ameliorating the economic condition of farmers and entrepreneurs and enhancing exports. India's horticulture sector is fascinatingly diversified and covers a wide range of fruits, vegetables, tuber crops, flowers, mushroom, spices, medicinal and aromatic plants and variety of plantation crops (Anonymous, 2010).

India produces a wide variety of fruits, vegetables, root and tuber crops, flowers, ornamental plants, medicinal and aromatic plants, spices, condiments, plantation crops and mushrooms. These crops form a significant part of total agricultural produce in the country. All horticulture crops put together covered nearly 23.7 million hectares area with an annual production of 268.8 million tonnes during 2012-13 (Anonymous, 2013). Though these crops occupy about 10.7 per cent of the gross cropped area, they contribute over 30 per cent to the agricultural Gross Domestic Product and 37 per cent of total export of agricultural commodities in the country. The area and production of horticultural crops have increased considerably as compared to the situation a couple of decades ago. The area under horticulture crops has increased from 16.3 million ha in 2002-03 to 23.7 million ha in 2012-13 with the corresponding increase in production from 144.4 million tonnes to 268.8 million tonnes. Thus, there has been an unparalleled increase in area and production during this period amounting to 45.3 and 86.1 per cent, respectively. So the horticulture sector is expected to play a major role in the overall development of agriculture in the country in the coming years. Furthermore, the Indian farmers are eager to find new avenues for diversifying their crops through interventions in horticulture. Horticulture plays an important role in livelihood security of poor farmers. It provides food security and perennial source of income to poorest of poor. It is a dynamic tool for ensuring ecological sustainability.

National Horticulture Mission (NHM) has been implemented in 2005-06 in 18 States and 3 Union Territories of India excluding the states covered under Horticulture Mission for North East and Himalayan States (HMNEH) to promote holistic growth of the horticulture sector covering fruits, vegetables, root and tuber crops, mushroom, spices, flowers, aromatic plants, cashew and cocoa. HMNEH is a separate Technology Mission restructured in 2002-03 for integrated development of horticulture in North Eastern States including Sikkim and the states of Himachal Pradesh, Jammu & Kashmir and Uttaranchal. During XI plan, the assistance from Government of India will be 85 per cent with 15 per cent contribution by the State Government.

The Missions objectives include steps to promote holistic growth of the horticulture sector through area based regionally differentiated strategies, to enhance horticulture production and to assure nutritional security and income support to farm households and others, to establish convergence and synergy among multiple on-going and planned programmes for horticulture development. Beside these, to generate employment for skilled and unskilled peoples, especially unemployed youth.

The Centrally Sponsored Scheme of National Horticulture Mission (NHM) is being implemented in 19 districts of Chhattisgarh state viz. Surguja, Raigarh, Korba, Bilaspur, Kabirdham, Durg, Jagdalpur, Raipur, Rajanandgaon, Jaspur, Korea, Balodabazar, Gariaganj, Baloda, Bemetre, Mungeli, Balrampur, Surajpur and Kodagaon.

Major activities being undertaken in the programme are production and distribution of planting material, vegetable seed production, area expansion, rejuvenation of old and senile orchards, creation of community water resources, protected cultivation, IPM/INM, organic farming, pollination support, development of post harvest management and marketing infrastructure and human resource development.

The focus crops identified under the programme include Mango, Cashew, Litchi, Patchouli, Jamrosa, Vetivera, Citriodora, Chrysanthemum, Marigold, Cycalyptus, Chillies, Garlic and Coriander. National Horticulture Mission in the Chhattisgarh state was effectively launched in the year 2006-07. Initially 7 districts out of the 21 districts have been included in the mission. The main focus had been on four major crops viz. Mango, Litchi, Cashew and Lime. Along with the main five crops namely Chilli, Ginger, Garlic, Coriander and Turmeric have been taken up essentially as inter crops. Later in the year 2007-08, four additional districts namely Raipur, Korea, Jashpur and Rajnandgaon were included in the action plan. In recent years, six new crops were included in the list of main crops, they were Jamun, Aonla, Ber, Bael, Sitaphal and Banana and crops such as Lemon grass, Patchouli, Khus, *E. citriodora*, Palmarosa, Jamarosa, Alovera, Sarpagandha, Ashwagandha and Bach have been selected as intercrop.

Turmeric is one of the important cash crops in India. India is the larger producer and exporter of turmeric in the world. Turmeric occupies about 6 per cent of the total area under spices and condiment products in India. In the year 2012-13, turmeric cultivation was 194 thousand ha with the production of 971 thousand tonnes. It reached to 233 thousand ha with the production of 1190 thousand tonnes in the year 2014-15 (Anonymous, 2015).

Chhattisgarh is also one of the important states of turmeric cultivation. In the Chhattisgarh state cultivated area of turmeric is about 11.021 thousands ha with production of 113.34 thousand tonnes (Anonymous, 2014). Looking to the sizeable area of turmeric in Chhattisgarh state the present investigation was carried out during the year 2015-16 and 2016-17 with following objectives.

OBJECTIVES

1. To study the socio-personal, socio-economic, communicational and socio-psychological profile of turmeric growers
2. To study the knowledge and adoption level of turmeric growers
3. To study the attitude of turmeric growers towards NHM
4. To identify the benefits received by the turmeric growers under NHM
5. To assess the impact of NHM on area, productivity and socio-economic status of turmeric growers
6. To determine the constraints and obtain the suggestions from turmeric growers regarding turmeric cultivation

NEED AND IMPORTANCE OF THE STUDY

The NHM has completed initial phase of its implementation in the Chhattisgarh state. Hence, its impact assessment in terms of outcomes and constraints would be useful for the policy makers. This study deals with some of these aspects and it is a departure from earlier literature in terms of its focus on issues related to horticultural crops at the macro as well as micro levels in the Chhattisgarh State. The main objective of this research is to know the status of farmers due to participation in the NHM programmes and knowledge of farmers about the package and practices of turmeric crops and its adoption along with the awareness of the Mission. Further, it seeks to highlight the status of horticultural

crops at the district and state levels. In addition, it is tried to assess the prospects of increasing the area and productivity of horticultural crops and income generation and assets created due to the implementation of the National Horticulture Mission.

SCOPE OF THE STUDY

Today horticultural crop gives remunerative return to the farmers and improve the socio-economic condition of the farmers. The present study which considers that due to the National Horticulture Mission there is change in socio-economic status of the farmers, who have joined mission during its initial stage. Their improved status may inspired to other farmers who have not still joined the mission.

The present study would be useful to the executors of various Agricultural Development Programme designed for upliftment of farmers. The present study was to make necessary change so as to make the mission totally successful.

LIMITATION OF THE STUDY

As it is true of any scientific investigation carried out by a student researcher, this study also had the following limitation.

1. The findings of the study were based on verbal expression of the respondents therefore the findings were conditioned by the extent of reliable and verbal information provided by the respondents selected farmers for the purpose of investigation.
2. Due to the limitation of time and other resources this study could not be taken up in a large area. It was confined to only five districts of Chhattisgarh plains.
3. In spite of the limitations, the findings of the study would provide a better insight indentifying the impact of National Horticulture Mission on socio-economic status of the farmers by the improvement of farmers in terms of increase of area and productivity under NHM in the study area.

CHAPTER-II

REVIEW OF LITERATURE

One of the important aspects of research is the review of past literature. The researchers have to review the concerning literature at every stage. It is not a one short exercise but a continuous process, while going through the literature the researcher gets acquainted with the subject matter, techniques and material and guides his effort in desirable direction. Through review, researcher comes to know about the methods, procedures and technique as well as results of past studies. It provides clues and guidance throughout the research process. Steady efforts were made to compile research findings of the research studies possessing more or less similar characteristics. The present chapter incorporates all the relevant literature developed in India and abroad related to turmeric cultivation by the farmers under following heads

A brief account of related studies has been furnished under the following heads:

- 2.1 Socio-personal characteristics
- 2.2 Socio-economic characteristics
- 2.3 Technological characteristics
- 2.4 Communicational characteristics
- 2.5 Psychological characteristics
- 2.6 Impact of NHM on Socio-economic status of turmeric growers
- 2.7 Impact of NHM on Productivity of turmeric
- 2.8 Constraints
- 2.9 Suggestions

2.1 Socio-personal characteristics

2.1.1 Age

Das and Puzari (2010) revealed that majority of the women (42%) were in the young age group of 25-35 years. Adoption and diffusion studies indicated that young

farmers exhibited more interest and were open to newer ideas and the predominance of younger age farm women in the present study supports the similar views.

Kumar *et al.* (2010) indicated that age of the respondents varied from 25 to 65 years. Most of the respondents (50%) belonged to the age group of 37 to 47 years, 27.50 per cent belonged to the age group of 25 to 37 years and the remaining 22.50 per cent respondents were in the age group of 47 to 65 years.

Poonia and Dhaka (2011) indicated that majority of the respondents (40.00%) belonged to middle age group, followed by young age (35.00%) and old age (25.00%) group.

Waghmare and Kadam (2011) indicated that majority of the respondents (50.84 %) were from young age group. While 37.50 per cent and 11.66 per cent were from middle and old age group, respectively.

Yadav *et al.* (2012) revealed that in GAP adopter group maximum growers (30%) were having the orchards in the age group of above 50 years. It was followed by 21 to 30 age group (25%), 31 to 40 group (22.50%), 41 to 50 age group (12.50%) and 10 to 20 age group (10%). Whereas, 10 per cent orchard of GAP non adopter group were above 50 years age, followed by 31 to 40 age group (30%), 41 to 50 age group (15%) and 10 to 20 age group (12.50%).

2.1.2 Education

Vishnugouda *et al.* (2011) observed that maximum respondents (35%) were high school passed. About 33 per cent of respondents were middle school passed, followed by college graduates (21%) and functionally literate (10%).

Fartyal and Rathore (2014) revealed that the maximum percentage (27.55%) of respondents had education up to middle level. Among them, 34.69 per cent were women followed by men (20.40%). It is important to note that about one fourth (24.49%) of respondents had high school level education which constituted 20.40 per cent of men and 28.57 per cent women. There were 18.37 per cent of respondents who had passed primary level education which constituted 12.24 per cent of men and 24.48 per cent women. It is also important to note that 14.28 per cent respondents had passed

intermediate education which constituted more than one fourth (26.04%) of men and only 2.04 per cent women. Overall only eleven farmers were illiterate; among them 16.32 per cent were women and 6.12 per cent men. There were only four men who were graduates.

Singh and Verma (2014) showed that majority of the beneficiaries are not able to attain high level of education. As such 33.00 per cent of the beneficiaries were having education up to primary school and illiterate were 28.00 per cent. Beneficiaries having education up to Junior high school and high school were 22.50 and 19.00 per cent, respectively. 15.50 per cent beneficiaries were having the education up to intermediate level. However, only 12.50 per cent beneficiaries were graduates. It can be derived from the above data that maximum number of beneficiaries belongs to poor educational background (Illiterate and Primary school).

Jana *et al.* (2016) revealed that most of respondents (73%) had up to primary level of education and at the lowest 5 per cent of respondents had graduate and above level of education. Other levels of education were secondary level (13%) and higher secondary level (9%).

Seemaprakalpa (2016) indicated that 88 per cent and 86 per cent women entrepreneur were illiterate. Fourteen per cent and twelve per cent were educated up to primary level. Hence, 87 per cent of women entrepreneurs were illiterate and 13 per cent were educated up to primary level. Similar findings are also observed in the earlier study conducted by Rao (1991).

2.1.3 Caste

Shukla and Sharma (2010) showed that majority of the respondents (52%) belonged to agricultural caste. The remaining 48 per cent of the respondents were from other castes. It showed that sericulture is more popular in agricultural castes, followed by scheduled tribe and scheduled castes as an auxiliary occupation.

Jobpaul and Rao (2011) revealed that highest percentage (28.89%) was recorded under marginal farmers category, followed by medium, small and large farmers. The highest percentage of farmers (33.88%), under other castes, recorded

under the category of large farmers followed by medium, marginal and small farmers. Similarly, under backward castes, medium farmers (32.54%) occupied first place followed by marginal farmers, large farmers and small farmers. Among the scheduled castes, the percentage of marginal farmers (36.89%) were more followed by small, medium and large farmers. In the scheduled tribe community, the small farmers (34.00%) percentage was the highest followed by marginal, medium and large farmers.

Reza and Arshad (2012) found that majority of the respondents among the small producers (35.73%) were scheduled caste, 25.33 per cent were schedule tribes, 16.80 per cent were general and 15.20 per cent OBC and 6.94 per cent were minority. It has been shown that vast majority of the small producers belonged to scheduled caste and followed by tribal community of Tripura. The rural poor have a direct relation with bamboo and their socio-economic development.

Gupta and Dey (2014) showed that majority of the respondents (54.50%) of Lumding were from scheduled castes followed by 7.20 per cent of other backward classes and 32.90 per cent were from general castes.

Mugadur and Hiremath (2014) showed that SC and ST households were 40.00 per cent and OBC were 33.33 per cent and others were 26.67 per cent. The majority group of households were belongs to SC/ST.

2.1.4 Family size

Andhari *et al.* (2010) revealed that 55.00 per cent of the respondents had family size between 5 to 7 members, followed by 37.33 per cent of the respondents had up to 4 members family size.

Patil *et al.* (2010) observed that more number of respondents (42.86%) belonged to small family size, followed by big (32.86%) and medium (24.29%) family size. The present situation of continuous fragmentation of family for self growth might have favoured results.

Deshmukh *et al.* (2011) indicated that majority of farmers (55.67%) had four to six members in their family, followed by 29.33 per cent had seven to ten members

and 8.17 per cent had one to three members. About 6.83 per cent had more than ten members in the family.

Badodiya *et al.* (2012) revealed that majority of the beneficiary respondents (52.67%) had medium size of family (5-8 members), followed by 29.33 per cent big (above 8 members) and 20.00 per cent of the beneficiaries respondents had small size of family.

Verma *et al.* (2014) observed that half (50.00%) of the Kherigarh farmers had medium size family, followed by large (30.00%) and small (20.00%) size family.

2.1.5 Family type

Shukla and Sharma (2010) showed that majority of the respondents (76%) were having nuclear family and the remaining 24 per cent of the respondents were having joint families.

Waghmare and Kadam (2011) revealed that 50.84 per cent respondents belonged to nuclear family system and 49.16 per cent respondent's belonged to joint family system.

Mohanraj and Karthikeyan (2012) found that almost all the beneficiaries (96.67%) were belonged to nuclear family and only 3.33 per cent of the beneficiaries had joint family.

Nand *et al.* (2012) indicated that most of the members having single or nuclear family were 47 per cent and joint family 53 per cent.

Seemaprakalpa and Mishra (2014) observed that majority of the respondents belonged to nuclear families (93.33%) and remaining belonged to joint families (6.67%).

2.1.6 Social participation

Vishnugouda *et al.* (2011) revealed that 46.25 per cent of respondents were having official position in one or more organizations and 23.75 per cent of them were involved in community work. About 30 per cent of pomegranate growers were having no official position in socio-political organization. Only 30.0 per cent of pomegranate growers were not involved in any socio political participation. It can be concluded that

socio-political participation of the respondents was very high. It means they can positively influence policies related to pomegranate cultivation and implementation of technologies.

Waghmare and Kadam (2011) indicated that majority of the respondents (57.50%) had participated in social organization to a medium extent, while 29.17 and 13.33 per cent of the respondents had participated in social organization to low and high extent, respectively.

Salunkhe *et al.* (2012) revealed that the nearly half of agro-service providers (45.00 %) and the majority of beneficiaries (55.00%) had membership in one organization, followed by 30.00 and 28.00 per cent of them had membership in more than one organization with position and 25.00 and 17.00 per cent of agro-service providers and beneficiaries hadn't any membership, respectively.

Patil *et al.* (2014) found that 31.00 per cent of the respondents were members of service co-operative society and 20.00 per cent and 11.00 per cent of the respondents were occasionally and regularly participate in the organization activities. The possible reason may be that, these organizations are functioning at the village level and most of them had taken loan from farmer's service co-operative society for various agricultural purposes. As a result, they might have participated in the activities. Majority of the respondents never participated in the activities of taluka panchayat and zilla panchayat. As these organizations exist at taluka and district level, respectively. Hence, majority of them might have felt inconvenient to attend the meetings as well as the participation is open for members only and hence the result.

Verma *et al.* (2014) revealed that more than half of the Kherigarh farmers (52.50%) were the members of one social organization, followed by no social participation (35.80%), membership in more than one organization (7.50%) and office bearers (4.20%).

2.1.7 Farming experience

Jaganathan *et al.* (2009) revealed that 47 per cent of the respondents had medium level of experience in vegetable cultivation, followed by 35 per cent high and 18 per cent of them low level of experience in vegetable cultivation.

Andhari *et al.* (2010) found that majority of the respondents (59.33%) were found to have 3 to 5 years of farming experience, whereas, 21.33 per cent were observed with more than 6 years of farming experience.

Poonia and Dhaka (2011) showed that 57.50 per cent of the respondents had medium (5-10 years) level of experience about vegetable cultivation, followed by 26.67 and 15.83 per cent of them had low and high experience, respectively.

Patil *et al.* (2014) observed that 64.00 per cent of the khol crop growers were cultivating khol crop from 8 years. Whereas, 19.00 per cent of the farmers belonging to 'up to 3 years experience' and 17 per cent of the farmers have 'more than 10 years of experience'.

Verma *et al.* (2014) found that majority of the Kherigarh farmers (38.33%) had medium experience, followed by high (32.50%) and low experience (29.16%) in rearing of Kherigarh breed.

Dhalpe and Dawane (2016) illustrated that about 76.67 per cent of respondents were having higher experience more than 20 years, followed by 15.83 per cent of them 10 to 20 years and 7.50 per cent were having up to 10 years experience.

2.1.8 House type

Singh *et al.* (2009) indicated that majority of the farmers (48.00%) had kachcha house, followed by 31.00 per cent had mixed and 21.00 per cent of the respondents had pucca house.

Shukla and Sharma (2010) showed that majority of the respondents (66%) had kuccha housing facility followed by 27 per cent respondents with pucca house. Only seven per cent of the respondents had mixed type of house.

Savita *et al.* (2011) observed that 100 per cent respondents were owned one house before implementation of the project. However, there was an increase from

‘zero’ per cent to 10.66 per cent of respondents owned two houses after implementation of Community Based Tank Management Project. The probable reason may be due to increased level of income after implementation of Community Based Tank Management Project might have motivated them to construct more number of houses.

Vishnugouda *et al.* (2011) found that almost 75 per cent of respondents were having concrete home, followed by 12.50 per cent with brick walled and thatched. Another 12.50 per cent of respondents were having concrete and double storied type of house. No shed thatched and mud walled thatched type of house was found. This clearly indicates average standard of respondents. This in totality indicates that most of them are with good resources.

Nand *et al.* (2012) observed that maximum number of members (50%) having kutcha mud house were predominant, followed by 40 per cent of them have mixed house and rest 10 per cent of them had pucca house.

2.2 Socio-economic characteristics

2.2.1 Occupation

Deshmukh *et al.* (2011) found that agriculture is the main occupation of most of the respondents (70%), followed by sheep rearing (18%) and daily wages labour (12 %).

Salunkhe *et al.* (2012) showed that about two fifth of agro-service providers (37.00 %) and nearly half of beneficiaries (48.00%) had farming + animal husbandry + business as their major occupations, followed by 34.00 and 16.00 per cent were having farming + animal husbandry + service and 29.00 and 36.00 per cent were having farming only by agro service provider and beneficiaries, respectively.

Mugadur and Hiremath (2014) showed that the occupation and structure of the village. There are 30 workers including 19 mens and 11 women engaging themselves in different activities the occupation data were agriculture in male ratio is 5 (16.66) and female is 1(3.33), agriculture labour is 4 (13.33) in male and 5(16.66) in female. Non agriculture is 3(10) in male and 2 (6.66) in female. Job members are 5 (16.66)

male and female are nil. There are no business holders in village, others occupation male is 2(6.66) & in Female 3(10) & overall 30 sampling in Mangundi village.

Prakalpa and Mishra (2014) revealed that majority of the respondents, engaged in dairy and clothing construction (25%), followed by clay work (13.75%), making donapattal (12.50 %) and minimum respondents were engaged in weaving (5 %).

Kashyap (2015) indicated that maximum proportion of the participants who were professionals (74%), semi professionals (22.8%) and clerks/supervisors/shop owners (34.0%) belonged to the categories of upper class, upper middle class and lower middle class, respectively. On the other hand, skilled worker respondents mainly fall in the categories of lower middle (21.0%) and upper lower (19.5%). About 24.4 per cent of the semi-skilled participants were lying in the category of upper lower and 53.7 per cent of the unskilled participants lie in the category of SES status in terms of occupational stress was calculated within the SES status.

2.2.2 Land holding

Kumar *et al.* (2010) indicated that 52.50 per cent of the respondents had “semi-medium” operational land holding, followed by 22.5 and 17.50 per cent respondents had “small” and “medium” operational land holdings, respectively. Only 7.50 per cent of the respondents had “large” operational land holdings. Thus, it can be concluded that majority of the respondents were having. “Semi-medium” operational land holding. The total area under capsicum crop of the sampled farmers was 48.25 acres, out of which only 4.56 acres area was under protected capsicum cultivation.

Savita *et al.* (2011) found that, there was a slight increase in the percentage of farmers belonging to medium farmers’ category from 33.34 per cent before to 40.67 per cent after and large farmers from 19.34 per cent before to 20.66 per cent after. In case of small farmers, there was decrease from 36.66 per cent before to 30.67 per cent after. There was decrease in the percentage of marginal farmers from 10.66 per cent before to 8.0 per cent after implementation of Community Based Tank Management Project.

Veer *et al.* (2011) revealed that 32.50 per cent of the farmers had small size of land holding.

Gamanagatti and Dodamani (2016) revealed that average size of the land holding was 1.29 ha, 2.65 ha, and 7.77 hectares for small, medium and large farmers, respectively and the respective leased in lands held by them was included 0.06 ha, 0.27 ha, and 0.81 hectares. Bt cotton was the most popular commercial crop in the study area as average area allocated for the Bt cotton was 0.89 ha, 1.7 ha, and 3.98 hectares for small, medium and large farmers, respectively.

Patel *et al.* (2016) observed that majority of the beneficiary farmers (48.00%) were small farmers having 1.01 to 2.00 ha of cultivable land. Whereas, majority of the non-beneficiary (44.00%) farmers were marginal farmers having up to 1.00 ha of cultivable land.

Shukla and Gupta (2016) indicated that out of 100 farmer in each category-adopter and non-adopter, the highest number of 60 farmers (60%) belonged to marginal size of holding, followed by 20 per cent farmers belonged to small and 20 per cent medium/large categories, respectively, maximum number of sample farmers from adopter and non-adopter were taken because of small size of holdings.

2.2.3 Soil type

Dhruw (2014) showed that the farmers group about 70.32 per cent of the land belonged to kanhar type of soil. Whears, 19.54 per cent under matasi, 9.68 per cent under dorsa and 0.46 per cent bhata soil.

Pradham (2017) explained that most of the respondents (97.50%) were occupied *Entisols* types of soil, followed by *Inceptisols* type of land (77.92%) and *Alfisols* type of land (68.33%). It was also found that about one fourth of the respondents occupied *Vertisols* type of land.

2.2.4 Irrigation facilities

Andhari *et al.* (2010) revealed that 37.33 per cent of the respondents tomato growers had fair irrigation facilities, followed by the 33.00 and 29.67 per cent which of them poor and good irrigation facilities, respectively.

Deshmukh *et al.* (2011) revealed that in case of irrigated land, 69 of the respondents (76.67%) has 0 to 2.5 acres, followed by 11 respondents (12.22%) has 2.5 to 5 acres and 10 respondents (11.11%) have more than 5 acres.

Savita *et al.* (2011) indicated that there were increase in number of wells from 23.34 per cent before to 42.00 per cent after implementation of the project. Similarly, in case of bore well it increased from 12.00 per cent before to 19.34 per cent after implementation of Community Based Tank Management Project.

Sharma *et al.* (2011) revealed that 71.67 per cent of the respondents had medium level of irrigation potentiality about garlic cultivation, followed by 17.50 per cent low and 10.83 per cent high, respectively.

Dessalegna *et al.* (2014) found that about 17.1, 38.6, 24.3, 11.4, and 8.6 per cent of respondents in the study area irrigate their mango trees at ≤ 10 days interval, 11-20 days interval, 21-30 days interval, > 30 days interval and no irrigation, respectively.

2.2.5 Farm power

Singh *et al.* (2009) noticed that more number of the respondents (36.0%) had diesel engine/ electric motor, 21.0 per cent have bullocks and only 11.0 per cent used a tractor as farm power. About 32.0 per cent respondents had no farm power.

Shukla and Sharma (2010) revealed that majority of the respondents (71%) had 1-2 drought animals, followed by 16 per cent of respondents who had 3-4 drought animals. The percentage of respondents who had 5-6 drought animals was equal to the percentage of respondents with no drought animals (5%). There was only one farmer who had tractor.

Savita *et al.* (2011) revealed that the percentage increase in the number of bullocks by the respondents having one pair increased from 25.34 per cent before to 41.34 per cent after implementation of Community Based Tank Management Project. It was evident that two pairs of bullock owned by the 5.34 per cent respondents after implementation of Community Based Tank Management Project. The respondents having power tiller was increased from zero to 1.34 per cent after implementation of

community based tank management project. The respondents owned sprayer increased by 30.0 per cent before to 41.34 per cent after implementation of the project and same in case of dusters increased from 6.00 per cent before to 11.34 per cent after implementation of community based tank management project. The respondents owned tractors (1.34%) remained as same before and after implementation of Community Based Tank Management Project.

Nand *et al.* (2012) observed that most of the members have not any owned land, 95 per cent had neither draught animal / tractor / power tiller and only 5 per cent had 1–2 draught animals.

Sharma *et al.* (2016) found that majority of the farmers (83%) kept animals between 2 to 5 which indicated that either milk production was only for home consumption or if extra could have sold to the cooperative societies to meet out domestic needs.

2.2.6 Annual income

Badodiya *et al.* (2011) indicated that after the engaging of respondents in MNREGA programme, a higher percentage of the beneficiaries (59.09%) increased their annual income up to Rs 5000 to 9000/- and belonged to medium income category, followed by 30.91 per cent beneficiaries increased their annual income above Rs 9000/- and belonged to high income category, whereas only 10.00 per cent beneficiaries increased their annual income up to Rs 5000/- and belonged to low income category.

Salunkhe *et al.* (2012) revealed that the majority of agro-service providers (52.00%) and beneficiaries (60.00%) had medium level of annual income, followed by 25.00 per cent each had higher level of annual income and 23.00 and 15.00 per cent of them had lower level of annual income, respectively.

Prakalpa and Mishra (2014) found that majority of the respondents belonged to family having monthly income of Rs. 250-500 and 700-above (30%), followed by 27.50 per cent in the monthly family income of Rs.500-700 and minimum (12.50%)

were in the monthly family income of Rs. up to 250 Rs. Majority of the respondents were having the monthly income more than Rs. 500 per month.

Chavai and Kadam (2016) revealed that 54.16 per cent of the respondents possessed medium level (Rs. 3,50,001 to 4,65,000) of additional gain in income from yield of pomegranate. While, 16.67 per cent of the respondents possessed low level (Rs. 3,50,000) of additional gain in income. Further, it was found that 15.84 per cent and 13.33 per cent of the respondents possessed moderate (Rs. 4,65,001 to 5,42,500) and high (Rs. 5,42,501 and above) additional gain in income, respectively. From the above findings it can be concluded that majority of the respondents were found in medium level (Rs. 3,50,001 to 4,65,000 Rsha⁻¹) of income from pomegranate.

Santosh and Bheemappa (2016) indicated that high per cent of respondents were noticed in medium levels of economic motivation (72.66%), innovative proneness (59.33%) and achievement motivation (54.33%), followed by distribution in management orientation (46.00%) and medium risk orientation (37.33%). Similarly, a high percent of respondents belonged to intermediate level of decision making ability (64.67%).

2.2.7 Credit acquisition

Bolarinwa and Fakoya (2011) disclosed that majority of farmers (64.0 and 76.0%) obtained credits from relative/ friends and moneylenders, respectively while 12.0 and 25.6 per cent of farmer's secured loan from commercial banks and Nigeria Agricultural and Rural Development bank. It is obvious that farmers depended on informal creditors who charge exorbitant interest rates. They have not been able to exploit the low interest rate charge by formal credit institution.

Sharma *et al.* (2011) observed that 63.33 per cent of the respondents had medium level of credit orientation about garlic cultivation, followed by 25.00 per cent high and 11.67 per cent low level.

Singh (2014) revealed that the majority of the respondents (55.00%) had acquired the credit. Whereas, 45.00 per cent respondents had not acquired the credit. Out of the credit acquiring respondents (total 88) the majority of the respondents

(70.46%) had taken the short term credit, followed by medium term credit (29.54%) and none of the respondents had taken long term credit.

Devaki *et al.* (2015) showed that 45.00 per cent of the farm women availed credit, while the remaining 55.00 per cent had not availed any credit provided by various sources. Among those who availed credit, most of the respondents (40.00%) obtained credit from private sources, followed by nationalized banks (31.00%), Co-operatives (22.00%) and traders (7.00%).

Grandhi *et al.* (2016) observed that 55.83 per cent of the respondents has received less number of loans, followed by average number (35.00%) and 9.17 per cent had taken more number of loans.

2.2.8 Material possession

Shukla and Sharma (2010) indicated that 77 per cent respondents were possessing bullock carts and 43 per cent possessed bicycle/moped. The number of farmers who possessed radio, chairs and deshi plough were 11, 15 and 61 per cent, respectively.

Vishnugouda *et al.* (2011) showed that 50 per cent of the respondents had possessions of either five to ten farm animals or materials such as gobar gas/pump set/motor cycle. More number of farmers were found to possess motor cycles than farm animals. Data showed that two categories had 18.3 per cent of respondents showing 29 either two to three farm animals or materials like bullocks/radio/improved farm implement/news paper/electricity etc. Only 13.4 per cent of respondents had either more than ten farm animals or materials (tractors/automobile). The finding shows that possessions of respondents were of medium to high level there by showing their medium standard of living.

Nand *et al.* (2012) observed that maximum number of members (85%) possessed radios, cycles and chairs of their own and only 5 per cent had radios, cycle and chair and T.V. and rest 10 per cent had only chairs.

Kumari and Laxmikant (2015) found that the majority of trained and untrained women belonged to category II (Traditional material like radio, cycle, chair and

watch), followed by category I (Having negligible material possession) and category III (Modern household appliance and material like pressure cooker, T.V., gas stove, sewing machine, refrigerator and moter cycle).

Soni *et al.* (2016) indicated that majority (57.50 and 75.00%) of the respondents possessed medium level of material possession, followed by 39.00 and 13.00 per cent and 3.50 and 12.00 per cent of them possessed low and high level of material possession respectively before and after joining SHG.

2.3 Technological characteristics

2.3.1 Storage

Modi *et al.* (2010) observed that a high per cent of respondents had knowledge about types of storage losses (91.67%) and keeping mango fruits in plastic trays as the best method of storage (90.00%). Whereas, practice of maintaining optimum temperature for storage of mango fruits was known to less than one-third of respondents and very least percentage (10.83%) were knowing that chilling injury leads to reduction in fruit quality and method for increasing shelf life of fruits.

Bheemudada and Natikar (2016) revealed that 18.33 per cent of the farmers had knowledge about recommended storage practices. The reasons may be due to the fact that more number of the Ginger growers were having medium level education with medium level of farming experience medium level of extension contact and mass media which might had this kind of results.

2.3.2 Processing and value addition

Kamble and Soni (2009) observed that improved boiling pot retained 3.33 per cent essential oils and 2.30 per cent curcumin as against 2.93 and 2.57 per cent, respectively in traditional boiling pot. Also it was observed that turmeric rhizomes boiled for 35 minutes in improved potgave uniform colour than rhizomes boiled for 25 and 45 minutes.

Anantkawlas (2014) reported that about 80 per cent of turmeric produced in India is consumed for domestic kitchen use in food preparations, 8 per cent at hotels

and tourist complexes, 6 per cent in manufacturing of Pharmaceuticals, cosmetic products and ayurvedic medicines and 6 per cent being exported in various forms.

Venkatesan and Vijayalakshmi (2015) showed that the overwhelming majority (75.83%) of the farm women expressed their feelings for high to very high training needs in packaging and branding. The other important activities under food processing in which the majority of the respondents expressed high to very high training needs was, value addition of vegetables (68.34%).

2.4 Communicational characteristics

2.4.1 Extension Contact

Venkataramalu *et al.* (2004) indicated that 35.83 per cent of the respondents contacted private agency extension personnel 'once in a week'. While, 25.00 per cent had contact with village level. Worker 'once in a month' and 25.00 per cent had contact with Agricultural Officer (A.O.) whenever problem occurs. 15.83 per cent and 12.50 per cent per cent of respondents were contacted university scientists 'whenever problem occurs' and extension personnel 'once in a month', respectively.

Poonia and Dhaka (2011) observed that majority of the respondents (65.00%) had low level of extension contact, followed by 29.16 per cent medium level and 5.84 per cent of the respondents had high level of extension contact.

Garg *et al.* (2013) reported that about 54 per cent of the respondents had medium level of extension contacts. Whereas, more than one fourth per cent of the respondents (26.66%) had high level and rest of the respondents (19.17%) had low level of extension contacts. Only 26 per cent of the respondents maintain the high extension contacts. Rest of the respondents may solve their problems by discussing either among their elders or fellows.

Sajeev and Saroj (2014) found that among the cashew farmers, majority (68%) had low extension contact, while 23 and 9 per cent farmers had medium and high extension contact, respectively.

Girawale *et al.* (2016) revealed that majority of farmers (62.85%) had medium level of extension contact, followed by low (21.42%) and high (15.71%) level of extension contact.

2.4.2 Mass media exposure

Patil *et al.* (2010) revealed that a more than one-third of the respondents (35.00%) were noticed to be medium mass media users. Further the detailed analysis of mass media use shows that a majority of respondents were regularly watching agriculture programmes in Television (73.57%), followed by Radio (36.00%), Newspapers (32.86%) and farm magazine (22.86%). The more inclination towards audio-visual type of programmes and possession of TV sets might be the reasons for the situation.

Gondkar *et al.* (2012) observed that the mean mass media score was 8.03. The scores ranged very closely from 6 to 13, indicated that consistency among the respondents on their mass media exposure. The frequencies did not fall into a normal distribution, skewed towards the higher side of exposure to mass media. A majority (53.35%) of farmer had high level of mass media exposure.

Garg *et al.* (2013) studied in the terms of viewing farm telecast, listening to radio programmes, reading magazines, newspaper, package of practice, etc. The respondents were placed into three categories *i.e.* low, medium and high by using range method. It was quite clear that about 50 per cent of the respondents had medium mass media exposure, whereas 35 per cent of them had low mass media exposure. Possible reason for less mass media exposure may be that farmers may not be free at the time of telecast/broadcast of agricultural programme on T.V. and radio.

Singh and Verma (2014) found that in KVK Shahjahanpur, the group meeting/discussion had mean score 5.42, followed by folder/leaflet/pamphlets (4.42), demonstration (3.66), farm magazine (2.83) and Agricultural Scientists (2.53) got the rank order I, II, III, IV and V, respectively. Further input dealer (2.19), television/radio (2.13), newspaper (1.77), block officials (1.11) and farmer's fair (0.19) got the rank

order VI, VII, VIII, IX and X, respectively. It was same trend found in KVK Ghaziabad.

Devaki *et al.* (2015) observed that 57.00 per cent of the farm women had low level of mass media exposure followed by high (43.00%) level. Illiteracy, poor socio-economic status and lack of leisure time might have deprived them from getting access to various mass media sources.

Jana *et al.* (2016) noticed that the radio is playing an important role in disseminating agricultural technologies to farming communities. It is a very convenience mass media to access information compare to other impersonal media and it was reported by nearly about half of respondents (46%). At the lowest 4 per cent of respondents told that they collected information from book. Other impersonal sources were T.V. (25%), Newspaper (9%), magazine (6%), internet (5%) and kisan call centre (7%).

2.5 Psychological characteristics

2.5.1 Scientific orientation

Venkataramalu *et al.* (2004) implied that when 'medium' and 'high' scientific orientation level of respondents were combined together the percentage is about 90.00 per cent which is a good sign and speaks of interest of respondents to view the things scientifically, Since the majority of the respondents were literate they might have keenly interested in the scientific aspects of chilli cultivation.

Sunil and Manjula (2010) reported that nearly an equal per cent (43.33%) of the trained and untrained respondents had medium level of scientific orientation, followed by 35.00 and 28.33 per cent of the trained and untrained belonged to high level of scientific orientation, respectively.

Jha (2012) indicated that the majority of the respondents (57.50%) had low level of scientific orientation, while 35.83 and 6.67 per cent of them had medium and high level of scientific orientation, respectively.

Mohapatra and Sahu (2012) observed that 56.25 per cent of the respondents had low level of scientific orientation, whereas 35.00 per cent of the respondents had

low level .Thus only 08.75 per cent of the respondents belonged to high level of scientific orientation.

Shriwas *et al.* (2015) showed that majority of the respondents (84.17%) had medium level of Scientific– orientation, followed by 10.00 per cent, who had low level of scientific–orientation and 5.83 per cent of respondents had high level of scientific orientation regarding brinjal production technology.

2.5.2 Risk orientation

Venkataramalu *et al.* (2004) reported that medium level of risk orientation was noticed by 73.33 per cent of chilli farmers, however high risk orientation was noticed by 15.00 per cent of respondents. On the contrary, 11.67 per cent of farmers possessed low risk orientation.

Marbaniang *et al.* (2011) reported that about 19.26 per cent of the respondents with agriculture + dairy had high level of risk orientation, followed by agriculture + non-farm (17.78%) who had medium risk orientation. As nearly half of the respondents (47.40%) were educated up to primary school, the respondents really had capacity to take decision under uncertainty and can also withstand the uncertainties in their activity. Thus, an individual can progress in his/her day-to-day livelihood activities.

Gondkar *et al.* (2012) indicated that majority of the entrepreneurs (73.3%) found to have medium risk orientation, followed by 11.7 per cent entrepreneurs having low risk orientation and 15 per cent high risk orientation.

Khalache *et al.* (2012) revealed that 90.00 per cent of the respondents had medium level of risk orientation, followed by 5.00 per cent had low and high, respectively.

Modi *et al.* (2013) showed that 50.00 per cent of the respondents had medium risk orientation, followed by 24.17 and 25.83 per cent were found to possess high and low risk orientation. Lack of technical knowledge on improved post- harvest practices, low economic returns on investment, lack of financial support and labour problem

might have forced the respondents to take medium level of risk in post-harvest management practices.

2.5.3 Cosmopolitaness

Andhari *et al.* (2010) indicated that more than half of the respondents (56.33%) had medium cosmopolitaness, followed by 22.33 per cent of them had low cosmopolitaness and 26.33 per cent had high cosmopolitaness.

Sunil and Manjula (2010) revealed that 41.66 and 38.33 per cent of the trained and untrained respondents had medium level of cosmopolitaness, followed by low (31.66 and 28.33%) and high (26.66 and 33.33%) level of cosmopolitaness, respectively. This type of results is due to the fact that the cities/towns are nearer to the village of the respondents with the availability of good transport facilities.

Veer *et al.* (2011) showed that majority of respondents (55.83%) had medium level of cosmopolitaness, followed by 27.50 per cent of the respondents had low and 16.67 per cent of high cosmopolitaness.

Khalache *et al.* (2012) observed that most of the respondents (60.00%) had medium level of cosmopolitaness about cotton growers, followed by 27.50 per cent low and 12.50 per cent high level of cosmopolitaness.

Kumari and Laxmikant (2015) indicated that maximum percentage of trained women were having medium level of cosmopolitaness, followed by high and low level whereas in case of untrained women, mostly were having low level of cosmopolitaness followed by medium and high level.

2.5.4 Achievement motivation

Kumar and Sharma (2009) indicated that 70.00 per cent of the respondents had medium level of achievement motivation, followed by 17.50 and 12.50 per cent of them had low and high, respectively.

Nagesh *et al.* (2011) revealed that 80.84 per cent of respondents had medium achievement motivation, followed by 11.66 and 7.50 per cent of respondents having low and high achievement motivation, respectively.

Modi *et al.* (2013) indicated that majority of respondents (64.16%) belonged to medium level of achievement motivation, followed by low (19.17%) and high (16.67%) level of achievement motivation. Not confident of higher returns and lack of confidence to practice improved management practices might be reasons for the results.

Fartyal and Rathore (2014) evidents that majority of the respondents (71.43%) had medium level of achievement motivation, followed by low (19.39%) and 18.36 per cent men had high achievement motivation which very clearly depicts the status of women in our society where women are most of the time suppressed to aim high.

Boruah *et al.* (2015) observed that majority of the respondents (61.67%) had medium level of achievement motivation, whereas 20.83 per cent respondents high and 17.50 per cent of them had low level of achievement motivation.

2.5.5 Economic motivation

Jaganathan *et al.* (2009) found that a higher percentage of the respondents (71%) had medium level of economic motivation, followed by 17 per cent low and 12 per cent high economic motivation, respectively.

Patil *et al.* (2010) foud that around equal per cent of respondents were noticed in low (40.71%) and high (36.43%) economic motivation. The inclination of the respondents to take up successful organic farming with the available facilities might have favoured the situation.

Marbaniang *et al.* (2011) revealed that economic motivation was highly significant associated with the livelihood activities. About 18.52 per cent of the Tibetan rehabilitants with agriculture + dairy had high level of economic motivation, followed by agriculture + non-farm (17.04%) who had medium level of economic motivation. This shows that there was a significant difference between the selection of livelihood activities and economic motivation among the Tibetan rehabilitants.

Nagesh *et al.* (2011) indicated that majority of the respondents (65.83%) had medium economic motivation, followed by 18.33 and 15.84 per cent of the respondents belonging to high and low economic motivation groups, respectively.

Jha (2012) observed that the majority of the respondents (55.83%) had medium level of economic motivation, followed by 26.67 and 17.50 per cent who had high and low level of economic motivation, respectively.

Patil *et al.* (2014) revealed that majority of the khol crop growers (61.00%) had medium level of economic motivation. Whereas, 24.00 and 15.00 per cent of the farmers belonged to low and high level of economic motivation categories, respectively.

2.5.6 Awareness about NHM

Rai and Singh (2008) revealed that majority of respondents (60%) had partial awareness, whereas a very low proportion (15%) is having complete level of awareness. Thus, it can be concluded that only 25 per cent of respondents had incomplete awareness regarding recommended watershed practices.

Jaganathan *et al.* (2009) indicated that majority of the respondents (63.00%) had medium level of awareness about organic farming practices, followed by 17 per cent high and 10 per cent low level of awareness about organic farming.

Veer *et al.* (2011) observed that majority of respondents (81.67%) found in unaware group, whereas only 18.33 per cent of respondents were in aware group about 'MARKNET'.

Singh *et al.* (2016) indicated that most of the respondents (46.67%) were having high level awareness about National Horticultural Mission, followed by 27.50 per cent of respondents were with medium level of awareness and 25.83 per cent of the respondents were having low level of awareness.

Sonawane and Neware (2016) revealed that majority (61.74%) of the respondents had 'medium' awareness about adverse effects of pesticides, while remaining 20.00 and 18.26 per cent of the respondents had 'low' and 'high' awareness, respectively. On an average, awareness of the respondents had 17 score.

2.5.7 Attitude towards NHM

Jaganathan *et al.* (2009) indicated that majority of the respondents (64%) had a favorable attitude, followed by 22 per cent of them less favorable and 14 per cent of the respondents had most favorable.

Rai *et al.* (2012) examined the attitude of NHM beneficiaries and non-beneficiaries under this study. In almost all the statements regarding attitude, the mean score values of attitude of beneficiaries were higher than non-beneficiary. The average mean score values of attitude showed by the beneficiaries and non-beneficiaries were 2.47 and 1.60, respectively. The calculated 't' value was 15.85 at 5 per cent level. This was declared to be significant. This clearly shows that as regards the attitude, there was a significant difference between beneficiaries and non-beneficiaries for NHM.

Waghmode *et al.* (2013) observed that 47.50 per cent of the respondents possessed favorable attitude towards NHM, followed by 35.00 per cent and 17.00 per cent of the respondents possessed neutral and unfavorable attitude, respectively.

Pagaria (2014) indicated that majority of the farmers (83.3%) were found to be favourable in the feeling about vermicompost technology. Nearly one fourth of the farmers (24.7%) were found to be favourably disposed towards vermicompost. Only 12 per cent farmers were observed to be unfavourable in the reaction about vermicompost. The farmers in general were thus favourable in their feelings towards vermicompost production but due to lack of detailed knowledge about this technology they were not undertaking its production. The persuasion through regular guidance trainings, demonstration and required infrastructure seems to be essential.

Smitha *et al.* (2017) illustrated that two fifth of the farmers (40.00%) had neutral attitude towards GT followed by 28.00, 22.00 and 10.00 per cent with favourable, most favourable and unfavourable attitude, respectively. None of them had strongly unfavourable attitude. It can be concluded that half of the farmers (50.00%) who adopted GT had favourable to most favourable attitude.

2.5.8 Knowledge level of turmeric growers

Gupta *et al.* (2010) indicated that the maximum number of respondents (62.98%) had low level of knowledge, followed by medium (21.64%) level of knowledge and high (15.38%) level of knowledge about the side effects of pesticide.

Meena *et al.* (2010) revealed that half of the respondents (50.00%) fell in medium level of knowledge group whereas, 35.83 per cent rose growers were observed in the low level of knowledge group and remaining 14.16 per cent respondents possessed high level of knowledge about improved rose cultivation technology.

Sasane *et al.* (2010) revealed that almost all of the brinjal growers had complete knowledge about selection of soil and preparatory tillage operations, transplanting irrigation management, harvesting. Majority of brinjal growers had complete knowledge about intercultural operations (91.67%), selection of seeds (87.50%), varieties (80.00%), nursery management (72.50 %), planting methods (90.00%) and spacing (87.50%) and 72.50 per cent farmers had complete knowledge about plant protection.

Badhe and Saiyad (2011) concluded that majority of the brinjal growers (62.50%) had medium level of knowledge regarding recommended practices of brinjal, while 21.67 and 15.83 per cent of brinjal growers had high and low level of knowledge, respectively.

Gaikwad *et al.* (2011) revealed that more than half of the extension personnel (54.05%) belonged to medium knowledge level whereas, 28.57 per cent of respondents belonged to high knowledge level category and 17.37 per cent of the respondents belonged to the category of low knowledge level.

Thombre *et al.* (2013) observed that majority of the grape growers (63.33%) had medium level of knowledge while, 23.33 per cent of them had low and only, 13.34 per cent of the grape growers had high level of knowledge.

Chavai *et al.* (2015) reported that most of the turmeric growers had complete knowledge of drying of turmeric (100%), storage in gunny bags (99.09%), polishing by using drum (92.72%) and testing of boiled turmeric by hand pressing (92.72%).

However, 58.18 per cent of them had complete knowledge in storage of turmeric incold storage, while 67.27 per cent of them had partial knowledge about scientific method of boiling.

Singh *et al.* (2015) observed that majority of the on-campus trainees (71.20%) had high level of knowledge, followed by medium level of knowledge (25.60%) and low level of knowledge (3.20%), whereas in case of off-campus trainees 78.40 per cent respondents had medium level of knowledge, 12 per cent had high level of knowledge, followed by 9.60 per cent had low level of knowledge.

2.5.9 Adoption level of turmeric growers

Karpagam (2006) indicated that 65.83 per cent of the respondents belonged to medium adoption category with mean adoption score of 69.13, followed by 17.50 and 16.67 per cent of the respondents belonging to high and low adoption categories with mean adoption scores of 84.00 and 53.93, respectively

Sasane *et al.* (2010) revealed that almost all brinjal growers had complete adoption about selection of soil and preparatory tillage. Majority of growers had complete adoption about intercultural operations (93.34%), irrigation management (92.20%), harvesting (89.17%), nursery management (42.50%), fertilizer management (35.00%) and transplanting (52.50%).

Sawant *et al.* (2013) observed that majority of the respondents had medium adoption level with respect to recommended package of practices for turmeric cultivation and only comparatively small percentage had high level of adoption.

Ovhar and Wakle (2013) revealed that two third of the farmers (56.67%) were included under medium category of adoption level of improved cultivation practices, followed by low level of adoption (22.22%) and 21.11 per cent farmers were found in high level of adoption of improved cultivation practices of turmeric.

Babu *et al.* (2015) observed that a large number of tribal farmers still practice the traditional method of cultivation of turmeric. Turmeric is cultivated in slop with or without terraces and in plains as a sole crop and intercrop. Dughi, Jobedi, Katigia, Local, Lakadong, Ranga, Rasmi and Suroma varieties of turmeric are grown in

Odisha. Turmeric is cultivated by the farmers of Odisha for home consumption, seed purpose and for source of income. It has been observed that technological interventions like rhizome treatment, soil application of *Trichoderma* (bio-control agent) in well rotten cow dung, wood ash, crop rotation, mulching, plant protection measures increased rhizomes yield by tune of 20-30 per cent at farmers field.

Chavai *et al.* (2015) revealed that majority of the turmeric growers had high adoption in harvesting of the turmeric at 8-9 months (83.64%), traditional method of boiling (90.00%), drying (100%), polishing of turmeric by using drum (98.18%), grading of the turmeric (100%) and storage of turmeric in gunny bags (95.25%). Adoption to the medium extent in testing of boiled turmeric by use of sticks (41.82%) and use of warehouses for storage (24.55%). Turmeric grower had low adoption in scientific method of boiling (07.27%) and use of cold storage for storage of turmeric (04.55%).

2.6 Impact of NHM on socio-economic status of turmeric growers

Dubey *et al.* (2008) revealed that 43.33 per cent of the on campus trainees had medium socio-economic status, followed by low socio-economic status (36%) and only 20.67 per cent had higher level of socio-economic status. whereas, in case of on-campus trainees 55.33 per cent had low socio-economic status, followed by 42 per cent medium level and only 2.67 per cent had high level of socio-economic status. Thus, it can be concluded that the on-campus trainees had higher socio-economic status than the off-campus trainees. The calculated value of 'Z' was found to be 5.23, which was greater than the table value of 'Z' (1.96) at 5 per cent level of significance.

Singh *et al.* (2009) indicated that majority of the farmers (66%) belonged to medium socio-economic status, followed by 18.00 per cent to low socio-economic status. While, 16.00 per cent farmers possessed high score category of socio-economic status.

Bolarinwa and Fakoya (2011) made comparison between the socio-economic scores of beneficiaries and non-beneficiaries. The results show that 16.0 and 73.6 per cent of beneficiaries and non-beneficiaries were belonged to low socio-economic

status, respectively. Credits availability accounted for majority (84.0%) of beneficiaries in above average SES, while 26.4 per cent of non-beneficiaries belonged to the same categories. Generally beneficiaries have higher SES than non-beneficiaries, a result of the accessibility to credit, which enable them to purchase many SES items, which non-beneficiaries could not afford.

Roy *et al.* (2013) revealed that most of the farmers (55%) belonged to medium SES category, followed by 26.67 per cent of farmers belonged to low SES category and 18.33 per cent farmers belonged to high SES category.

Singh and Verma (2014) found that 77.50 per cent beneficiaries were from medium socio-economic status group, while 39.00 per cent beneficiaries were from high socio-economic status group. 33.50 per cent beneficiaries were from lower socio-economic status group. Thus, it can be concluded that majority of beneficiaries were from medium socio-economic status background.

Singh *et al.* (2015) revealed that the majority of the on-campus trainees (45.60%) had medium socio-economic status, followed by low socio-economic status (36.80%) and only 17.60 per cent had higher level of socio-economic status, whereas, in case of off-campus trainees 53.60 per cent had low socio-economic status, while 41.60 per cent medium level and only 4.80 per cent had high level of socio-economic status. Thus, it can be concluded that the on-campus trainees had a higher socio-economic status than the off-campus trainees. The calculated value of 'Z' was found to be 5.16 which was greater than the table value of 'Z'. It is thus concluded that there was significant difference between trainees on and off-campus regarding their socio-economic status.

Chinchmalatpure (2016) reported that nearly half of the respondents (46.80%) had medium level of socio-techno-economic changes followed by 28.40 and 24.80 per cent of the respondents had low and high level of socio-techno economic changes, respectively. Thus, it can be concluded that majority of the respondents (71.60%) had medium to high level of socio-techno economic changes.

Soni *et al.* (2016) indicated that majority of the respondents (65.50%) had medium level of SES, followed 33.50 and 1.00 per cent of them had low and high level of SES before joining the SHG.

2.7 Impact of NHM on productivity of turmeric

Bolarinwa and Fakoya (2011) noticed that the estimated total crop production for cocoa 80,000 tons and yam 22,510 tons for beneficiaries were higher than cocoa production 21,000 tons and yam production 9,110 tons by non-beneficiaries. Low production level of non-beneficiaries may be attributed to poor capital base needed to purchase inputs necessary to improve production. That is limited capital available to the farmers in form of unspent farm incomes and present level of credit supply are generally not enough to embark on any meaningful improvement of their farms.

Kadam *et al.* (2013) studied the differences in economics of crop production by development of watershed project. The percentage increase in average cost and gross return was significant in case of cotton and wheat crops followed by jowar crop indicating good response for water availability due to implementation of watershed project. The net return over cost was increased from 11.68 to 36.52 per cent in soybean and wheat crop, respectively.

Kiruthika (2013) indicated that the size of farmers increased the net returns per hectare also increased. It was Rs. 99380, Rs. 135317 and Rs. 167556 in marginal, small and large size farmers, respectively. The net returns/kg of turmeric was also high for large farmers with Rs. 20.35 when compared with small (Rs. 17.51) and marginal (Rs. 13.18) farmers.

Sanjeev and Saroj (2014) showed that households had an average number of 173 cashew trees with a mean yield of 2.45 kg/tree. More than half of the cashew farmers (55%) realized only moderate yields with an average net income of Rs. 29,664/year against an average expenditure of Rs. 9293/year.

Patel *et al.* (2015) indicated that 51 to 100 per cent annual average production of date palm per tree was increased in 63 per cent beneficiary farmers, followed by 22 per cent beneficiary farmers acquired 101 to 150 per cent increment in their annual

average production of date palm per tree. While, on the part of non-beneficiary farmers, majority (85%) of them got below 50 per cent increment in their annual average production of date palm per tree. The rest of percentage increase in annual average production of date palm per tree was negligible both on the part of beneficiary and non-beneficiary farmers 15 per cent only.

2.8 Constraints

Landge *et al.* (2010) revealed that majority of the banana growers faced many problems like regular load shading of electricity for too long interval in day time that was expressed by 93.78 and 89.58 per cent of drip and flood irrigated banana growers, respectively. Non-availability of labours for harvesting in time was next major problem which was expressed by 79.17 and 72.92 per cent of drip and flood irrigated banana growers, respectively.

Tavethiya (2010) reported that the important constraints perceived by cumin growers were weight and quality loss during storage and transportation, inadequate and irregular power supply, high charges of electricity, inadequate storage facilities, lack of marketing infrastructure facilities, lack of post harvest management facilities and fluctuation of cumin price in the market.

Sawant *et al.* (2013) found that the important constraints reported by turmeric growers were with respect to cultivation and marketing of turmeric namely, non availability of quality seed, high cost of seed, attack of rhizome fly, higher charges of commission agents and low market price.

Aglawe *et al.* (2014) observed that majority of the respondents (82.50%) faced constraints of more fluctuation in market price, followed by less technical knowledge about seed treatments (78.33%), non-availability of needed fertilizer and also lack of knowledge about proper fertilizer dose (70.83%).

Ovhar and Dhenge (2014) revealed that majority of the turmeric growers (72.22%) faced with constraints like low price of turmeric crop, one third of turmeric growers (63.33%) faced with constraints like non-availability of labour at the time of transplanting and harvesting, one third of turmeric growers (60.11%) faced with

constraints like irregular supply of electricity and non availability of storage facilities, majority of turmeric growers (50.56%) faced with constraints like Inadequate availability of improved seed, turmeric growers (40.00%) faced with constraints like high wages of labour, (38.89%) turmeric growers faced with constraints like inadequate sources of finance for agriculture and 22.22 per cent turmeric growers faced with constraints like inadequate availability of FYM.

Bheemudada and Natikar (2016) studied the constraints in adoption of improved Ginger cultivation practices. In order of priority, majority (90.83%) expressed non-availability of pest and disease resistant varieties, followed by non-availability of labour (87.50%), high cost of labour charges (85.00%) and non-availability of chemical fertilizers (79.17%) as problem faced by them. It is also found that, 76.67 per cent of farmers expressed lack of storage facilities as the constraint, followed by high cost of plant protection chemicals (75.00%) and lack of processing units (74.17%). Further, most of the respondents expressed problems like, exploitation by middlemen (70%), followed by low price for produce (69.17%) and irregular supply of electricity for irrigation (65.83%).

2.9 Suggestions

Landge *et al.* (2010) noted that supply of electricity that was suggested by 87.50 and 83.33 per cent of drip and flood irrigated banana growers, respectively.

Tavethiya (2010) observed that the important suggestions offered by more than 60.00 per cent of cumin growers were irrigation sources should be increased (rank first), remunerative price should be given to the cumin growers (rank second), market facilities should be strengthened (rank third), regular and sufficient electricity should be provided (rank fourth) and all agricultural inputs should be made available at subsidized rate (rank fifth).

Mustafa *et al.* (2011) showed that vast majority of aonla growers (91.66%) wanted marketing guidance, ensured transportation (78.33%), popularization of high density orchard (75%), rejuvenation of old orchard (70.83%), proper pruning after harvesting (70%) and availability of quality planting material (68.33%) which were

taken as the major strategies envisaged by aonla growers to overcome constraints for improving the practices of aonla cultivation.

Sawant *et al.* (2013) observed that important suggestions made by turmeric growers were assured and reasonable selling price, demonstration on control of rhizome fly attack, timely availability of quality seeds and credits, timely guidance of VEWs and organization of farmers rallies, exhibitions, elimination of middle men in marketing, providing fertilizers and pesticides at subsidized rate and starting separate turmeric research station in Satara district.

Aglawe *et al.* (2014) observed that 92.50 per cent of the respondents suggested that, there should be minimum support price for turmeric, market facilities should be provided by the government (90.83%), control of middleman and commission agent by adopting control measures of rules and regulation (86.60%).

CHAPTER-III

MATERIALS AND METHODS

Research methodology is a detailed action plan of investigation. This chapter narrates the methods and procedure of investigation used during the entire course of study and is presented under the following heads:

- 3.1 Location of the study area
- 3.2 Research design
- 3.3 Sample and sampling procedure
- 3.4 Independent and dependent variables
- 3.5 Operationalization of independent variables and their measurement
- 3.6 Operationalization of dependent variable and its measurement
- 3.7 Derivation of hypotheses
- 3.8 Conceptual model of the study
- 3.9 Constraints faced by the turmeric growers in adoption of turmeric cultivation
- 3.10 Suggestions given by the farmers to minimize the constraints
- 3.11 Type of data
- 3.12 Developing the interview schedule
- 3.13 Validity
- 3.14 Reliability
- 3.15 Method of data collection
- 3.16 Statistical analysis
 - 3.16.1 Frequency and percentage
 - 3.16.2 Mean, standard deviation and rank
 - 3.16.3 Mean per cent score
 - 3.16.4 Per cent change
 - 3.16.5 Fishers 'Z' test
 - 3.16.6 Pearson's coefficient of correlation
 - 3.16.7 Multiple regressions
- 3.17 Operatinalization of the terms used in the study

3.1 Location of the study area

Chhattisgarh state is divided into three agro-climatic zones namely, Chhattisgarh plains, Northern hills and Bastar plateau. The study was conducted in five districts of Chhattisgarh plains agro-climatic zone during the years 2015-16 and 2016-17. The state comprises of 27 districts and NHM scheme has been implemented in 19 districts viz., Bilaspur, Durg, Kabirdham, Raigarh, Korba, Surguja, Jagdalpur, Raipur, Koriya, Jashpur, Rajnandgaon, Mungeli, Bemetara, Balod, Balrampur, Surajpur, Kondagaon, Gariyaband and Balodabazar. Out of which 12 districts were situated under Chhattisgarh plains agro-climatic zone of the state.

3.2 Research design

Ex-post-facto research design was followed for carrying out the study. Ex-post-facto research design is any systematic empirical enquiry in which the independent variables have not been directly manipulated because they have already occurred or they are inherently not manipulable. With respect to the type of variable under consideration, size of respondents and phenomenon to be studied, the ex-post-facto design was selected as an appropriate research design.

3.3 Sample and sampling procedure

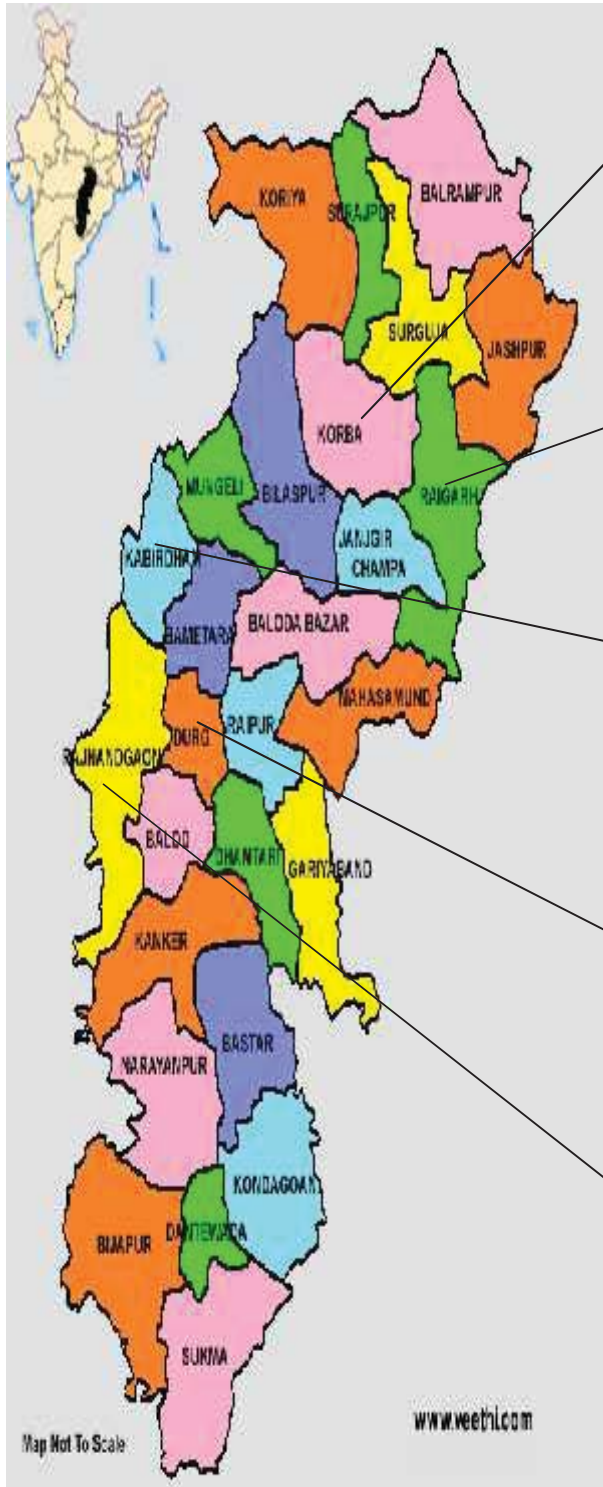
3.3.1 Selection of districts

NHM scheme has been implemented in 12 districts of Chhattisgarh plains agro-climatic zone in the state, out of which 5 districts namely, Kabirdham, Rajnandgaon, Durg, Raigarh and Korba were selected purposively on the basis of maximum area and maximum number of turmeric growers.

3.3.2 Selection of blocks

From each selected district, 2 blocks ($2 \times 5 = 10$) were selected purposively for the study on the basis of maximum area and maximum number of turmeric growers.

CHHATTISGARH



Korba



Raigarh



Kabirdham



Durg



Rajnandgaon

Fig. 3.1: Location map of the study area

Table 3.1: Selected districts, blocks and villages of the respondents

Districts	Blocks	Villages	Respondents		Total
			Beneficiaries	Non-beneficiaries	
1. Kabirdham	1.Kabirdham	1.Amlidih	4	4	8
		2. Samnapur	4	4	8
		3. Barpelatola	4	4	8
		4.Motiyari	4	4	8
	2.Pandariya	1.Sanakpat	4	4	8
		2. Nihalpur	4	4	8
		3. Saraiset	4	4	8
		4 Baghratola	4	4	8
2. Rajnandgoan	1.Rajnandgoan	1. Sankra	4	4	8
		2. Dumardikala	4	4	8
		3. Masul	4	4	8
		4. Bundelikala	4	4	8
	2.Dongargoan	1. Ari	4	4	8
		2. Konari	4	4	8
		3.Sankripar	4	4	8
		4.Barsantola	4	4	8
3. Durg	1.Durg	1. Kurud	4	4	8
		2. Basin	4	4	8
		3.Arasnara	4	4	8
		4. Bodegoan	4	4	8
	2.Patan	1. Ruhi	4	4	8
		2.Teligundra	4	4	8
		3. Achanakpur	4	4	8
		4. Khorpa	4	4	8
4. Raigarh	1.Dharmjaygarh	1. Mahrajgang	4	4	8
		2. Darridih	4	4	8
		3. Gersa	4	4	8
		4. Rilo	4	4	8
	2.Tamnar	1. Amaghat	4	4	8
		2. Ghodhi	4	4	8
		3. Kasdhol	4	4	8
		4.Harradih	4	4	8
5. Korba	1.Pondi-uprora	1.Nagoi	4	4	8
		2. Bhanwar	4	4	8
		3.Tuman	4	4	8
		4.Gharipakhna	4	4	8
	2.Katghora	1. Ranjna	4	4	8
		2. Dongari	4	4	8
		3. Basantpur	4	4	8
		4. Phooljhar	4	4	8
Total			160	160	320

3.3.3 Selection of villages

From each selected block, 4 villages ($4 \times 10 = 40$) were selected purposively on the basis of maximum area and maximum number of turmeric growers. Thus the total 40 villages were selected for this research work.

3.3.4 Selection of respondents

A comprehensive list of beneficiaries farmers was collected from Horticulture department for each selected village, 4 beneficiaries ($4 \times 40 = 160$) from the list and 4 non-beneficiaries ($4 \times 40 = 160$) farmers were selected randomly for the study. In this way total 320 farmers were considered as respondents (as shown in Table 3.1).

3.3.5 Collection of data

The data was collected personally through pre-tested semi structured interview schedule.

3.3.6 Statistical method

Collected data were tabulated and processed by using appropriate statistical methods.

3.4 Independent and dependent variables

The following independent and dependent variables were selected for this investigation.

Variables	Measurement
Independent variables	
Socio-personal characteristics	
➤ Age	Chronological age of the respondents
➤ Education	The procedure followed by Narbaria (2013)
➤ Caste	The schedule developed for this study
➤ Family size	The schedule developed for this study
➤ Family type	The schedule developed for this study
➤ Social participation	The procedure followed by Guru <i>et al.</i> (2015)

➤ Experience in turmeric cultivation	Completed years of experience in farming
➤ House type	The procedure followed by Guru <i>et al.</i> (2015)
Socio-economic characteristics	
➤ Occupation	The procedure followed by Guru <i>et al.</i> (2015)
➤ Land holding	The procedure followed by Pallavi (2016)
➤ Soil type	The schedule developed for this study
➤ Irrigation facilities	The procedure followed by Murlidhar (2008)
➤ Farm power	The scale developed by Hadole (2005)
➤ Annual income	Income from all sources per annum
➤ Credit acquisition	The procedure followed by Parganiha (2016)
➤ Material possession	The procedure followed by Guru <i>et al.</i> (2015)
Technological variables	
➤ Seed source	The schedule developed for this study
➤ Storage	The schedule developed for this study
➤ Processing and value addition	The schedule developed for this study
Communicational variables	
➤ Extension contact	The scale developed by Sawant (1999) with slight modification
➤ Mass media exposure	The scale developed by Nirban (2004)
Psychological variables	
➤ Scientific orientation	The scale developed by Supe (2007)
➤ Risk orientation	The scale developed by Supe (2007)
➤ Cosmopolitaness	The procedure followed by Yadaw (2014)
➤ Achievement motivation	The procedure followed by Shankar (2005)
➤ Economic motivation	The scale developed by Supe (2007)

-
- Awareness of turmeric growers about NHM The procedure followed by Latha (2015)
 - Attitude of turmeric growers towards NHM The scale followed by Gulkari (2011)
 - Knowledge and adoption level of turmeric growers The schedule developed for this study

Dependent variables

- Impact of National Horticulture Mission on Socio-economic status of turmeric growers. The procedure followed by Guru *et al.* (2015)
 - Productivity. The schedule developed for this study
-

3.5 Operationalization of independent variables and their measurement

3.5.1 Socio-personal characteristics

3.5.1.1 Age

It is operationally defined as the chronological age of the respondents at the time of interview. The completed years of age was considered for an individual score. The respondents according to their age were grouped into three categories, viz. young, middle and old.

Category	Score
➤ Young age (up to 35 years)	1
➤ Middle age (36 to 55 years)	2
➤ Old age (above 55 years)	3

3.5.1.2 Education

Education is operationally defined as the formal schooling completed by the respondents. A numerical score of one was assigned to each standard of formal schooling. The respondents according to their education level were categorized as mentioned below.

Category	Score
➤ Illiterate	0
➤ Primary school	1
➤ Middle school	2
➤ High school	3
➤ Higher secondary	4
➤ Graduate	5
➤ Post graduate	6

3.5.1.3 Caste

A system in which an individual is ranked on the basis of accompanying right and obligations and described on the basis of birth in to particular groups is defined caste. In this study, the castes of the respondents were categorized in following manners:

Category	Score
➤ Scheduled Castes	1
➤ Scheduled Tribes	2
➤ Other Backward Castes	3
➤ Other Castes	4

3.5.1.4 Family size

Family size refers to the total number of family members of the respondent. The respondents were categorized into following groups:

Category	Score
➤ Small (up to 4 members)	1
➤ Medium (5 to 8 members)	2
➤ Large (above 8 members)	3

3.5.1.5 Family type

A family may be nuclear or joint. Nuclear family is the social group consisting of married man and women with their children living together under the same roof and sharing a common hearth. Joint family is the social group consisting

of several related individual families, especially those of a man and his sons residing in a single large dwelling. The family type was categorized as under:-

Category	Score
➤ Nuclear	1
➤ Joint	2

3.5.1.6 Social participation

Social participation refers to the degree of involvement of the respondents in formal and informal organizations, simply as a member or an office bearer. Social participation of the respondents was calculated on the basis of the nature of participation and the number of organizations he/she participated as given below:-.

Category	Score
➤ No membership in any organization	0
➤ Membership in one organization	1
➤ Membership in more than one organization	2
➤ Office bearer	3
➤ Public leader	4

3.5.1.7 Experience in turmeric cultivation

Experience in turmeric cultivation is referred to the years of experience of an individual farmer. The experience of the farmers in completed years at the time of investigation was considered. On the basis of experience, farmers were categorized in the following manners for presentation of data:

Category	Score
➤ Low (up to 15 years)	1
➤ Medium (16 to 30 years)	2
➤ High (above 30 years)	3

3.5.1.8 House type

A building for human habitation, especially one that consists of a ground floor and one or more upper storey's the house possess by the respondents. The

scale followed by Guru *et al.* (2015) was used and the scoring was categorized as given below:-

Category	Score
➤ No house	0
➤ Hut	1
➤ Kutcha house	2
➤ Mixed house	3
➤ Pucca house	4
➤ Mansion	5

3.5.2 Socio-economic characteristics

3.5.2.1 Occupation

It refers the way of livelihood of respondents under the study. In other words, it is the act or work performed by the farmers. Farmer may not give his full attention for a single occupation i.e. Agriculture. In this study, number of occupations practiced by each respondent such as labour, caste occupation, business, independent profession, and service etc. were recorded and categorized for analysis in the following manner:

Category	Score
➤ Only Agriculture	5
➤ Agriculture + Labour	1
➤ Agriculture + Caste occupation	2
➤ Agriculture + Business	3
➤ Agriculture + Independent profession	4
➤ Agriculture + Service	6

3.5.2.2 Land holding

It was operationally defined as the total area of land in acres/ha possessed by an individual respondent at the time of investigation. The respondents were categorized in to following subheads:

Category	Score
➤ Marginal (up to 1 ha)	1
➤ Small (1.01 to 2 ha)	2
➤ Semi-medium (2.01 to 4 ha)	3
➤ Medium (4.01 to 10 ha)	4
➤ Large (10.1 and above)	5

3.5.2.3 Soil type

It is the soil type of farmers land. According to the depth and topography soils are mainly classified as Bhata (*Entisols*), Matasi (*Inceptisols*), Dorsa (*Alfisols*) and Kanhar (*Vertisols*) was categorized as under:-

Category	Score
➤ Bhata (<i>Entisols</i>)	1
➤ Matasi (<i>Inceptisols</i>)	2
➤ Dorsa (<i>Alfisols</i>)	3
➤ Kanhar (<i>Vertisols</i>)	4

3.5.2.4 Irrigation facilities

The farmers were asked to specify the availability and non-availability of irrigation sources. It refers to the source available such as canal, river, well, tube-well and pond for irrigation to the respondents. On the basis of extent of availability of irrigation, the respondents were classified as follows:

Category	Score
➤ No source	0
➤ Canal	1
➤ River	2
➤ Well	3
➤ Tube well	4
➤ Pond	5

3.5.2.5 Farm power

It refers to all assets and equipment which are required for improved farming such as the tractor, electric motor etc., which are used by the farmers. The scale developed by Hadole (2005) was used in the present study.

Category	Score
➤ No farm power	1
➤ One or two bullock	2
➤ Oil engine	3
➤ Electric motor	4
➤ Tractor	5

3.5.2.6 Annual income

Annual income of the respondents refers to the total sum amount received by all sources in a calendar year. It was measured in terms of rupees and based on annual income earned by family members from all the sources, the respondents were classified as mentioned below:-

Category	Score
➤ Up to ₹1,00,000	1
➤ ₹1,00,001 to 2,00,000	2
➤ ₹2,00,001 to 4,00,000	3
➤ ₹ 4,00,001 to 6,00,000	4
➤ Above ₹ 6,00,000	5

3.5.2.7 Credit acquisition

The availability of credit is essential to purchase the required inputs which may influence the extent of adoption among farmers. The adoption of improved agricultural technology requires more capital investment in farming to purchase the inputs like fertilizer, pesticides, improved seed, implements etc. Sources of credit were identified like (cooperative society, nationalized banks, moneylenders, friends, neighbour relatives, etc) from where they get loan and how easily they

could get it. The credit acquisition was measured on a 2 point continuum scale as follow:

Category	Score
➤ Not acquired	0
➤ Acquired	1

3.5.2.8 Material possession

Material possession means property or belongings that are tangible. This variable is measured with the help of scale followed by Guru *et al.* (2015) with slight modifications. The cumulative score was obtained for each respondents and finally, they were grouped in three categories namely 'low', 'Medium' and 'high' considering the mean and standard deviation.

Category	Score
➤ Bullock cart	1
➤ Cycle	2
➤ Radio	3
➤ Chairs	4
➤ Mobile phone	5
➤ Television	6
➤ Refrigerators	7

The scoring procedure is as follows.

Level of material possession	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.3 Technological variables

3.5.3.1 Seed source

A seed source refers to the place or agency from where the farmers get the seed material for planting. The quantification of this variable was done by assigning scores in the following manner.

Category	Score
➤ Owned	1
➤ NHM office	2
➤ Market	3

3.5.3.2 Storage

Storage refers to the act of depositing in a store or warehouse for safe keeping; also, the safe keeping of goods in a warehouse. Storage facilities of farmers are forced to sell their produce to money lenders under distress conditions. Rhizomes of turmeric are stored by farmers is mainly for 3 purposes, i.e. for home consumption, seed purpose (used for sowing in next season crop) and for sell.

Category	Score
➤ Ventilated room	1
➤ Gunny bag	2

3.5.3.3 Processing and value addition

The harvested turmeric rhizomes before entering into the market is converted into a stable commodity through a number of post harvest processing operations like boiling, drying and polishing. Boiling of turmeric is taken up within 3 or 4 days after harvest. The fingers and bulbs (or mother rhizomes) are separated and are cured separately, since the latter take a little longer to cook.

Category	Score
➤ Curing	1
➤ Boiling	2
➤ Drying	3
➤ Grading	4
➤ Grinding	5

3.5.4 Communicational characteristics

3.5.4.1 Extension contact

Extension contact was operationalized as the awareness of the respondents about various extension agencies and their regularity of contact with the same to acquire information or advice to agriculture in general. The measurement of this variable was based on the procedure as followed by Sawant (1999) with slight modification.

The score of 2 for regular, 1 for occasional and 0 for never was assigned for each extension contact and thus the possible score that could be obtained by the respondents.

Category	Score
Awareness	
➤ No	0
➤ Yes	1
Regularity of contact	
➤ Never	0
➤ Some time	1
➤ Regular	2

Depending upon the total score, the respondents were divided into three categories on the basis of mean and standard deviation as under:-

Level of extension contact	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.4.2 Mass media exposure

It refers to the utilization of or exposure to different mass media sources by the respondents and was ascertained by giving the score of 2, 1 and 0 to those who were exposed to mass media on the rating of ‘always’, ‘sometimes’ and ‘never’, respectively. The procedure as followed by Nirban (2004) with slight modification was used to measure the mass media exposure of the respondents as given below:-

Category	Score
➤ Never	0
➤ Some time	1
➤ Regular	2

Depending upon the total score, the respondents were divided into three categories on the basis of using following formula:

Level of mass media exposure	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.5 Psychological characteristics

3.5.5.1 Scientific orientation

It is the degree to which a farmer is oriented to the use of scientific methods in decision making and farming. This scale is measured with the help of scale developed by Supe (2007). This scale considered following six items. First five statements are positive and statement number six is negative. The response are to be recorded on five point continuum ranking from strongly agree to strongly disagree. This scoring procedure used is as follows:

Particulars	Response				
	SA	A	UD	DA	SDA
➤ Score for positive statement	5	4	3	2	1
➤ Score for negative statement	1	2	3	4	5

Considering the scientific orientation score of the respondents, they can be grouped into three categories namely 'low', 'medium' and 'high' by using mean and standard deviation.

Level of scientific orientation	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.5.2 Risk orientation

It is the degree to which a farmer is oriented towards risk uncertainty and has courage to face the problems in farming.

This variable is measured with the help of scale developed by Supe (2007). This variable considered of six statements. First four statements are positive and two (no. 5 and 6) statements are negative. The respondents are to be recorded on five point continuum ranging from strongly agree to strongly disagree. The scoring procedure used is as follows:

Particulars	Response				
	SA	A	UD	DA	SDA
➤ Score for positive statement	5	4	3	2	1
➤ Score for negative statement	1	2	3	4	5

Considering the risk orientation score of the respondents, they can be grouped into three categories namely 'low', 'medium' and 'high' by using mean and standard deviation.

Level of risk orientation	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.5.3 Cosmopolitanness

Cosmopolitanness is the tendency of an individual to be in contact with outside from his own community based on the belief that all the needs of an individual cannot be satisfied within his own community.

To measure cosmopolitanness of respondents, they were asked to indicate their extent to contact with outside to their social system by their own efforts. The procedure followed by Yadaw (2014) was used. The respondents were grouped in to four categories in following manners:

Category	Score
➤ Never	0
➤ Once in a month	1
➤ Once in a week	2
➤ Twice or more in a week	3

3.5.5.4 Achievement motivation

It was operationalized as the desire for excellence to attain a sense of personal accomplishment. It was measured with the help of procedure followed by Shankar (2005).

The instrument consisted of six statements in the form of questions. Each statement has three alternative answer (agree, undecided and disagree). The respondents have to tick one of the alternatives to each statement. The questions 1, 2 and 6 classified as, positive statements were scored as 3, 2 and 1. The scoring is reverse for other selected negative statements.

Category	Response		
	Agree	Undecided	Disagree
➤ Score of positive statement	3	2	1
➤ Score of negative statement	1	2	3

Based on the total score obtained by respondents on achievement motivation, they were grouped into the following three categories, keeping the mean and standard deviation as check.

Level of achievement motivation	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.5.5 Economic motivation

It is defined as the occupational success in terms of profits of maximization and the relative value placed by a farmer on economic ends.

This variable is measured with the help of scale developed by Supe (2007). This scale considered following six items. First five statements are positive and statement number six is negative. The responses are to be recorded on five point continuum ranging from strongly agree to strongly disagree. The scoring procedure used is as follows.

Particulars	Response				
	SA	A	UD	DA	SDA
➤ Score for positive statement	5	4	3	2	1
➤ Score for negative statement	1	2	3	4	5

Considering the economic orientation score of the respondents, they can be grouped into three categories namely 'low', 'medium' and 'high' by using mean and standard deviation.

Level of economic motivation	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.6 Awareness about NHM

Awareness refers to the first hand information obtained by the respondents about the existence of “National Horticulture Mission” scheme, its activity, its implementation, or its operational procedure. Awareness is very much essential, because it motivates an individual to obtain further information and to take action. It is the first step in the process of adoption. A schedule was developed to gauge the awareness of the respondents regarding “National Horticulture Mission” scheme. The statements were with dichotomous choice as, “aware” and “not aware”. If the respondents were aware about the items a score of “1” was given and if not aware a score of “0” was given accordingly. The total score of each respondent was computed.

Mean per cent score (MPS)

Based on the total scores obtained by the respondents, awareness mean score was worked out by using the following formula:

$$\text{MPS} = \frac{\text{Total obtained score}}{\text{Maximum obtainable score}} \times 100$$

The mean score of each aspect was calculated to find out aspect wise difference in awareness between beneficiaries and non-beneficiaries respondents. The awareness scores of each statement were added together, mean and standard deviation value, the awareness level of the respondents was categorized as follows:

Level of awareness	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean ± S.D.
➤ High	Above Mean + S.D.

3.5.7 Attitude towards NHM

Attitude refers to the “degree of positive or negative feeling associated with some psychological object”. In present study, attitude was conceptualized as positive or negative reaction/feeling of farmers towards National Horticulture Mission.

The responses can be collected on five point quantinum viz. strongly agree, agree, undecided, disagree and strongly disagree with respective weights of 5, 4, 3, 2 and 1 for the favorable statements and with the respective weights of 1, 2, 3, 4 and 5 for the unfavorable statements. The procedure followed by Gulkari (2011) with slight modification.

Particulars	Response				
	SA	A	UD	DA	SDA
➤ Score for positive statement	5	4	3	2	1
➤ Score for negative statement	1	2	3	4	5

The attitude of the respondents towards National Horticulture Mission was categorized into five categories by using arbitrary method with maximum score 60

and minimum score 12 and the range or interval between two categories was worked out as under:

$$\text{Interval between two categories} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of categories}}$$

The respondents were categorised into five categories namely most unfavourable, unfavourable, neutral, favourable and most favourable as below.

Category	Score
➤ Most unfavourable (up to 21.60 score)	1
➤ Unfavourable (21.60 to 31.20 score)	2
➤ Neutral (31.20 to 40.80 score)	3
➤ Favourable (40.81 to 50.40 score)	4
➤ Most favourable (above 50.41 score)	5

3.5.8 Knowledge about turmeric cultivation

Rogers (1983) stated that knowledge is of three types namely awareness knowledge, how to knowledge and principle knowledge. In the present study awareness knowledge was studied and the study was confined, to the technical information possessed by the respondents about turmeric growers. The same was measured by constructing a teacher made knowledge test.

It referred to the body of information possessed by the respondents about improved turmeric cultivation practices considered in the study and which was emphasized either by remembering/recognition or by recall. The set of questions developed were discussed with the subject matter specialists in different disciplines who were members of advisory committee. For the test of knowledge, 16 practices of turmeric cultivation were selected for the present study. The weightage of 2 for full knowledge, 1 for partial knowledge and 0 for no knowledge were assigned for each practice. The total score obtained by the respondents from all 16 practices was the knowledge score of the individual respondent.

The respondents were classified into three categories *viz.* low, medium and high level of knowledge on the basis of mean and standard deviation.

Level of knowledge	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.5.9 Adoption regarding turmeric cultivation

It is mental process through which an individual passes from hearing about an innovation to final adoption (Rogers, 1995).

It was operationalized as the degree of the use of cultivation practices. Adoption refers to the extent of use of cultivation practices of turmeric by the turmeric growers. To measure the adoption level of turmeric growers a schedule was prepared with 16 practices of turmeric cultivation for the present study. The weightage of 2 for fully adopted, 1 for partially adopted and 0 for not adopted were assigned for each practice. The total score obtained by the respondents from all 16 practices was the adoption score of the individual respondent.

The respondents were classified into three categories *viz.* low, medium and high level of adoption on the basis of mean and S.D.

Level of adoption	Criteria
➤ Low	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ High	Above Mean + S.D.

3.6 Operationalization of dependent variables and its measurement

3.6.1 Impact of NHM on socio-economic status of turmeric growers

The position of the respondent in the society is termed as socio-economic status, which is determined by various social and economic variables, *viz.* caste, occupation, education, land, social participation, house, farm power, material possession and family type. The scale followed by Guru *et al.* (2015) with slight modifications. After filling the information-blank, and scoring the individual items, the total score is summed up. With the help of the key provided in the manual, score is interpreted in terms of the class.

Category	Score
➤ Lower class (up to 12 score)	1
➤ Lower middle class (13 to 23 score)	2
➤ Middle class (24 to 32 score)	3
➤ Upper middle class (33 to 42 score)	4
➤ Upper class (above 42 score)	5

Further, the test of significance of difference between two mean was carried out. Thus, 'Z' test was used due to large sample size to compare the impact of NHM on socio-economic status of beneficiaries and non-beneficiaries respondents.

The 'Z' value of difference between the mean score of two samples was found to be significant at 0.01 level of probability. Hence, there was significant difference between mean score of both groups.

3.6.2 Impact of NHM on productivity of turmeric

The farmers were asked to give the total yield of turmeric crop and same was worked out per hectare considering area under turmeric crop. According to the productivity of turmeric were classified into three categories.

Category	Score
➤ Up to 150 q ha ⁻¹	1
➤ 151 to 200 q ha ⁻¹	2
➤ Above 200 q ha ⁻¹	3

Further, the test of significance of difference between two mean was carried out. Thus, 'Z' test was used due to large sample size to compare the impact of NHM on productivity of turmeric with respect to beneficiaries and non-beneficiaries respondents.

3.6.3 Impact of NHM on area under turmeric cultivation

It is the actual area of land brought under turmeric crop during the sample year by the respondents. According to the area under turmeric crop of the respondents were classified into three categories.

Category	Criteria
➤ Small	Below Mean – S.D.
➤ Medium	Between Mean \pm S.D.
➤ Large	Above Mean + S.D.

Further, the test of significance of difference between two mean was carried out. Thus, ‘Z’ test was used due to large sample size to compare the impact of NHM on area under turmeric of beneficiaries and non-beneficiaries respondents.

3.7 Derivation of Hypothesis

A hypothesis is a tentative supposition or provisional guess which seems to explain the situation under observation. It is an assumption or proposition whose tenability is to be tested on the basis of the compatibility of its implications with empirical evidence and with precious knowledge.

Daivadeenam and Somani (2013)

Relevant null hypothesis were formulated on the basis of literature review and objectives of the study as follows:

H₀ (1): There is no difference between socio-economic status of beneficiaries and non- beneficiaries respondents.

H₀ (2): There is no difference between productivity of turmeric among the beneficiaries and non-beneficiaries respondents.

H₀ (3): There is no difference between independent and dependent variables selected for this study.

3.8 Conceptual model of the study

Conceptually the variables under the study are presented in Fig. 3.2. It is conceived that the dependent variables socio-economic status and productivity were influenced by the independent variables age, education, caste, family size, family type, social participation, experience in turmeric cultivation, house type, occupation, land holding, soil type, irrigation, farm power, annual income, credit acquisition, material possession, seed source, storage, processing and value

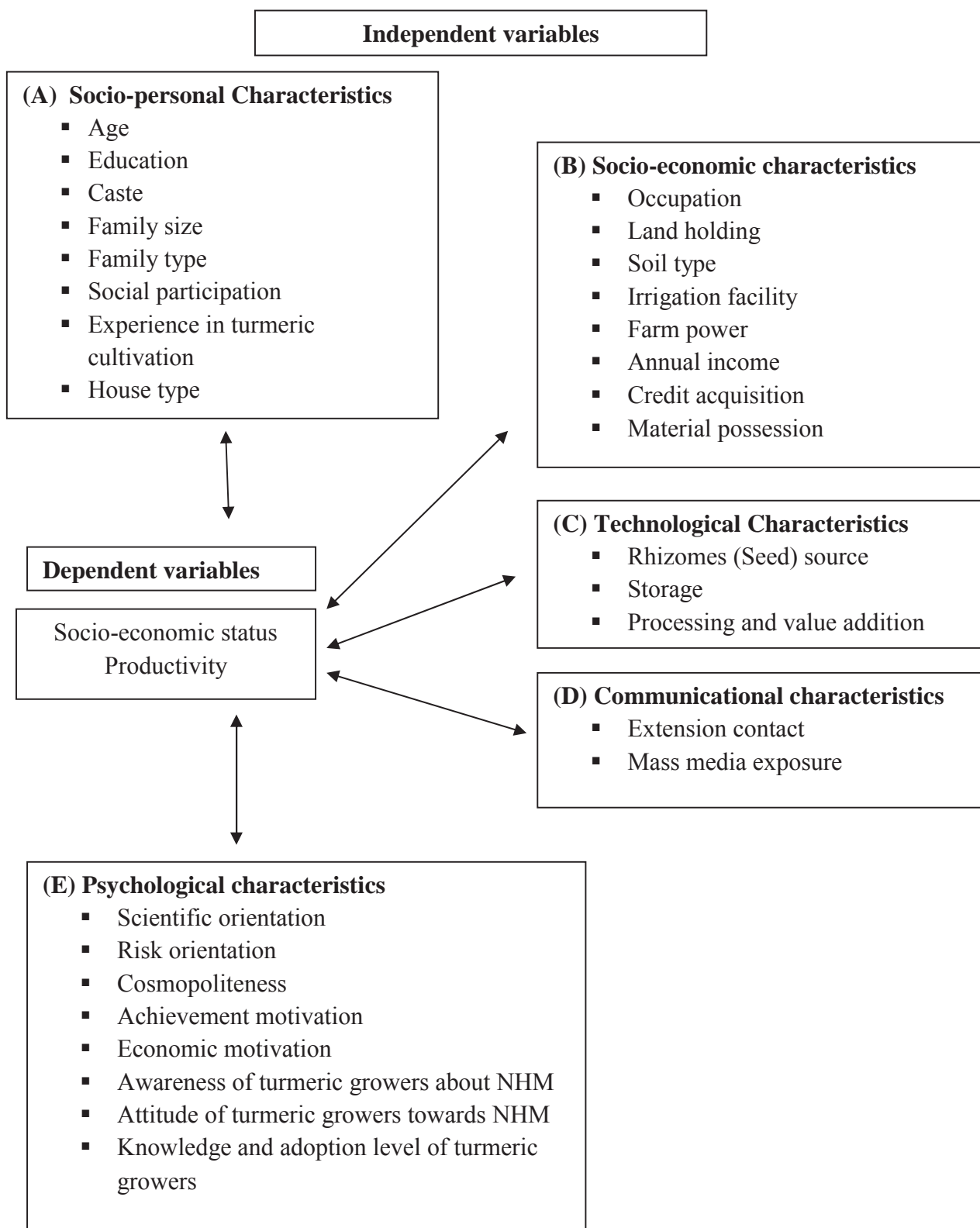


Fig. 3.2: Conceptual model of the study

addition, extension contact, mass media exposure, scientific orientation, risk orientation, cosmopolitaness, achievement motivation, economic motivation, awareness about NHM, attitude towards NHM, knowledge and adoption level of turmeric cultivation.

3.9 Constraints faced by the turmeric growers in adoption of turmeric cultivation

Constraints imply forcible restriction and confinement of action. In this study constraints mean “Impediment” in the adoption of improved turmeric cultivation practices.

Further, the various constraints given by the respondents were listed and ranked accordingly. The constraints obtained were summed up and ranked accordingly on the basis of number and per cent.

3.10 Suggestions obtained by the turmeric growers to overcome the constraints in adoption of turmeric cultivation

Considering the problems faced by the turmeric growers during adoption of improved turmeric cultivation practices and to overcome the same, the farmers were asked to give their valuable suggestions. The suggestions obtained were summed up and ranked accordingly on the basis of number and per cent.

3.11 Type of data

The data pertaining to selected characteristics about socio-personal, socio-economic, socio-psychological, communication, adoption, problems perceived in terms of adoption and suggestions of respondents were collected as per objectives of the study as primary data. The official information and records were also consulted from the concerning departments as secondary data.

3.12 Developing the interview schedule

The interview schedule was designed on the basis of objectives and independent and dependent variables in the present investigation. To facilitate the respondents, the interview schedule was framed in “Hindi”. Each question was thoroughly examined and discussed with the experts before presenting the

interview schedule. Adequate precautions and care were taken into consideration to formulate the questions in a manner that they were well understood by the respondents and would find it easier to respond.

The prepared interview schedule was used in the study area for collecting the data. On the basis of experience gained in pre-testing, the necessary modifications and suggestions were incorporated before giving a final touch to interview schedule.

3.13 Validity

Validity refers to “the degree to which the data collection instruments measure what it is supposed to measure rather than something else”. Taking the following steps validity of interview schedule used for this study was maximized:

1. The interview schedule was thoroughly discussed with the scientists and their suggestions were incorporated.
2. Pre-testing of interview schedule provided an additional check for improving the instruments.
3. The relevancy of each question in terms of objectives of study, logical order and wording of each question were checked carefully.

3.14 Reliability

Reliability of an interview schedule refers to “its consistency or stability in obtaining information from the respondents”.

The test-retest method of estimating reliability of an interview schedule was followed in this study. Thirty respondents of the study area were randomly selected and were re-interviewed after one week using the same interview schedule followed at the time of first interview. Since same responses were observed, the reliability of the interview schedule was ensured.

3.15 Method of data collection

Data were collected interviewed through personal interview by using the pretested interview schedule. Prior to interview, respondents were taken into confidence by revealing the actual purpose of the study and also full care was taken to develop good rapport with them. They were assured that the information

given by them would be kept confidential. The interview was conducted in the most formal and friendly atmosphere without any complications.

3.16 Data processing and statistical tools used for analysis of data

The data collected during the course of investigation was tabulated into the coding sheet and then appropriate analysis of data was made according to the objectives as suggested by Cochran and Cox (1957). The statistics applied were percentage, frequency, mean, standard deviation, coefficient of correlation, multiple regression etc.

3.16.1 Frequency and percentage

Frequency and percentage were used for making simple comparison. The frequency of the particular category was multiplied into hundred and divide by total number of respondents to get percentage in that particular category.

3.16.2 Mean, standard deviation and rank

(i) Mean

Mean of sample was calculated by using the following formula:

$$\bar{x} = \frac{\sum x}{n}$$

Where, \bar{x} = Mean

$\sum x$ = Sum of all items

n = Number of items

(ii) Standard deviation

Standard deviation was calculated by using following formula:

$$\sigma = \sqrt{1/n \left[\sum x^2 - \frac{(\sum x)^2}{n} \right]}$$

Where, σ = Standard deviation

x = Deviation obtained from mean

n = Number of items

$\sum x^2$ = Sum of squares of all items

$(\sum x)$ = Square of summation of all items

(iii) Rank

After arranging the data according to the measurement either in ascending order or descending order. The data were reassigned the values 1 to n. wherever ties occur the value were assigned considering the simple arithmetic mean.

3.16.3 Mean per cent score (MPS)

Mean per cent score were obtained by multiplying total score of the respondents multiplied by hundred and dividing by the maximum obtainable score under each practice, formula is as given under:

$$\text{MPS} = \frac{\text{Total obtained score}}{\text{Maximum obtainable score}} \times 100$$

Mean per cent score was used to determine level of awareness and attitude. It was also used for giving ranks to various aspects of awareness and attitude.

3.16.4 Per cent change in selected parameters

The socio-economic status, productivity and area of turmeric were estimated for both beneficiaries and non-beneficiaries respondents. The impact of NHM was analyzed by working out per cent change with following expression:

$$\text{Per cent change} = \frac{X_1 - X_2}{X_2} \times 100$$

Where, X_1 = Value of parameter under beneficiaries

X_2 = Value of parameter under non-beneficiaries

3.16.5 Fishers 'Z' test

Z-test was used to the significance of deference between two means of beneficiaries and non-beneficiaries as the sample is larger than 30.

The Z test equitation is as follows:

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{S_1^2/n_1 + S_2^2/n_2}}$$

Where, \bar{X}_1 = First sample mean

\bar{X}_2 = Second sample mean

S_1^2 = First sample variance

S_2^2 = Second sample variance

n_1 = First sample size

n_2 = Second sample size

3.16.6 Correlation Co-efficient (r)

This technique was used to find out the significant relationship, if any between scores of the independent variables and the scores of the dependent variables of the sample respondents who are cultivating turmeric crop the following formula for assessment of correlation co-efficient was used:-

$$r = \frac{\sum xy - \frac{\sum(x)\sum(y)}{n}}{\sqrt{\left[\sum x^2 - \frac{(\sum x)^2}{n} \right] \left[\sum y^2 - \frac{(\sum y)^2}{n} \right]}}$$

Where, r = Correlation coefficient

n = Number of the respondents

$\sum x$ = Sum of score of independent variables

$\sum y$ = Sum of score of dependent variables

$\sum x^2$ = Sum of square of scores of independent variables

$\sum y^2$ = Sum of square of score of dependent variables

$\sum xy$ = Sum of scores of independent variables multiplied by the scores of dependent variables

The computed 'r' values were then compared with table values and coefficient of correlation at 1 and 5 per cent level of significance was tested.

3.16.7 Multiple regressions analysis

Multiple regression provides an analysis of the relations among two or more predictor variables and the single criterion variable Y. The regression coefficient b_x may be interpreted as the change in Y corresponding to a unit increase in x_1 when all the other variables are held constant. The multiple regression coefficient 'R' is the highest possible correlation between least square

of the independent variables and the observed dependent variables and R^2 is the portion of the variance in the criterion variable.

The regression equation may be written as:

$$Y = a + b_1x_1 + b_2x_2 + \dots + b_nx_n$$

Where, Y = Dependent variable

a = Intercept (constant value)

$b_1 \dots b_n$ = The partial regression coefficient represents the amount of change in Y can be associated with a unit change in x_1 the remaining independent variables held constant

$x_1 \dots x_n$ = Independent variables

3.17 Operationization of the terms used in the study

3.17.1 Schedule: The schedule is the form, containing some questions or blank tables which are to be filled in by the researcher/worker after getting response from the respondents.

3.17.2 Beneficiaries: Those respondents who have been benefited from the National Horticulture Mission Scheme.

3.17.3 Non-beneficiaries: Those respondents who have been not benefited from the National Horticulture Mission Scheme.

3.17.4 Null hypothesis: A null hypothesis may state that there is no significance difference or association between variables.

3.17.5 Level of significance: The probability of committing type first error is known as the level of significance.

3.17.6 Variable: A variable is a symbol to which we used to assign numerical values.

3.17.7 Dependent variable: The dependent variable is the condition or characteristics that disappears or change due to change in magnitude of independent variable. The dependent variable is the presumed effect and is predict from the independent one.

3.17.8 Independent variable: Independent variable is the condition or characteristics that the researcher manipulates to ascertain their relationship to the absorb phenomena. An independent variable is the presumed cause of the dependent variables.

3.17.9 Impact: This refers to the force, impression or operations of one thing on another, affect a forceful control and collusion. In simple words, it is the effect of one on the another.

3.17.10 Socio-economic status: It is the position that an individual or family occupies with reference to prevailing average standard of cultural possession, effective income, material possession and participation in group activities of the community.

3.17.11 Productivity: It is operationally defined as the “total yield per hectare obtained by the respondents from a single piece of land.

3.17.12 Age: The number of years that the respondents had completed at the time of investigation was considered.

3.17.13 Education: It refers to the extent of formal education successfully attained by the respondents.

3.17.14 Caste: It is a class gained by birth, caste has been operationalized as a social corsetry whose members are assigned a permanent status within a given social hierarchy and whose contents are restricted accordingly.

3.17.15 Family size: It refers to the total number of members in the family of the respondents.

3.17.16 Family type: Family type was studied as nuclear and joint family. In the present study, nuclear family means husband, wife and their unmarried children living together. The join family means more than one nuclear family living togher.

3.17.17 Social participation: It refers to the degree to which the respondent is involved in formal, social and political organizations as member or office bearer or their involvement in community.

3.17.18 Farming experience: It was operationalized as number of completed years of experience in farming by the respondent at the time of investigation.

3.17.19 House type: A building for human habitation, especially one that consists of a ground floor and one or more upper storey's the house possess by the respondents.

3.17.20 Occupation: It refers to the means of earning for livelihood, it may be farming (cultivation), business and service etc.

3.17.21 Land holding: Total land (irrigated and unirrigated) in the hectare/acre possessed by a farmer was consider as a size of land holding.

3.17.22 Irrigation facilities: It refers to the number of irrigation sources available to the farmers to irrigate the turmeric crop.

3.17.23 Farm power: It refers to the animal power, mechanical power and farm implements possessed by the respondents.

3.17.24 Annual income: It is the total annual income earning by an individual from various sources of its livelihood.

3.17.25 Credit acquisition: It had been defined as from which institution the respondents take loan for setting inventures of self-employment.

3.17.26 Material possession: Material possession means property or belongings that are tangible.

3.17.27 Extension contact: The extension contact indicates the acquaintance as well as the frequency of contact with different extension agency, viz. RHEO, SHDO and Scientist etc.

3.17.28 Mass media exposure: Mass media exposure was operationalized as the frequently of exposure or the use of different media by the respondents viz. radio, T.V. news papers, farm magazines etc. for getting information about their turmeric cultivation.

3.17.29 Scientific orientation: It is the degree to which a farmer is oriented to the use of scientific methods in decision making and farming.

3.17.30 Risk orientation: It is the degree to which a farmer is oriented towards risk uncertainty and has courage to face the problems in farming.

3.17.31 Cosmopolitaness: It is the tendency of an individual to be in contact with outside from his own community based on the belief that all the needs of an individual cannot be satisfied within his own community.

3.17.32 Achievement motivation: It has been defined as the desire to excel regardless of social rewards.

3.17.33 Economic motivation: It is defined as the occupational success in terms of profits of maximization and the relative value placed by a farmer on economic ends.

3.17.34 Awareness: It refers to the first hand information obtained by the respondents about the existence of “National Horticulture Mission” scheme, its activity, its implementation, or its operational procedure.

3.17.35 Attitude towards NHM: It refers to the “degree of positive or negative feeling associated with some psychological object”. In present study, attitude was conceptualized as positive or negative reaction/feeling of farmers towards National Horticulture Mission.

3.17.36 Knowledge: It is the body of understood information about improved cultivation practices possessed by the farmers with regards to turmeric cultivation.

3.17.37 Adoption: It refers to the actual use of improved cultivation practices of turmeric by the respondents.

3.17.38 Constraints: It refers to the difficulty faced by the farmers in adoption of improved turmeric cultivation practices.

CHAPTER – IV

RESULTS AND DISCUSSION

This chapter presents the objectives wise findings of the study. Keeping in view of the objectives of the study, information was collected from the respondents, classified, tabulated, analyzed and presented in a systematic way under the following heads:

4.1 Independent variables

4.1.1 Socio-personal characteristics of the respondents

4.1.2 Socio-economic characteristics of the respondents

4.1.3 Technological characteristics of the respondents

4.1.4 Communicational characteristics of the respondents

4.1.5 Psychological characteristics of the respondents

4.2 Awareness of turmeric growers about NHM

4.3 Attitude of turmeric growers towards NHM

4.4 Knowledge level of turmeric growers

4.5 Adoption level of turmeric growers

4.6 Comparison of selected socio-economic characteristics of beneficiaries and non-beneficiaries respondents

4.7 Existing cultivation practices of turmeric by the turmeric growers

4.8 Benefits received by the beneficiaries under NHM

4.9 Dependents variables

4.10 Relationship between independent and dependent variables

4.11 Multiple regression analysis

4.12 Constraints and suggestions

4.1 Independent variables

4.1.1 Socio-personal characteristics of the respondents

Age, education, caste, family size, family type, social participation, experience in turmeric cultivation and house type of the turmeric growers were

considered as socio-personal characteristics of the respondents. These characteristics were analyzed and presented in the following sections.

4.1.1.1 Age

The data presented in Table 4.1 depicts the percentage distribution of the respondents according to their age. It indicates that out of total respondents, 58.75 per cent belonged to middle age group, followed by 24.38 per cent belonged to old age group and 16.87 per cent belonged to young age group.

Table 4.1: Distribution of the respondents according to their age

Sl. No.	Age (years)	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Young (up to 35 years)	22	13.75	32	20.00	54	16.87
2	Middle (36 to 55 years)	96	60.00	92	57.50	188	58.75
3	Old (above 55 years)	42	26.25	36	22.50	78	24.38
Total		160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, 60.00 per cent belonged to middle age group, while 26.25 per cent belonged to old age group and 13.75 per cent belonged to young age group.

Similarly, in case of non-beneficiaries, 57.50 per cent belonged to middle age group, whereas 22.50 per cent belonged to old age group and 20.00 per cent belonged to young age group.

From the above fact, it can be concluded that majority of the respondents from both the groups belonged to middle age group.

The probable reason might be that too young people might be busy with their study and too old people might not be able to do agriculture practices and the middle age is considered as an active working age and have responsibility for earning for their families. They can accept changes earlier as compare to old age group.

This observation is in line with the findings of Khalache *et al.* (2012), Dhalpe and Dawane (2016) and Roy *et al.* (2013).

4.1.1.2 Education

The data presented in Table 4.2 and Fig. 4.1 indicated that out of total respondents, 27.81 per cent were educated up to primary school level, followed by middle school (25.94%), higher secondary (13.44%), illiterate (11.56%), high school (10.31%), graduate (7.81%) and post-graduates (3.13%).

Table 4.2: Distribution of the respondents according to their education

Sl. No.	Education level	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Illiterate	16	10.00	21	13.12	37	11.56
2	Primary school	42	26.25	47	29.38	89	27.81
3	Middle school	43	26.87	40	25.00	83	25.94
4	High school	15	9.38	18	11.25	33	10.31
5	Higher secondary	23	14.37	20	12.50	43	13.44
6	Graduate	13	8.13	12	7.50	25	7.81
7	Post-graduate	8	5.00	2	1.25	10	3.13
Total		160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, most of the respondents (26.87%) were educated up to middle school, followed by primary school (26.25%), higher secondary (14.37%), illiterate (10.00%), high school (9.38%), graduate (8.13%) and post-graduate (5.00%).

Similarly, in case of non-beneficiaries, 29.38 per cent of the respondents were educated up to primary school, whereas middle school (25.00%), illiterate (13.12%), higher secondary (12.50%), high school (11.25%), graduate (7.50%) and post-graduate (1.25%).

Generally, the villages are having the educational facility upto primary and higher secondary and for getting higher studies one has to go to cities which give rise to different problems. This clearly indicates that the large proportion of the beneficiaries and non-beneficiaries respondents had upto primary to middle school level education in the study area.

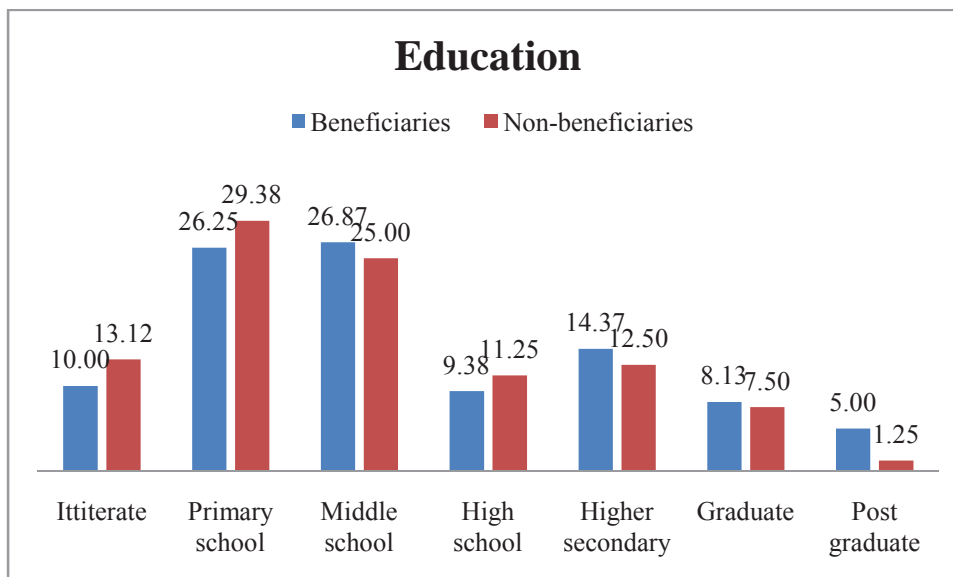


Fig. 4.1: Distribution of the respondents according to their education level

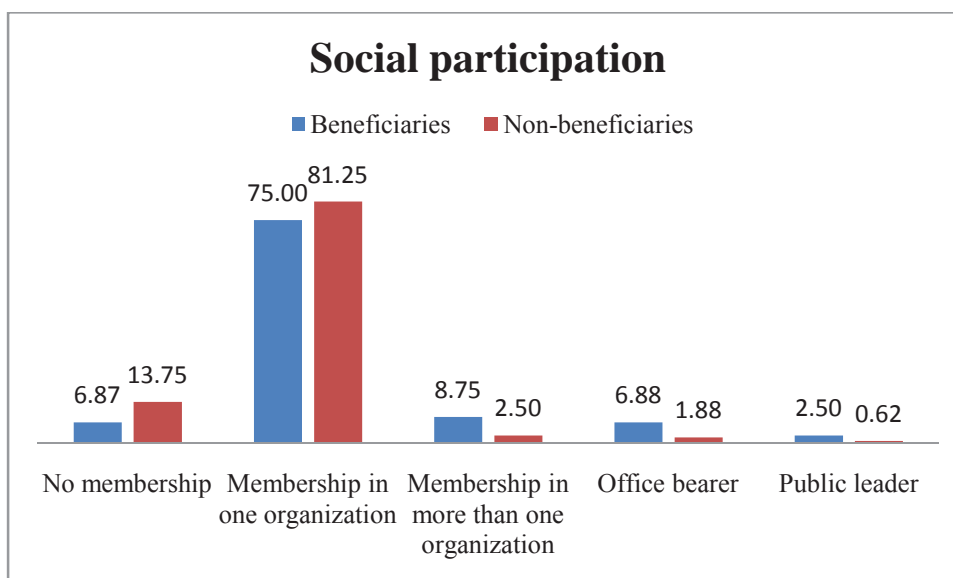


Fig. 4.2: Distribution of the respondents according to their social participation

This is in conformity with the results by Das and Puzari (2010), Fartyal and Rathore (2014) and Singh (2014).

4.1.1.3 Caste

The data presented in Table 4.3 reveals that out of total, most of the respondents (40.00%) belonged to other backward castes, followed by 35.31 per cent scheduled tribes, whereas 17.50 per cent from other castes and 7.19 per cent from scheduled castes categories.

Table 4.3: Distribution of the respondents according to their caste

Sl. No.	Caste	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Scheduled Castes	14	8.75	9	5.62	23	7.19
2	Scheduled Tribes	58	36.25	55	34.38	113	35.31
3	Other Backward Castes	59	36.88	69	43.12	128	40.00
4	Other castes	29	18.12	27	16.88	56	17.50
Total		160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, 36.88 per cent of the respondents belonged to other backward castes, while 36.25 per cent scheduled tribes and 18.13 per cent other castes. About 8.75 per cent belonged to scheduled castes category.

Similarly, in case of non-beneficiaries, 43.12 per cent of the respondents belonged to other backward castes, followed by 34.38 per cent scheduled tribes and 16.88 per cent other castes. About 5.62 per cent belonged to scheduled castes category.

The above findings reveal that the majority of both the beneficiaries and non-beneficiaries respondents belonged to the other backward class.

This is attributed to the fact that the study area was dominated by other backward community. Hence, majority of the beneficiaries and non-beneficiaries respondents belongs to other backward class.

The result is in accordance with the results of Seemaprakalpa (2016), Verma *et al.* (2014) and Roy *et al.* (2013).

4.1.1.4 Family size

The data given in Table 4.4 indicates that out of total, 39.69 per cent of the respondents had medium family size, followed by 35.31 per cent large and 25.00 per cent had small size of family.

In case of beneficiaries, 40.62 per cent of the respondents had large family size, while 37.50 per cent medium size and 21.88 per cent small size of family.

Similarly, in case of non-beneficiaries, 41.88 per cent of the respondents had medium family size, followed by 30.00 per cent large size and 28.12 per cent small size of family.

Table 4.4: Distribution of the respondents according to their family size

Sl. No.	Family size	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Small (up to 4 members)	35	21.88	45	28.12	80	25.00
2	Medium (5 to 8 members)	60	37.50	67	41.88	127	39.69
3	Large (above 8 members)	65	40.62	48	30.00	113	35.31
Total		160	100	160	100	320	100

F – Frequency, % - percentage

It can be concluded that majority of the beneficiaries and non-beneficiaries respondents had medium size of family having 5 to 8 members.

The lack of awareness about family planning, population explosion and belief in taboo of large family more the bread earning members resulted in a medium and large family size in majority of the respondents.

This finding was in agreement with the findings of Khalache *et al.* (2012), Gamanagatti and Dodamani (2016) and Seemaprakalpa (2016).

4.1.1.5 Family type

The data presented in Table 4.5 reveals that out of the total, majority of the respondents (51.56%) belonged to joint family and 48.44 per cent belonged to nuclear family.

Table 4.5: Distribution of the respondents according to their family type

Sl. No.	Family type	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Nuclear	66	41.25	89	55.62	155	48.44
2	Joint	94	58.75	71	44.38	165	51.56
	Total	160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, majority of the respondents (58.75%) belonged to joint family and 41.25 per cent of the respondents belonged to nuclear family.

Similarly, in case of non-beneficiaries, 55.62 per cent of the respondents belonged to nuclear family and 44.38 per cent belonged to joint family.

It can be concluded that majority of the beneficiaries respondents belonged to joint family and non-beneficiaries respondents are belonging to the nuclear family.

The reason for joint family system among the rural area is because of sharing the family responsibility and work. It is a usual practice among the rural area that after marriage son lives in the family with his wife and children and staying in the same house. The son and his family maintained all the household expenses. They share the same roof.

This might be due to the large number of joint families. They decide to remain jointly because they feel that sharing property would be uneconomical for them.

This results in line with the findings of Das and Puzari (2010), Gamanagatti and Dodamani (2016) and Seemaprakalpa (2016).

4.1.1.6 Social participation

The data presented in Table 4.6 and Fig. 4.2 reveals that out of the total respondents, 78.13 per cent had membership in one organization, followed by 10.31 per cent had no membership in any organization, whereas 5.62 per cent had membership in more than one organization and 4.38 per cent had office bearer. About 1.56 per cent had public leader.

Table 4.6: Distribution of the respondents according to their social participation

Sl. No.	Social participation	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	No membership in any organization	11	6.87	22	13.75	33	10.31
2	Membership in one organization	120	75.00	130	81.25	250	78.13
3	Membership in more than one organization	14	8.75	4	2.50	18	5.62
4	Office bearer	11	6.88	3	1.88	14	4.38
5	Public leader	4	2.50	1	0.62	5	1.56
	Total	160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, most of the respondents (75.00 %) had membership in one organization, followed by 8.75 per cent respondents had membership in more than one organization, while 6.88 per cent respondents had office bearer and 6.87 per cent had no membership in any organization. About 2.50 per cent involved in public leader.

Similarly, in case of non beneficiaries, majority of the respondents (81.25%) were had membership in one organization, followed by 13.75 per cent respondents did not involved in any organization, while 2.50 per cent respondents involved in more than one organization and 1.88 per cent office bearer. About 0.62 per cent involved in public leader.

It can be concluded that majority of the beneficiaries and non-beneficiaries respondents had participation in one social organization.

The possible reason might be that beneficiaries and non-beneficiaries respondents were busy in their home management, child care and farming activities and have little time for different social organization. They participate only when it is important on the basis of their interest or when they face problem.

This result corroborates with the findings of Shukla and Sharma (2010), Deshmukh *et al.* (2011), Verma *et al.* (2014) and Singh *et al.* (2009).

4.1.1.7 Experience in turmeric cultivation

The data given in Table 4.7 reveals that out of the total respondents, 40.62 per cent had medium experience between 16 to 30 years in turmeric cultivation, followed by 30.32 per cent low and 29.06 per cent high farming experience, respectively.

Table 4.7: Distribution of the respondents according to their experience in turmeric cultivation

Sl. No.	Experience (years)	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low (up to 15 years)	55	34.37	42	26.25	97	30.32
2	Medium (16 to 30 years)	67	41.88	63	39.38	130	40.62
3	High (above 30 years)	38	23.75	55	34.37	93	29.06
Total		160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, 41.88 per cent of the respondents belonged to medium level experience in turmeric cultivation between 16 to 30 years, followed by 34.37 per cent low turmeric cultivation experience up to 15 years and 23.75 per cent high turmeric cultivation experience above 30 years.

Similarly, in case of non-beneficiaries, 39.38 per cent belonged to medium turmeric cultivation experience between 16 to 30years, while 34.38 per cent had high and 26.25 per cent had low turmeric cultivation experience, respectively.

It can be concluded that majority of the beneficiaries and non-beneficiaries respondents were having medium level of experience in turmeric cultivation.

This might be the reason for the above trend. Definitely the farming experience is important factors which influence the respondents to accept evaluate and experiences the innovative technologies in their farms.

This finding is in accordance with Khalache *et al.* (2012), Dhalpe and Dawane (2016) and Verma *et al.* (2014).

4.1.1.8 House type

The data presented in Table 4.8 reveals that out of total 44.69 per cent of the respondents had mixed housing facility, followed by 33.12 per cent respondents with kutcha house and only 22.19 per cent of them had pucca house.

Table 4.8: Distribution of the respondents according to their house type

Sl. No.	House type	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Kutcha house	50	31.25	56	35.00	106	33.12
2	Mixed house	61	38.12	82	51.25	143	44.69
3	Pucca house	49	30.63	22	13.75	71	22.19
	Total	160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, most of the respondents (38.12%) had mixed type of house, followed by 31.25 per cent respondents had kutcha house and 30.63 per cent of them pucca house.

With respect to non-beneficiaries maximum number of the respondents (51.25%) had mixed house, whereas 35.00 per cent respondents had kutcha and 13.75 per cent of them had pucca house.

It can be concluded that majority of the respondents of both the groups were found in mixed type of house.

The increase in income has helped them to built pucca house, traditional house repaired and maintained every year, designed for proper aeration, whitewash their residence every year.

This result was in agreement with the findings of Shukla and Sharam (2010), Singh *et al.* (2009), Seemaprakalpa and Mishra (2014).

4.1.2 Socio-economic characteristics of the respondents

4.1.2.1 Occupation

The data given in Table 4.9 and Fig. 4.3 indicates that out of total respondents, 60.63 per cent were engaged in labour, followed by agriculture (24.38%), service (5.62%), business (4.06%), other profession (3.75%) and caste occupation (1.56%) in addition with agriculture as major occupation.

Table 4.9: Distribution of the respondents according to their occupation

Sl. No.	Occupation	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Only Agriculture	51	31.87	27	16.87	78	24.38
2	Agriculture + Labour	82	51.25	112	70.00	194	60.63
3	Agriculture + Caste occupation (Barbar, dairy and fisher man)	2	1.25	3	1.88	5	1.56
4	Agriculture + Business	10	6.25	3	1.88	13	4.06
5	Agriculture + Independent Professions (Tailoring, Pan shop, Bicycle and TV repairing etc.)	4	2.50	8	5.00	12	3.75
6	Agriculture + Service	11	6.88	7	4.37	18	5.62
Total		160	100	160	100	320	100

F – Frequency, % - percentage

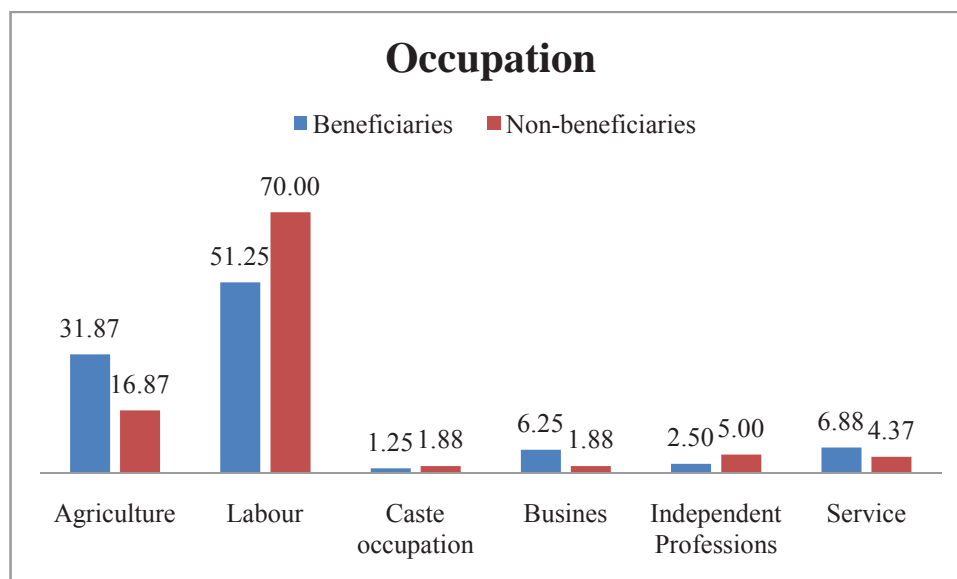


Fig. 4.3: Distribution of the respondents according to their occupation

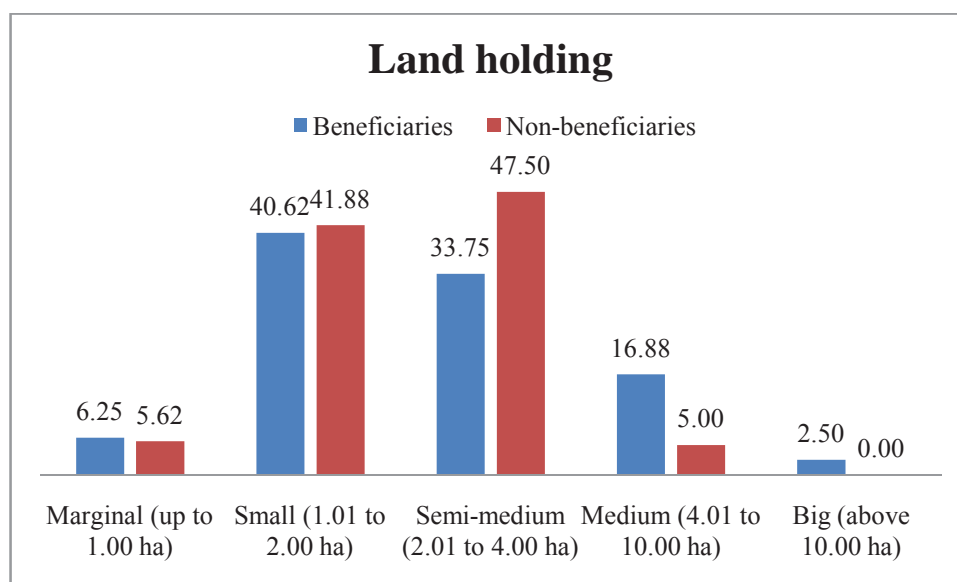


Fig. 4.4: Distribution of the respondents according to their land holding

In case of beneficiaries, 51.25 per cent were engaged in labour, followed by agriculture (31.87%), service (6.88%), business (6.25%), independent profession (2.50%) and caste occupation (1.25%) in addition to agriculture.

Similarly, in case of non-beneficiaries, 70.00 per cent were engaged in labour, while agriculture (16.87%), other profession (5.00%), service (4.37%) and caste and business (1.88%) with doing agriculture.

The main occupation of the beneficiaries and non-beneficiaries respondents is agriculture. This was followed by self-employment and daily wages labour, although a few small scale and medium business have recently come up. Hence, it attributes to the results that majority of the beneficiaries and non-beneficiaries are engaged in cultivation.

This observation is in conformity with the conclusion of Shukla and Sharma (2010), Gamanagatti and Dodamani (2016) and Mugadur and Hiremath (2014).

4.1.2.2 Land holding

The data presented in Table 4.10 and Fig. 4.4 reveals that out of total, 41.25 per cent of the respondents were small farmer, followed by semi-medium farmers (40.62%), medium farmers (10.94%), marginal farmers (5.94%) and big farmers (1.25%).

Table 4.10: Distribution of the respondents according to land holding

Sl. No.	Land holding	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Marginal (up to 1.00 ha)	10	6.25	9	5.62	19	5.94
2	Small (1.01 to 2.00 ha)	65	40.62	67	41.88	132	41.25
3	Semi-medium (2.01 to 4.00 ha)	54	33.75	76	47.50	130	40.62
4	Medium (4.01 to 10.00 ha)	27	16.88	8	5.00	35	10.94
5	Big (above 10.00 ha)	4	2.50	0	0.00	4	1.25
Total		160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, 40.62 per cent of the respondents were small farmers (1.01 to 2.00 ha), whereas semi-medium farmers (33.75%), medium farmers (16.88%), marginal farmers (6.25%) and big farmers (2.50%).

Similarly, in case of non-beneficiaries, 47.50 per cent of the respondents were semi-medium farmers, followed by small farmers (41.88%), marginal farmers (5.62%) and big farmers (5.00%).

Thus, it can be concluded that majority of the beneficiaries belonged to small land holding and non-beneficiaries belonged to semi-medium land holding category.

This result corroborates with the findings of Jobpaul and Rao (2011), Verma *et al.* (2014) and Boruah *et al.* (2015).

4.1.2.3 Soil type of available land

The common classification of land in the study area is done according to land situation and broadly divided into *Bhata*, *Matasi*, *Dorsa* and *Kanhar*. This classification is also scientifically based on soil topography and depth and these terms are used by pedologists known as *Entisols*, *Inceptisols*, *Alfisols* and *Vertisols*, respectively.

Table 4.11: Distribution of the respondents according to soil type of available land

Sl. No.	Soil type	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F*	%	F*	%	F*	%
1	<i>Bhata(Entisols)</i>	15	9.38	10	6.25	25	7.81
2	<i>Matasi(Inceptisols)</i>	72	45.00	100	62.50	172	53.75
3	<i>Dorsa (Alfisols)</i>	56	35.00	44	27.50	100	31.25
4	<i>Kanhar(Vertisols)</i>	87	54.38	93	58.13	180	56.25

*Data are based on multiple responses

The data presented in Table 4.11 reveals that out of total, 56.25 per cent of the respondents were occupied *Vertisols* type of land, followed by 53.75 per cent respondents *Inceptisols* and 31.25 per cent respondents *Alfisols*. About 7.81 per cent of them occupied *Entisols* type of land.

In case of beneficiaries, majority of the respondents (54.38%) were occupied *Vertisols* type of land, followed by 45.00 per cent respondents had *Inceptisols*. While 35.00 per cent respondents possessed *Alfisols* and only 9.38 per cent of them occupied *Entisols* type of land.

Similarly, in case of non-beneficiaries, 62.50 per cent of the respondents were occupied *Inceptisols* type of land, whereas 58.13 per cent respondents *Vertisols* and 27.50 per cent respondents *Alfisols*. About 6.25 per cent of them occupied *Entisols* type of land.

A close observation of the above data clearly indicates that the majority of the beneficiaries were having *Vertisols* types of land, while in case of non-beneficiaries majority were having *Inceptisols* type of land.

This result corroborates with the findings of Dhruw (2014).

4.1.2.4 Area under different soil type

Regarding the coverage of area according to soil types in the study area, the results presented in Table 4.12 reveals that out of total land, 38.32 per cent land in the study area falls under the *Inceptisols*, followed by *Vertisols* (36.69%) and *Alfisols* (21.53%). About 3.46 per cent area falls under the *Entisols* type of land.

Table 4.12: Distribution of area of the respondents according to different soil types

Sl. No.	Soil type	Area (ha)					
		Beneficiaries		Non-beneficiaries		Total	
		Area	%	Area	%	Area	%
1	Bhata(<i>Entisols</i>)	19.43	4.41	7.69	2.24	27.12	3.46
2	Matasi(<i>Inceptisols</i>)	141.90	32.18	158.91	46.20	300.81	38.32
3	Dorsa (<i>Alfisols</i>)	108.00	24.50	60.93	17.72	168.93	21.53
4	Kanhar(<i>Vertisols</i>)	171.54	38.91	116.40	33.84	287.94	36.69
Total		440.87	100	343.93	100	784.80	100

The data on area under different soil type depicts that out of total land available with the beneficiaries, 38.91 per cent land in the study area falls under the *Vertisols*, followed by *Inceptisols* (32.18%) and *Alfisols* (24.50%). About 4.41 per cent of area falls under the *Entisols* type of land.

Whereas, out of total land available with the non-beneficiaries, 46.20 per cent area falls under the *Inceptisols*, followed by *Vertisols* (33.84%) and *Alfisols* (17.72%). About 2.24 per cent area falls under the *Entisols* type of land.

It can be concluded that most of the land available with beneficiaries were having *Vertisols* and *Inceptisols* soil type in case of beneficiaries, whereas *Inceptisols* and *Vertisols* in case non-beneficiaries in the study area.

4.1.2.5 Irrigation facilities

The data were subjected to percentage distribution of respondents according to their irrigation source. The data given in Table 4.13 and Fig. 4.5 reveals that out of total, 41.25 per cent of the respondents were having tube well, followed by no irrigation sources (40.94%), canal (8.75%), well (5.94%) and river (5.94%) and pond (1.25%).

In case of beneficiaries, 50.63 per cent of the respondents were having tube well, no irrigation sources (33.13%), canal (9.39%), well (6.88%), river (4.38%) and pond (1.25%).

Table 4.13: Distribution of the respondents according to irrigation facilities available in their land holding

Sl. No.	Irrigation availability	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F*	%	F*	%	F*	%
1	No source	53	33.13	78	48.75	131	40.94
2	Canal	15	9.39	13	8.13	28	8.75
3	River	7	4.38	12	7.50	19	5.94
4	Well	11	6.88	8	5.00	19	5.94
5	Tube well	81	50.63	51	31.88	132	41.25
6	Pond	2	1.25	3	1.88	5	1.25

*Data are based on multiple responses

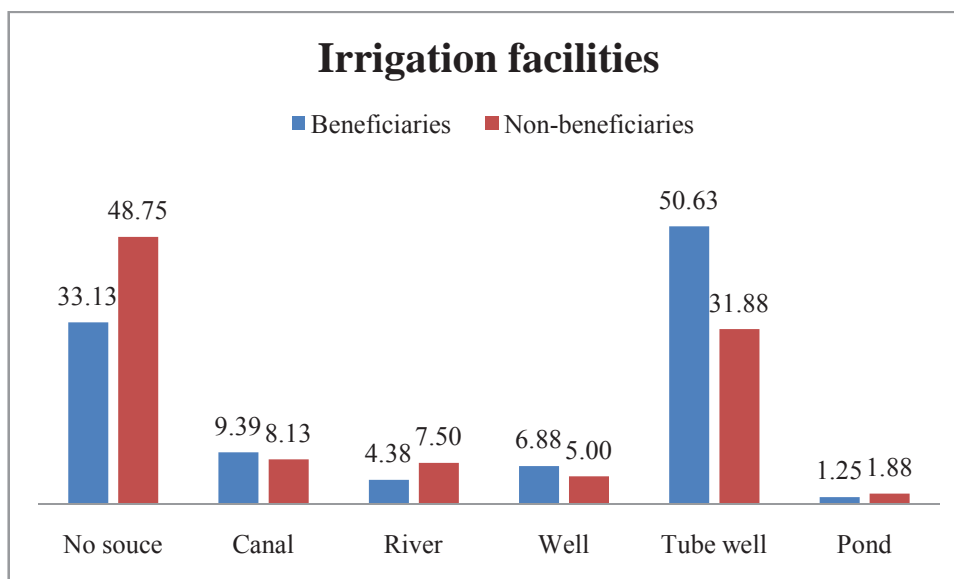


Fig. 4.5: Distribution of the respondents according to irrigation facilities available in their land holding

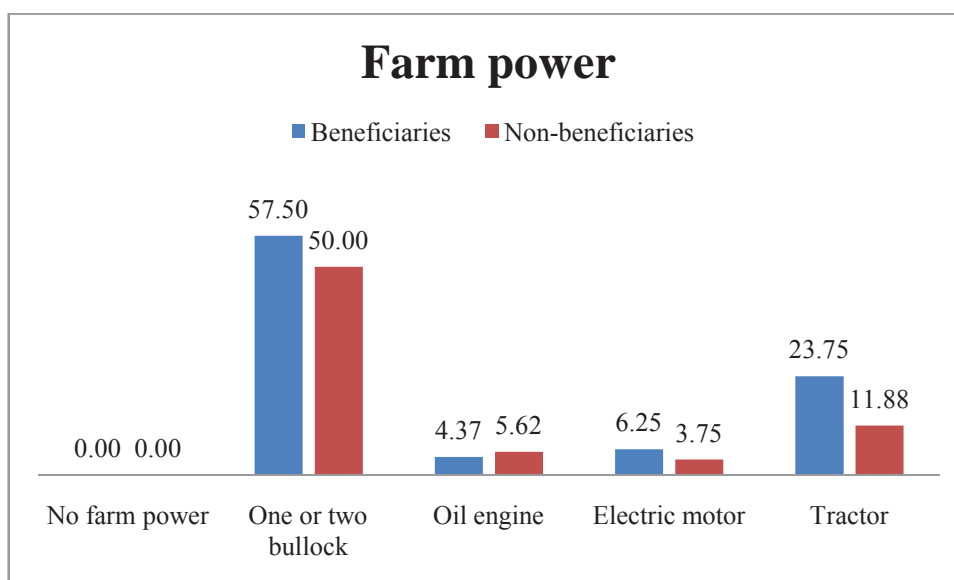


Fig. 4.6: Distribution of the respondents according to farm power

Similarly, in case of non-beneficiaries, 48.75 per cent of the respondents were not having any irrigation sources, followed by tube well (31.88%), canal (8.13%), river (7.50%), well (5.00%) and ponds (1.88%).

The reason might be that majority of both the groups have tube well as a source of irrigation which covers most of the land under irrigated area.

This result derives support from the inferences of Das and Puzari (2010) and Savita *et al.* (2011).

4.1.2.6 Farm power

The data presented in Table 4.14 and Fig. 4.6 were subjected to percentage distribution of the respondents according to their farm power. The data indicates that out of total, 53.75 per cent of the respondents possessed one or two bullocks, followed by tractor (17.81%), electric motor (10.00%) and oil engine (10.00%).

In case of beneficiaries, 57.50 per cent of the respondents possessed one or two bullock, while tractor (23.75%), electric motor (6.25%) and oil engine (4.37%).

With respect to non-beneficiaries, 50.00 per cent of the respondents possessed one or two bullocks, followed by tractor (11.88%), oil engine (5.62%) and electric motor (3.75%).

Table 4.14: Distribution of the respondents according to farm power

Sl. No	Farm power	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F*	%	F*	%	F*	%
1	No farm power	0	0.00	0	0.00	0	0.00
2	One or two bullock	92	57.50	80	50.00	172	53.75
3	Oil engine	7	4.37	9	5.62	16	10.00
4	Electric motor	10	6.25	6	3.75	16	10.00
5	Tractor	38	23.75	19	11.88	57	17.81

*Data are based on multiple responses

The reason for this kind of increase in possession of farm power may be due to high subsidy facility and also due to increase income might have motivated them to go for more number of improved implements.

This result derives support from the inferences of Shukla and Sharma (2010), Savita *et al.* (2011), Shukla and Gupta (2016) and Singh *et al.* (2009).

4.1.2.7 Annual income

The data on annual income of the respondents are given in Table 4.15 and Fig. 4.7. It was reported that 42.19 per cent respondents had earned their annual income ranges between ₹ 1,00,001 to 2,00,000, followed by 30.94 per cent respondents earned ₹ 2,00,001 to 4,00,000, while 14.69 per cent respondents earned up to ₹ 1,00,000 and 7.81 per cent earned ₹4,00,001 to 6,00,000. About 4.37 per cent respondents earned more than ₹ 6,00,000.

In case of beneficiaries, most of the respondents (36.25%) had earned their annual income ranges between ₹ 1,00,001 to 2,00,000, followed by 33.12 per cent respondents earned ₹ 2,00,001 to 4,00,000, whereas 12.50 per cent respondents earned more than ₹ 4,00,001 to 6,00,000 and 11.88 per cent had earned up to ₹ 1,00,000. About 6.25 per cent respondents earned above ₹ 6,00,000.

Table 4.15: Distribution of the respondents according to their annual income

Sl. No.	Annual income (Rs.)	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Up to ₹ 1,00,000	19	11.88	28	17.50	47	14.69
2	₹ 1,00,001 to 2,00,000	58	36.25	77	48.12	135	42.19
3	₹ 2,00,001 to 4,00,000	53	33.12	46	28.75	99	30.94
4	₹ 4,00,001 to 6,00,000	20	12.50	5	3.13	25	7.81
5	Above ₹ 6,00,000	10	6.25	4	2.50	14	4.37
	Total	160	100	160	100	320	100
	Mean	291065.52		185618.75			
	SD	176019.98		98472.86			
‘Z’ value = 4.246**							

**0.01 level of probability

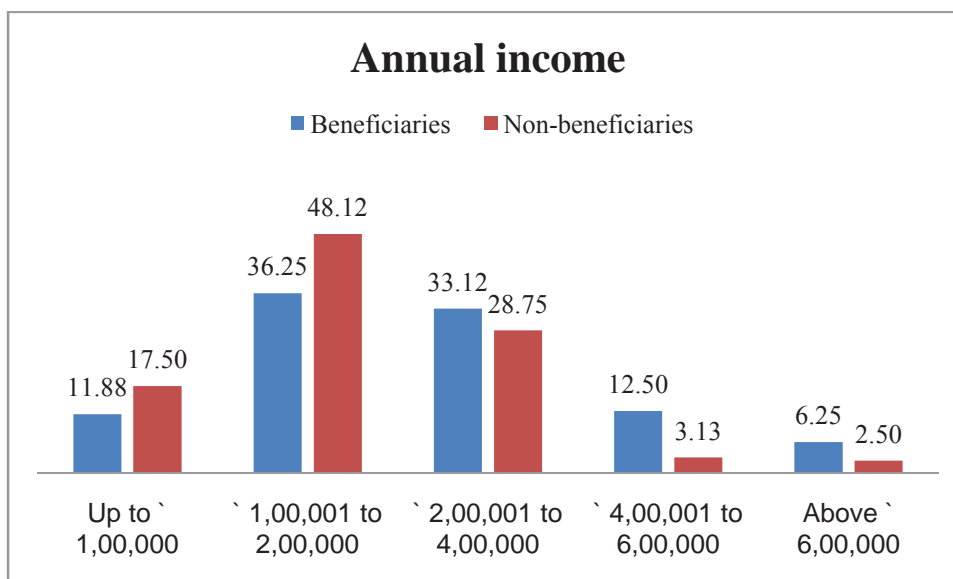


Fig. 4.7: Distribution of the respondents according to their annual income

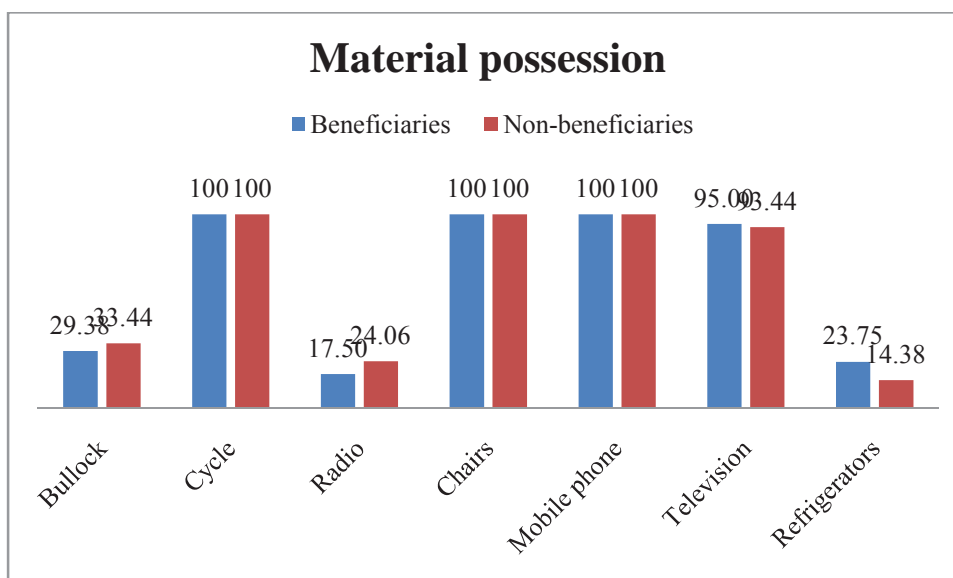


Fig. 4.8: Distribution of the respondents according to their material possession

Similarly, in case of non-beneficiaries, most of the respondents (48.12%) had earned ₹ 1,00,001 to 2,00,000, Whereas 28.75 per cent respondents earned ₹2,00,001 to 4,00,000, while 17.50 per cent respondents earned up to ₹ 1,00,000 and 3.13 per cent earned ₹ 4,00,001 to 6,00,000. About 2.50 per cent respondents earned more than ₹ 6,00,000.

The calculated 'Z' value for annual income was 4.246 which was found to be significant at 0.01 level of probability. Thus the earlier stated null hypothesis that there is no difference between the annual income of beneficiaries and non-beneficiaries was rejected. Therefore, it can be concluded that there is significant difference between annual income of beneficiaries and non-beneficiaries respondents.

It can be concluded that majority of the beneficiaries as well as non-beneficiaries respondents had earned their annual income ranges between ₹ 1,00,000 to 2,00,000.

The probable reason might be their small land holding and another reason might be the low production of agricultural commodities due to unavailability of resources i.e. water and soil fertility etc.

This finding is in accordance with Salunkhe *et al.* (2012), Seemaprakalpa and Mishra (2014).

4.1.2.8 Credit acquisition

The data presented in Table 4.16 reveals that out of the total respondents, 89.69 per cent had acquired credit facility and 10.31 per cent had not acquired any credit facility.

In case of beneficiaries, 93.12 per cent had acquired credit facility and 6.88 per cent had not acquired credit facility.

Similarly, in case of non-beneficiaries, 86.25 per cent had acquired credit facility and 13.75 per cent had not acquired credit facility.

The findings reveal that out of total, 77.00 per cent of the respondents had acquired credit facility from co-operative society, whereas 17.08 per cent respondents from other sources and only 5.92 per cent respondents had acquired credit from nationalized bank.

With respect to beneficiaries, 75.83 per cent had acquired credit from co-operative society, followed by 16.78 per cent from nationalized bank and 7.39 per cent from other sources like money lender and friends.

Table 4.16: Distribution of the respondents according to their credit acquisition

Sl. No.	Credit acquisition	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
A	Credit acquisition						
1	Not acquired	11	6.88	22	13.75	33	10.31
2	Acquired	149	93.12	138	86.25	287	89.69
	Total	160	100	160	100	320	100
B	Source of credit						
1	Co-operative society	113	75.83	108	78.26	221	77.00
2	Nationalized bank	11	7.39	6	4.35	17	5.92
3	Other sources (Money lenders & friends)	25	16.78	24	17.39	49	17.08

F – Frequency, % - percentage

Among the non-beneficiaries, 78.26 per cent had acquired credit from co-operative society, followed by 17.39 per cent from nationalized bank and 4.35 per cent from other sources like money lender and friends.

It can be concluded from the above findings that vast majority of the beneficiaries respondents had acquired credit.

The reason for drastic change in high level might be the respondents got easy access to get loans and could contact banks frequently. Thus, they felt that they have got much knowledge on credit facilities.

This finding is in accordance with Bolarinwa and Fakoya (2011), Singh (2014) and Devaki *et al.* (2015).

4.1.2.9 Material possession

The data on material possession of the respondents are depicted in Table 4.17 and Fig. 4.8. It can be seen that out of total, cent per cent of the respondents possessed cycle, chairs and mobile, followed by television (93.44%), bullock cart (33.44%), radio (24.06%) and Refrigerators (14.38%).

In case of beneficiaries, cent per cent of the respondents possessed cycle, chairs and mobile phone, followed by television (95.00%), bullock cart (29.38%), refrigerators (23.75%) and radio (17.50%).

Table 4.17: Distribution of the respondents according to their material possession

Sl. No.	Material possession	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F*	%	F*	%	F*	%
1	Bullock cart	47	29.38	60	37.50	107	33.44
2	Cycle	160	100.00	160	100.00	320	100.00
3	Radio	28	17.50	49	30.63	77	24.06
4	Chairs	160	100.00	160	100.00	320	100.00
5	Mobile phone	160	100.00	160	100.00	320	100.00
6	Television	152	95.00	147	91.88	299	93.44
7	Refrigerators	38	23.75	8	5.00	46	14.38

*Data are based on multiple responses

Similarly, in case of non-beneficiaries, cent per cent of the respondents possessed cycle, chairs and mobile phone, followed by television (91.88%), bullock cart (37.50%), radio (30.63%) and refrigerators (5.00%).

The data presented in Table 4.18 reveals that out of total, 65.00 per cent of the respondents possessed medium level of material, followed by 32.81 and 2.19 per cent of them who had low and high material possession, respectively.

In case of beneficiaries, majority of the respondents (70.00%) had medium level of material possession, while 27.50 and 2.50 per cent had low and high level of material possession, respectively.

Table 4.18: Distribution of the respondents according the their overall material possession

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	44	27.50	61	38.12	105	32.81
2	Medium	112	70.00	96	60.00	208	65.00
3	High	4	2.50	3	1.88	7	2.19
	Total	160	100	160	100	320	100
	Mean	3.98		3.81			
	SD	0.83		0.87			
‘Z’ value = 1.777 NS							

NS = Non-significant

Whereas, in case of non-beneficiaries, majority of the respondents (60.00%) had medium level of material possession, followed by 38.12 per cent had low level of material possession and 1.88 per cent had high level of material possession.

The calculated ‘Z’ value for material possession was 1.777 which was found to be non-significant. Thus the earlier stated null hypothesis that there is no difference between material possession of beneficiaries and non-beneficiaries was not rejected. Hence, it can be concluded that there is no difference between material possession of beneficiaries and non-beneficiaries.

It can be concluded that majority of the beneficiaries as well as non-beneficiaries have medium level of material possession.

The reason might be that now a days it is a trend that almost all have mobile and television as the major source of entertainment among the rural people. Similarly owning bicycle would facilitate moment within the village and to the field. Due to increase in land productivity, income level might have increased their purchasing power.

Similar results were observed by Shukla and Sharma (2010), Savita *et al.* (2011) and Shukla and Gupta (2016).

4.1.3 Technological characteristics of the respondents

4.1.3.1 Seed source

Regarding seed source the data presented in Table 4.19 depicts that out of total, 50.00 per cent respondents had seed available from NHM office, while 43.12 per cent of them had used own seed and only 6.88 per cent respondents had used seed from market.

In case of beneficiaries, cent per cent of the respondents had seed available from NHM office.

Table 4.19: Distribution of the respondents according to seed source of turmeric

Sl. No.	Seed sources	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Own	0	0.00	138	86.25	138	43.12
2	NHM office	160	100	0	0.00	160	50.00
3	Market	0	0.00	22	13.75	22	6.88
	Total	160	100	160	100	320	100

F – Frequency, % - percentage

Similarly, in case of non-beneficiaries, 86.25 per cent of the respondents had used own seed and 13.75 per cent of the respondents were used seed from market.

From the above findings it can be concluded that all beneficiaries had seed used from NHM office whereas in the case of non-beneficiaries, majority of the respondents had used their own seed for turmeric cultivation.

4.1.3.2 Storage

Regarding seed storage the data presented in Table 4.20 reveals that out of total respondents, 85.31 per cent did seed storage in ventilated room, whereas 47.50 per cent of them had seed storage in gunny bags.

In case of beneficiaries, majority of the respondents (81.25%) did seed storage in ventilated room and 53.12 per cent of them had seed storage in gunny bags.

Table 4.20: Distribution of the respondents according to storage facilities for turmeric

Sl. No.	Storage facilities	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Ventilated room	130	81.25	143	89.37	273	85.31
2	Gunny bags	85	53.12	67	41.87	152	47.50

*Data are based on multiple responses

Similarly, in case of non-beneficiaries, 89.37 per cent of the respondents had seed storage in ventilated room and 41.87 per cent of them did seed storage in gunny bags.

Hence, from the results, it can be concluded that majority of the beneficiaries and non-beneficiaries respondents were storing seed in ventilated room.

4.1.3.3 Processing and value addition for marketing

Regarding processing and value addition for marketing, the data presented in Table 4.21 reveals that out of total, cent per cent of the respondents were naturally drying the turmeric in sunlight, while 65.31 per cent respondents were involved in curing of turmeric and 54.37 per cent of them did grading of turmeric for better price in market.

Table 4.21: Distribution of the respondents according to processing and value addition practices of turmeric for marketing

Sl. No.	Practices	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F*	%	F*	%	F*	%
1	Curing	123	76.87	86	53.75	209	65.31
2	Drying	160	100	160	100	320	100
3	Grading	107	66.87	67	41.87	174	54.37

*Data are based on multiple responses

In case of beneficiaries, cent per cent of the respondents were naturally drying the turmeric in sunlight, whereas 76.87 per cent respondents were doing curing of turmeric and 66.87 per cent did grading for good market price.

Similarly, in case of non-beneficiaries, cent per cent of the respondents were naturally drying the turmeric in sunlight, while 53.75 per cent of them did curing of turmeric and 41.87 per cent respondents were doing grading for good market price.

Further, it can be concluded that cent per cent of the beneficiaries and non-beneficiaries respondents were naturally drying the turmeric in sunlight.

4.1.3.4 Processing and value addition for own consumption

The results presented in Table 4.22 depicts that out of total respondents doing processing and value addition for their own consumption, cent per cent of the respondents were performing boiling/drying/grinding followed by curing (28.75%) and grading (5.94%).

In case of beneficiaries, 100 per cent respondents were doing boiling, drying and grinding, followed by curing (33.75%) and grading (6.88%).

Table 4.22: Distribution of the respondents according to processing and value addition practices of turmeric for own consumption

Sl. No.	Practices	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F*	%	F*	%	F*	%
1	Curing	54	33.75	38	23.75	92	28.75
2	Boiling	160	100	160	100	320	100
3	Drying	160	100	160	100	320	100
4	Grading	11	6.88	8	5.00	19	5.94
5	Grinding	160	100	160	100	320	100

*Data are based on multiple responses

Similarly, in case of non-beneficiaries, doing processing and value addition for their own consumption 100 per cent were performing boiling, drying and grinding, followed by curing (23.75%) and grading for next seasons (5.00%).

It can be concluded that cent per cent of the beneficiaries and non-beneficiaries respondents were adopting processing practices in turmeric like boiling, drying and grinding.

4.1.4 Communicational characteristics of the respondents

4.1.4.1 Contact with extension personnel

The data presented in Table 4.23 reveals that in case of beneficiaries, cent per cent of the respondents were aware about field consultant, followed by 86.25 per cent aware about RHEO, while 20 per cent aware about HDO and 54.38 per cent aware about SHDO. About 85 per cent were aware about Scientist.

Table 4.23: Distribution of the beneficiaries according to their contact with extension personnel regarding turmeric cultivation

Sl. No.	Extension Personnel	Awareness		Contact level		
		Yes	No	R	S	N
		F	F	F	F	F
		(%)	(%)	(%)	(%)	(%)
1	Field consultant of NHM	160 (100)	0 (0.00)	97 (60.62)	63 (39.38)	0 (0.00)
2	RHEO	138 (86.25)	22 (13.75)	37 (23.13)	109 (68.12)	14 (8.75)
3	HDO	32 (20.00)	128 (80.00)	1 (0.63)	1 (0.63)	158 (98.74)
4	SHDO	87 (54.38)	73 (45.62)	8 (5.00)	15 (9.38)	137 (85.62)
5	KVK (Scientist)	136 (85.00)	24 (15.00)	2 (1.25)	11 (6.88)	147 (91.87)

R- Regular, S- Sometime, N-Never

Regarding beneficiaries, none of the respondents had contact with field consultant, followed by 39.38 per cent respondents sometime and 60.62 per cent of them regularly contacted. About 8.75 per cent respondents had no contact with RHEO, while 68.13 per cent respondents sometime and 23.13 per cent of them

regularly contacted. About 98.75 per cent respondents had no contact with HDO, followed by 0.63 per cent respondents sometime and 0.63 per cent regularly contacted. About 85.63 per cent of the respondents had no contact with SHDO, while 9.38 per cent respondents sometime and 5 per cent of them regularly contacted. About 91.88 per cent of the respondents had no contact with scientist, followed by 6.88 per cent respondents sometime and 1.25 per cent of them regularly contacted the scientist.

The data presented in Table 4.24 reveals that in case of non-beneficiaries, 46.88 per cent of the respondents had awareness about field consultant, followed by 91.88 per cent aware about RHEO, while 17.50 per cent were aware about HDO and 49.38 per cent aware about SHDO. About 81.88 per cent were aware about Scientist.

Table 4.24: Distribution of the non-beneficiaries according to their contact with extension personnel regarding turmeric cultivation

Sl. No.	Extension Personnel	Awareness		Contact level		
		Yes F (%)	No F (%)	R F (%)	S F (%)	N F (%)
1	Field consultant of NHM	75 (46.88)	85 (53.12)	0 (0.00)	30 (18.75)	130 (81.25)
2	RHEO	147 (91.88)	13 (8.12)	48 (30.00)	107 (66.88)	5 (3.12)
3	HDO	28 (17.50)	132 (82.50)	0 (0.00)	7 (4.38)	153 (95.62)
4	SHDO	79 (49.38)	81 (50.62)	3 (1.88)	36 (22.50)	121 (75.62)
5	KVK (Scientist)	131 (81.88)	29 (18.12)	0 (0.00)	8 (5.00)	152 (95.00)

R- Regular, S- Sometime, N-Never

Regarding non-beneficiaries, 81.25 per cent of the respondents had no contact with field consultant, followed by 18.75 per cent respondents sometime

and none of them not regularly contacted. About 3.13 per cent respondents had no contact with RHEO, while 66.88 per cent respondents sometime and 30.00 per cent of them regularly contacted. About 95.63 per cent respondents had no contact with HDO, followed by 4.38 per cent respondents sometime and none of them not regularly contacted. About 75.63 per cent of the respondents had no contact with SHDO, while 22.50 per cent respondents sometime and 1.88 per cent of them regularly contacted. About 95.00 per cent of the respondents had no contact with scientist, followed by 5.00 per cent respondents sometime and none of them regularly contacted the scientist.

The data given in Table 4.25 and Fig. 4.9 reveals that out of total, maximum number of the respondents (51.56%) had medium level of extension contact, followed by 41.56 per cent had low and 6.88 per cent had high level of extension contact.

Table 4.25: Distribution of the respondents according to their overall extension contact regarding turmeric cultivation

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	65	40.63	68	42.50	133	41.56
2	Medium	77	48.12	88	55.00	165	51.56
3	High	18	11.25	4	2.50	22	6.88
	Total	160	100	160	100	320	100
	Mean	3.06		1.81			
	SD	1.28		0.87			

'Z' value = 2.575*

*0.05 level of probability

In case of beneficiaries, most of the respondents (48.12%) had medium level of extension contact, followed by 40.63 per cent had low and 11.25 per cent had high level of extension contact.

Similarly, in case of non-beneficiaries, 55.00 per cent of the respondents had medium level of extension contact, while 42.50 per cent had low and 2.50 per cent had high level of extension contact.

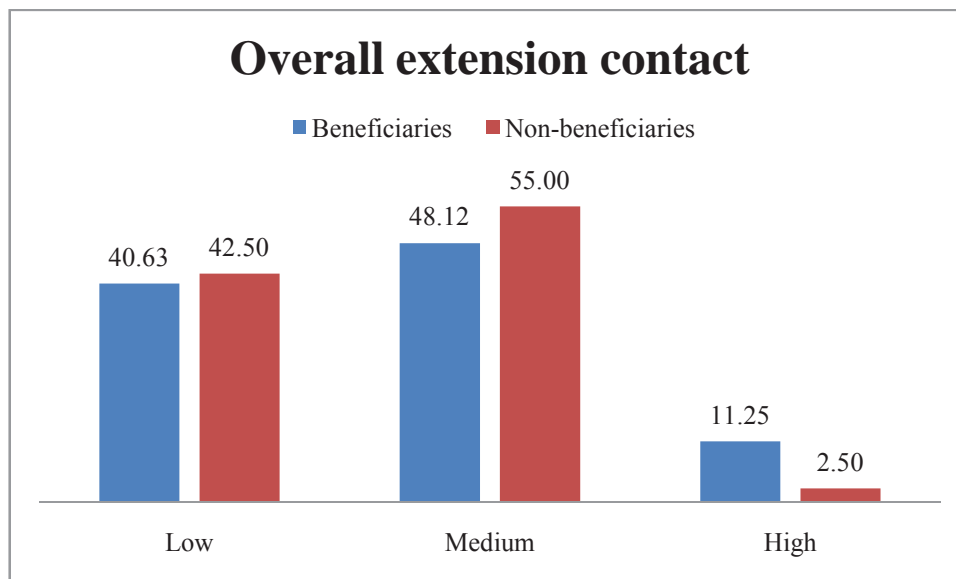


Fig. 4.9: Distribution of the respondents according to their overall extension contact

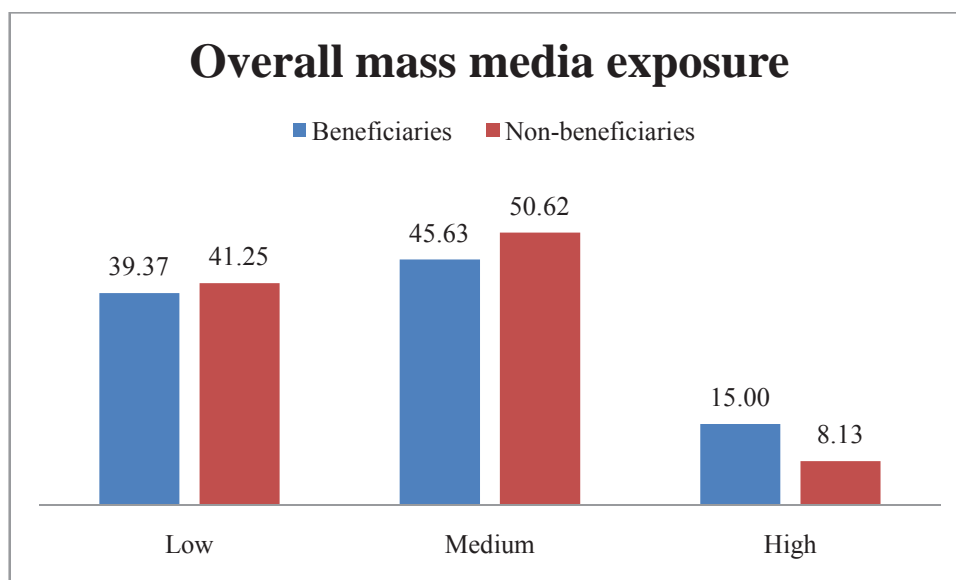


Fig. 4.10: Distribution of the respondents according to their overall mass media exposure

The calculated 'Z' value for extension contact was 2.575 which was found to be significant at 0.05 level of probability. Thus the earlier stated null hypothesis that there is no difference between extension contact of beneficiaries and non-beneficiaries was rejected. Therefore, it can be concluded that there is significant difference between extension contacts of beneficiaries and non-beneficiaries.

A close observation of the above data clearly indicates that the majority of the beneficiaries and non-beneficiaries respondents had medium to low level of extension contact.

The reason for this might be the beneficiaries respondents were participated in various non-formal educational activities including visit of demonstration unit and training etc. The non-beneficiaries had less interest as compared to beneficiaries respondents.

The similar results were also reported by Sanjeev and Saroj (2014), Garg *et al.* (2013) and Girawale *et al.* (2016).

4.1.4.2 Mass media exposure

It was evident from the Table 4.26 that great majority of the respondents (87.50%) did not read any newspaper, followed by 9.38 per cent were reading sometime and only 3.13 per cent read regularly. About 81.25 per cent respondents did not read agriculture magazines, followed by 14.37 per cent read sometime and 4.38 per cent read regularly. About 82.50 per cent respondents did not listen to radio, followed by 11.88 per cent listened sometime and 5.62 per cent listened regularly. About 14.38 per cent respondents never view television, whereas 47.50 per cent viewed sometime and 38.12 per cent viewed regularly. About 67.50 per cent respondents never call to kisan call centre, while 25.00 per cent called sometime and 7.50 per cent called regularly. About 86.25 per cent respondents did not use internet, followed by 8.75 per cent used sometime and 5.00 per cent used regularly.

With respect to non-beneficiaries, majority of the respondents (91.87%) did not read any newspaper, followed by 6.88 per cent read sometime and only 1.25 per cent read regularly. About 80.62 per cent respondents were not reading agriculture magazines, followed by 16.88 per cent read sometime and 2.50 per cent read regularly. About 69.38 per cent respondents did not listen to radio, followed

by 22.50 per cent listened sometime and 8.12 per cent listened regularly. About 31.87 per cent respondents never view television, whereas 43.75 per cent viewed in sometime and 24.38 per cent viewed regularly. About 71.88 per cent respondents never call to kisan call centre, while 22.50 per cent call sometime and 5.62 per cent call regularly. About 90 per cent respondents did not use internet, followed by 6.88 per cent used sometime and 3.12 per cent used regularly.

Table 4.26: Distribution of the respondents according to their mass media use

Sl. No.	Mass media exposure	Respondents					
		Beneficiaries			Non-beneficiaries		
		R	S	N	R	S	N
		F	F	F	F	F	F
		(%)	(%)	(%)	(%)	(%)	(%)
1	Newspaper	5 (3.12)	15 (9.38)	140 (87.50)	2 (1.25)	11 (6.88)	147 (91.87)
2	Agriculture magazines	7 (4.38)	23 (14.37)	130 (81.25)	4 (2.50)	27 (16.88)	129 (80.62)
3	Radio	9 (5.62)	19 (11.88)	132 (82.50)	13 (8.12)	36 (22.50)	111 (69.38)
4	Television	61 (38.12)	76 (47.50)	23 (14.38)	39 (24.38)	70 (43.75)	51 (31.87)
5	Kisan Call Centre	12 (7.50)	40 (25.00)	108 (67.50)	9 (5.62)	36 (22.50)	115 (71.88)
6	Internet	8 (5.00)	14 (8.75)	138 (86.25)	5 (3.12)	11 (6.88)	144 (90.00)

R- Regular, S- Sometime, N- Never

The data given in Table 4.27 and Fig. 4.10 brings to light about percentage distribution of the respondents which reveals that out of total, most of the respondents (48.13%) had medium level of mass media exposure, while 40.31 per cent had low and 11.56 per cent had high level of mass media exposure.

In case of beneficiaries, most of the respondents (45.63%) had medium level of mass media exposure, followed by 39.37 per cent had low and 15.00 per cent had high level of mass media exposure.

Table 4.27: Distribution of the respondents according to their overall mass media use

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	63	39.37	66	41.25	129	40.31
2	Medium	73	45.63	81	50.62	154	48.13
3	High	24	15.00	13	8.13	37	11.56
	Total	160	100	160	100	320	100
	Mean	2.44		2.09			
	SD	1.92		1.51			
‘Z’ value = 1.854 NS							

NS = Non-significant

Similarly, in case of non-beneficiaries, majority of the respondents (50.62%) had medium level of mass media exposure, followed by 41.25 per cent had low and 8.13 per cent had high level of mass media exposure.

The calculated ‘Z’ value for mass media exposure was 1.854 which was found to be non-significant. Thus the earlier stated null hypothesis that there is no difference between mass media exposure of beneficiaries and non-beneficiaries was not rejected. Hence, it can be concluded that there is no difference between mass media exposure of beneficiaries and non-beneficiaries.

It can be concluded that majority of the beneficiaries and non-beneficiaries had low to medium level of mass media utilization.

This is due to the reason that they use the mass media as a source of information only when needed or when they face problem.

The similar results were also reported by Verma *et al.* (2014), Singh and Verma (2014) and Patil *et al.* (2010).

4.1.5 Psychological characteristics of the respondents

4.1.5.1 Scientific orientation

The data presented in Table 4.28 and Fig. 4.11 reveals that out of the total, 72.81 per cent of the respondents had medium level of scientific orientation, followed by 19.69 per cent had low and 7.50 per cent had high level of scientific orientation

Table 4.28: Distribution of the respondents according to their scientific orientation

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	36	22.50	27	16.87	63	19.69
2	Medium	111	69.38	122	76.25	233	72.81
3	High	13	8.12	11	6.88	24	7.50
	Total	160	100	160	100	320	100
	Mean	25.47		21.07			
	SD	1.65		2.43			
‘Z’ value = 2.575 *							

*0.05 level of probability

In case of beneficiaries, 69.38 per cent of the respondents had medium level of scientific orientation, while 22.50 per cent had low and 8.12 per cent had high level of scientific orientation.

Similarly, in case of non-beneficiaries, 76.25 per cent of the respondents had medium level of scientific orientation, followed by 16.87 per cent had low and 6.88 per cent had high level of scientific orientation.

The calculated ‘Z’ value for scientific orientation was 2.575 which was not found significant at 0.01 level of probability. Thus the earlier stated null hypothesis that there is no difference between scientific orientation of beneficiaries and non-beneficiaries was rejected. Therefore, it can be concluded that there is significant difference between scientific orientation of beneficiaries and non-beneficiaries.

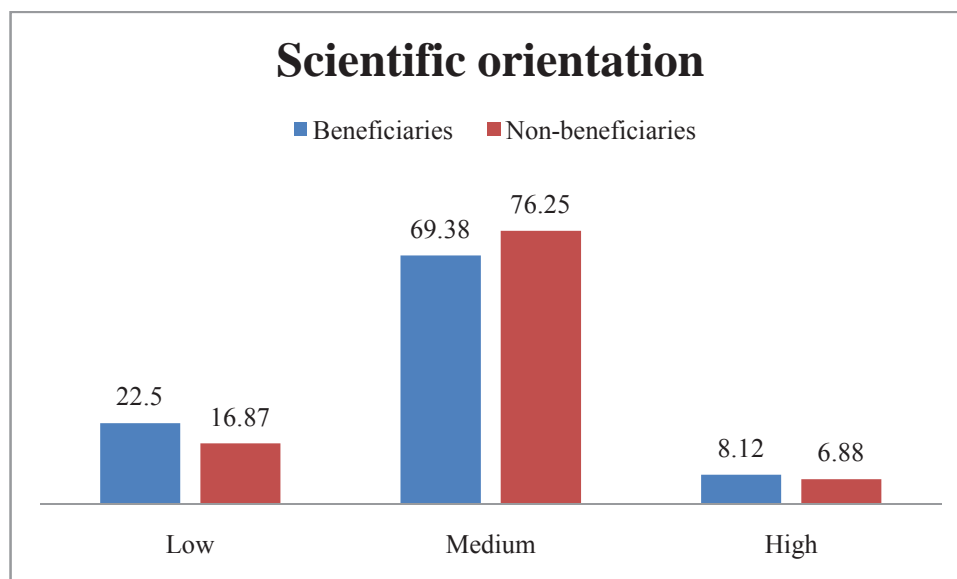


Fig. 4.11: Distribution of the respondents according to their scientific orientation

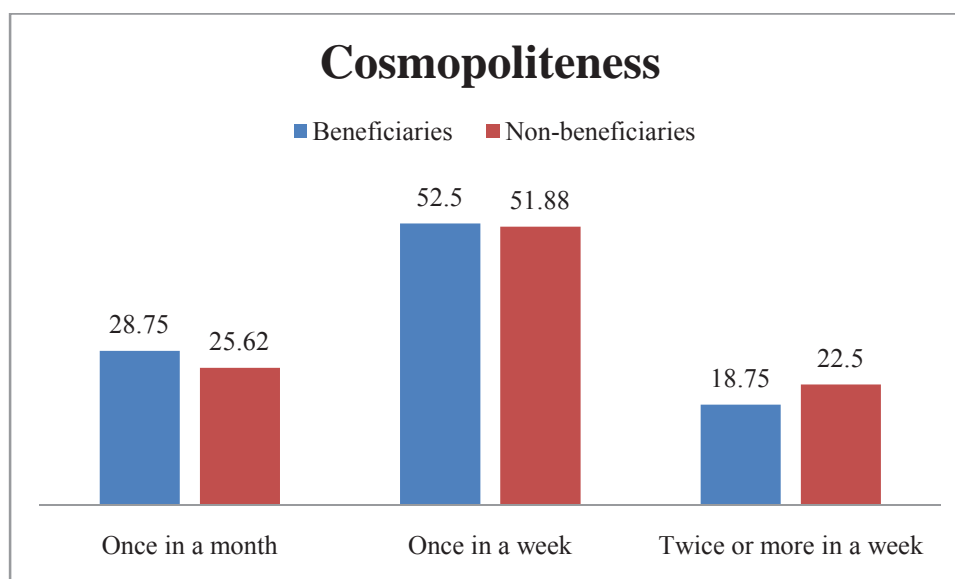


Fig. 4.12: Distribution of the respondents according to their cosmopoliteness

From the above findings it could be concluded that the majority of the beneficiaries respondents showed low to medium level of scientific orientation. Farmers education level, extension contact and exposure of mass media will motivate the farmers to know about the latest technologies in agriculture and horticulture. Therefore, the keen interest in trying to know about the latest technology. Turmeric needs more knowledge about cultivation practices and post harvest technology.

In case of non-beneficiaries, majority of the respondents showed medium level of scientific orientation. It is due to fact that non-beneficiaries did not show any interest to learn new technologies about cultivation practices and post harvest technology of turmeric but they prefer their regular and routine practices.

Jha (2012), Salunkhe *et al.* (2012) and Sriwas *et al.* (2015) noted almost similar findings.

4.1.5.2 Risk orientation

The data presented in Table 4.29 shows that out of the total, 80.31 per cent of the respondents had medium level of risk orientation, followed by 11.56 per cent had low and 8.13 per cent had high level of risk orientation.

Table 4.29: Distribution of the respondents according to their risk orientation

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	28	17.50	9	5.62	37	11.56
2	Medium	126	78.75	131	81.88	257	80.31
3	High	6	3.75	20	12.50	26	8.13
	Total	160	100	160	100.00	320	100
	Mean	24.94		20.73			
	SD	1.77		1.85			

'Z' value = 2.575 *

*0.05 level of probability

In case of beneficiaries, 78.75 per cent of the respondents had medium level of risk orientation, while 17.50 per cent had low and 3.75 per cent had high level of risk orientation.

Similarly, in case of non-beneficiaries, 81.88 per cent of the respondents had medium level of risk orientation, followed by 12.50 per cent had high and 5.62 per cent had low level of risk orientation.

The calculated 'Z' value for risk orientation was 2.575 which was not found significant at 0.01 level of probability. Thus the earlier stated null hypothesis that there is no difference between risk orientations of beneficiaries and non-beneficiaries was rejected. Hence, it can be concluded that there is significant difference between risk orientation of beneficiaries and non-beneficiaries.

It can be concluded that the majority of the beneficiaries and non-beneficiaries respondents had preferred to take medium level of risk.

It might be due to fact that the beneficiaries respondents are involved with income generating activities that mostly are related to horticulture and having high risk.

Whereas, non-beneficiaries respondents think that it is better for them not to try new farming methods unless most others have used them successfully. There is need to organize more demonstration.

Boruah *et al.* (2015), Jha (2012) and Salunkhe *et al.* (2012) found similar findings.

4.1.5.3 Cosmopolitaness

The data presented in Table 4.30 and Fig. 4.12 reveals that out of the total, 52.19 per cent had medium cosmopolitaness, followed by 27.19 per cent respondents had low and 20.62 per cent respondents had high cosmopolitaness.

In case of beneficiaries, 52.50 per cent of the respondents had medium cosmopolitaness, whereas 28.75 per cent respondents had low and 18.75 per cent respondents had high cosmopolitaness.

Similarly, in case of non-beneficiaries, 51.88 per cent of the respondents had medium cosmopolitaness, while 25.62 per cent of them had low and 22.50 per cent respondents had high cosmopolitaness.

Table 4.30: Distribution of the respondents according to their cosmopolitaness

Sl. No.	Cosmopolitaness	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Once in a month	46	28.75	41	25.62	87	27.19
2	Once in a week	84	52.50	83	51.88	167	52.19
3	Twice or more in a week	30	18.75	36	22.50	66	20.62
Total		160	100	160	100	320	100

F – Frequency, % - percentage

It can be concluded that majority of the respondents of both groups had low to medium level of cosmopolitaness.

Cosmopolitaness measures the frequency of visits of the individuals and their purpose of visit to the particular place. Person who visit more to the outside of their locality have more information about new technologies and innovation. They are broader in awareness knowledge as compared to those who visits less frequently.

The findings are similar to the findings reported by Sanjeev and Saroj (2014) and Kumari and Laxmikant (2015).

4.1.5.4 Achievement motivation

The data presented in Table 4.31 indicates that out of the total, 63.75 per cent of the respondents had medium level of achievement motivation, followed by 25.00 per cent had low and 11.25 per cent had high level of achievement motivation.

In case of beneficiaries, 63.12 per cent of the respondents had medium level of achievement motivation, whereas 26.25 per cent had low and 10.63 per cent had high level of achievement motivation.

Similarly, in case of non-beneficiaries, 64.37 per cent of the respondents had medium level of achievement motivation, followed by 23.75 per cent had low and 11.88 per cent had high level of achievement motivation.

The calculated 'Z' value for achievement motivation was -4.859 which was found to be non-significant. Thus the earlier stated null hypothesis that there is no difference between achievement motivation of beneficiaries and non-beneficiaries

was not rejected. Hence, it can be concluded that there is no difference between achievement motivation of beneficiaries and non-beneficiaries respondents.

Table 4.31: Distribution of the respondents according to their achievement motivation

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	42	26.25	38	23.75	80	25.00
2	Medium	101	63.12	103	64.37	204	63.75
3	High	17	10.63	19	11.88	36	11.25
	Total	160	100	160	100	320	100
	Mean	15.11		14.19			
	SD	1.26		1.27			
‘Z’ value = -4.859 NS							

NS = Non-significant

It can be concluded that majority of the beneficiaries and non-beneficiaries respondents had medium level of achievement motivation.

The possible reason might be that most of them were from poor economic background and had huge familial responsibility on their shoulders. Based on the inner urge, one will be interested to increase the income and profit from the business they run. Every individual once aware of things in their social milieu, automatically their motivation level would rise due to increasing interest to fulfill the needs like desire for recognition, security, food and wealth etc.

The observation is in line with findings of Boruah *et al.* (2015) and Fartyal and Rathore (2014).

4.1.5.5 Economic motivation

The data presented in Table 4.32 and Fig. 4.13 were subjected to percentage distribution of the respondents according to their economic motivation. The data indicates that out of the total, majority of the respondents (75.00%) had medium level of economic motivation, followed by 20.62 per cent had low and 4.38 per cent had high level of economic motivation.

In case of beneficiaries, majority of the respondents (75.62%) had medium level of economic motivation, while 20.00 per cent had low and 4.38 per cent had high level of economic motivation.

Table 4.32: Distribution of the respondents according to their economic motivation

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	32	20.00	34	21.25	66	20.62
2	Medium	121	75.62	119	74.37	240	75.00
3	High	7	4.38	7	4.38	14	4.38
	Total	160	100	160	100	320	100
	Mean	25.03		20.67			
	SD	1.95		1.85			
‘Z’ value = -0.264 NS							

NS = Non-significant

Similarly, in case of non-beneficiaries, majority of the respondents (74.37%) had medium level of economic motivation, followed by 21.25 per cent had low and 4.38 per cent had high level of economic motivation.

The calculated ‘Z’ value for economic motivation was -0.264 which was found to be non-significant. Thus the earlier stated null hypothesis that there is no difference between economic motivation of beneficiaries and non-beneficiaries was not rejected. Therefore, it can be concluded that there is no difference between economic motivation of beneficiaries and non-beneficiaries respondents.

It can be comprehended from the above results that the majority of the respondents had medium economic motivation in case of both beneficiaries and non-beneficiaries respondents.

This may be due to the reason that the respondents were still not thinking agriculture as a business and the irregular climatic and marketing factors made them not to think about rainfall profits. Moreover the uncertainty level in the respondents was increasing day-by-day because of these factors. Hence, such trend was noticed.

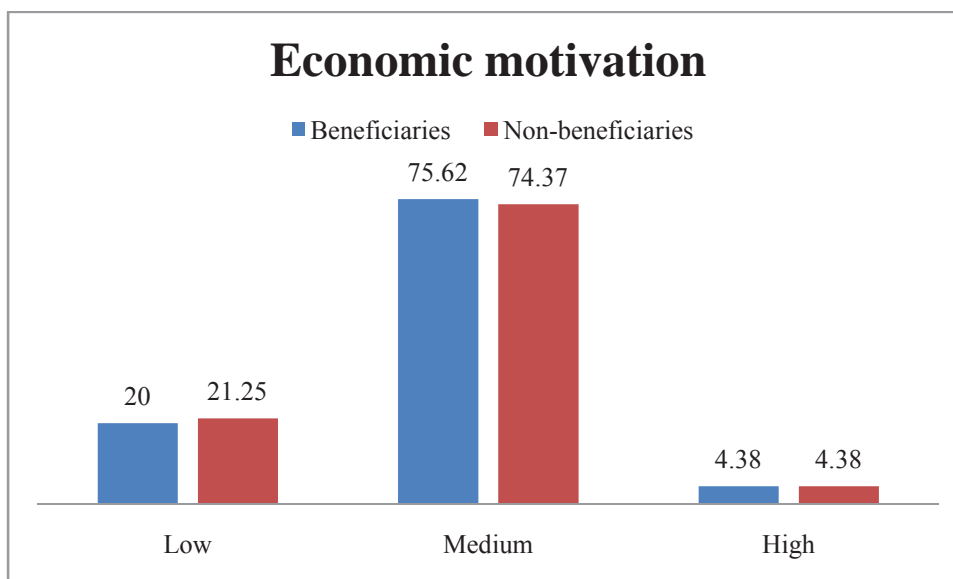


Fig. 4.13: Distribution of the respondents according to their economic motivation

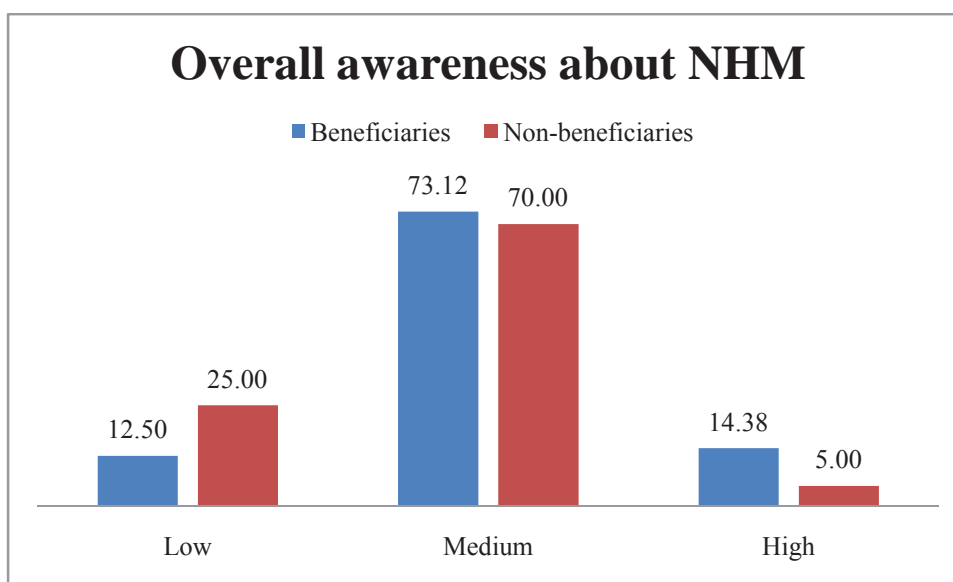


Fig. 4.14: Distribution of the respondents according to their overall awareness about NHM

This is in conformity with the results by Jha (2012), Kumari and Laxmikant (2015) and Salunkhe *et al.* (2012).

4.2 Awareness of turmeric growers about NHM

The data regarding distribution of the respondents according to awareness about different components of NHM are presented in Table 4.33. As per the mean per cent score order was obtained it is observed that the highest awareness score was obtained in case of “Have you heard about NHM ever before” (rank I), followed by “Are you aware of the implementation agency NHM Scheme in your area” (rank II), “Do you know under NHM is there is a provision for assisting the farmer for construction of green house under protected cultivation to cope with the climatic variability” (rank III), “Are you aware NHM is promoting the high density planting of banana with tissue culture planting material” (rank IV), “Do you know the main objective of NHM is to enhance Horticulture production, improve nutritional security and income support to farmer” (rank V), “Are you aware NHM is to create more employment opportunity for skilled and unskilled person” (rank VI), “Do you know NHM is promoting organic farming as well to maintain the ecological balance by providing input subsidy in terms of kind”(rank VII), “Are you aware of that legal document of land property is necessary criteria for selecting a farmer for the beneficiaries of NHM” (rank VIII), “Are you aware the mandates of NHM is to take up Post Harvest Management especially by processing of perishable horticulture product” (rank IX), “Are you aware the strategy of NHM is to minimize the risk of small and marginal farmers through crop diversification towards orchards and plantation crop” (rank X), “Do you know under NHM there is provision for exposure visit to mainland under training and capacity building programme to update the latest technical knowledge” (rank XI), “Are you aware that NHM is also assisting the scheme of beekeeping for pollination support” (rank XII), “Are you aware under NHM cash and kind subsidies are provided for rejuvenating the old orchards of fruits and plantation crops” (rank XIII), “Are you aware the minimum area required to take up the schemes of establishment of new garden is 0.1 ha and maximum of 4.0 ha per beneficiaries” (rank XIV) and

Table 4.33: Distribution of the respondents according to their awareness about NHM

Sl. No.	Aspects	Respondents				Total	
		Beneficiaries		Non-beneficiaries			
		MPS	Rank	MPS	Rank		
1	Have you heard about NHM ever before.	100	I	78.12	I	89.06	I
2	Are you aware of the implementation agency of NHM Scheme in your area.	98.13	II	71.87	II	85.00	II
3	Do you know that the main objective of NHM is to enhance Horticulture production, improve nutritional security and income support to farmer.	96.25	III	38.75	V	67.50	V
4	Are you aware that NHM is to create more employment opportunity for skilled and unskilled person.	80.00	V	16.88	VII	48.44	VI
5	Are you aware that the mandates of NHM is to take up Post Harvest Management especially by processing of perishable horticulture product	61.88	VIII	5.00	X	33.44	IX
6	Are you aware that the strategy of NHM is to minimize the risk of small and marginal farmers through crop diversification towards orchards and plantation crop	48.13	X	3.75	XI	25.94	X
7	Are you aware that the minimum area required to take up the schemes of establishment of new garden is 0.1 ha and maximum of 4.0 ha per beneficiaries.	13.75	XIV	1.25	XIII	7.50	XIV
8	Are you aware that the financial assistance will be provided to the schemes in three years in ratio of 60:20:20.	9.38	XV	0.00	XIV	5.00	XV
9	Are you aware that legal document of land property is necessary criteria for selecting a farmer for the beneficiaries of NHM.	58.13	IX	10.63	VIII	34.38	VIII
10	Do you know under NHM there is a provision for assisting the farmer for construction of green house under protected cultivation to cope with the climatic variability.	85.63	IV	53.13	IV	69.38	III
11	Are you aware that NHM is promoting the high density planting of banana with tissue culture planting material.	78.75	VI	58.75	III	68.75	IV
12	Are you aware that NHM is also assisting the scheme of beekeeping for pollination support.	22.50	XII	3.75	XI	13.13	XII
13	Do you know that NHM is promoting organic farming as well to maintain the ecological balance by providing input subsidy in terms of kind.	65.63	VII	19.38	VI	42.50	VII
14	Do you know under NHM there is provision for exposure visit to mainland under training and capacity building programme to update the latest technical knowledge.	42.50	XI	8.13	IX	25.31	XI
15	Are you aware that under NHM cash and kind subsidies are provided for rejuvenating the old orchards of fruits and plantation crops.	20.00	XIII	1.88	XII	10.94	XIII

MPS- Mean Percent Score

“Are you aware the financial assistance will be provided to the schemes in three years in ratio of 60:20:20” (rank XV).

As regards to beneficiaries, as per the mean per cent score order they obtained it is observed that the highest awareness score was obtained in case of “Have you heard about NHM ever before” (rank I), followed by “Are you aware of the agency implementation NHM Scheme in your area” (rank II), “Do you know the main objective of NHM is to enhance Horticulture production, improve nutritional security and income support to farmer” (rank III), “Do you know under NHM is there is a provision for assisting the farmer for construction of green house under protected cultivation to cope with the climatic variability” (rank IV), “Are you aware NHM is to create more employment opportunity for skilled and unskilled person” (rank V), “Are you aware NHM is promoting the high density planting of banana with tissue culture planting material” (rank VI), “Do you know NHM is promoting organic farming as well to maintain the ecological balance by providing input subsidy in terms of kind” (rank VII), “Are you aware the mandates of NHM is to take up Post Harvest Management especially by processing of perishable horticulture product” (rank VIII), “Are you aware of that legal document of land property is necessary criteria for selecting a farmer for the beneficiaries of NHM” (rank IX), “Are you aware the strategy of NHM is to minimize the risk of small and marginal farmers through crop diversification towards orchards and plantation crop” (rank X), “Do you know under NHM there is provision for exposure visit to mainland under training and capacity building programme to update the latest technical knowledge” (rank XI), “Are you aware that NHM is also assisting the scheme of beekeeping for pollination support” (rank XII), “Are you aware under NHM cash and kind subsidies are provided for rejuvenating the old orchards of fruits and plantation crops” (rank XIII), “Are you aware the minimum area required to take up the schemes of establishment of new garden is 0.1 ha and maximum of 4.0 ha per beneficiaries” (rank XIV) and “Are you aware the financial assistance will be provided to the schemes in three years in ratio of 60:20:20” (rank XV).

As regards to non-beneficiaries, as per the mean per cent score order they obtained it is observed that the highest awareness score was obtained in case of

“Have you heard about NHM ever before” (rank I), followed by “Are you aware of the agency implementation NHM Scheme in your area” (rank II), “Are you aware NHM is promoting the high density planting of banana with tissue culture planting material” (rank III), “Do you know under NHM is there is a provision for assisting the farmer for construction of green house under protected cultivation to cope with the climatic variability” (rank IV), “Do you know the main objective of NHM is to enhance Horticulture production, improve nutritional security and income support to farmer” (rank V), “Do you know NHM is promoting organic farming as well to maintain the ecological balance by providing input subsidy in terms of kind” (rank VI), “Are you aware NHM is to create more employment opportunity for skilled and unskilled person” (rank VII), “Are you aware of that legal document of land property is necessary criteria for selecting a farmer for the beneficiaries of NHM” (rank VIII), “Do you know under NHM there is provision for exposure visit to mainland under training and capacity building programme to update the latest technical knowledge” (rank IX), “Are you aware the mandates of NHM is to take up Post Harvest Management especially by processing of perishable horticulture product” (rank X), “Are you aware that NHM is also assisting the scheme of beekeeping for pollination support” and “Are you aware the strategy of NHM is to minimize the risk of small and marginal farmers through crop diversification towards orchards and plantation crop” (rank XI), “Are you aware under NHM cash and kind subsidies are provided for rejuvenating the old orchards of fruits and plantation crops” (rank XII), “Are you aware the minimum area required to take up the schemes of establishment of new garden is 0.1 ha and maximum of 4.0 ha per beneficiaries” (rank XIII) and “Are you aware the financial assistance will be provided to the schemes in three years in ratio of 60:20:20” (rank XIV).

The data on overall awareness of the respondents about different components of NHM are given in Table 4.34 and Fig. 4.14. It can be seen from the findings that out of the total, majority of the respondents (71.56%) had medium level of awareness of the scheme, followed by 18.75 per cent had low level of awareness and 9.69 per cent had high level of awareness about the existence and functioning of NHM scheme.

In case of beneficiaries, 73.12 per cent of the respondents had medium level of awareness, while 14.38 per cent had high level of awareness and 12.50 per cent had low level of awareness about the NHM scheme.

Table 4.34: Distribution of the respondents according to their overall awareness about NHM

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	20	12.50	40	25.00	60	18.75
2	Medium	117	73.12	112	70.00	229	71.56
3	High	23	14.38	8	5.00	31	9.69
	Total	160	100	160	100	320	100
	Mean	8.83		4.21			
	SD	2.79		1.89			
‘Z’ value = 1.959 NS							

NS = Non-significant

Similarly, in case of non-beneficiaries, 70.00 per cent of the respondents had medium level of awareness, followed by 25.00 per cent low level of awareness and 5.00 per cent high level of awareness about different components of NHM.

The calculated ‘Z’ value for awareness about NHM was 1.959 which was found to be non-significant. Thus the earlier stated null hypothesis that there is no difference between awareness about NHM of beneficiaries and non-beneficiaries was not rejected. Therefore, it can be concluded that there is no difference between awareness about NHM of beneficiaries and non-beneficiaries.

It can be concluded that the majority of the beneficiaries had high to medium level of awareness and in case of non-beneficiaries low to medium level of awareness about NHM scheme.

The probable reason might be that cent per cent of the beneficiaries respondents were aware about NHM scheme and about who motivated them to join the scheme. This reveals the enthusiasm and interest shown by the members regarding the scheme.

The result is in accordance with the results of Rai and Singh (2008) and Jaganatham *et al.* (2009).

The data presented in Table 4.35 reveals about the attitude of beneficiaries towards NHM. As per the mean score order it was observed that the highest score was obtained in case of “NHM is a boon for small and marginal farmers” (rank I), followed by “NHM would generate new employment opportunity in rural area” (rank II) “NHM helps the farmers to improve personal and socio-economic status” (rank III), “NHM encourage the farmers to take proper care of their orchards and nursery” (rank IV), “NHM helps to farmers to adopt high value input” (rank V), “The small scale industries in fruit processing will be enhance in rural area due to NHM” (rank VI), “There is little work and more of propaganda done by the NHM” (rank VII), “Increase of fruit production due to NHM will create marketing problem of fruit” (rank VIII), “Activities implemented under NHM are not relevant to the needs of small and marginal farmers” (rank IX), “Big farmers only could derive the benefits given under various schemes of NHM” (rank X), “Due to lack of proper publicity majority of the farmers have not received the benefit give the benefit given under NHM” (rank XI) and “The procedure of getting the benefits from NHM is complex” (rank XII).

The data regarding attitude of non-beneficiaries towards NHM are presented in Table 4.36. As per the mean score order it was observed that the highest score was obtained in case of “NHM would generate new employment opportunity in rural area” (rank I), followed by “NHM encourage the farmers to take proper care of their orchards and nursery” (rank II), “NHM helps the farmers to improve personal and socio-economic status” and “Increase of fruit production due to NHM will create marketing problem of fruit” (rank III), “The small scale industries in fruit processing will be enhance in rural area due to NHM” (rank IV), “NHM helps to farmers to adopt high value input” (rank V), “Due to lack of proper publicity majority of the farmers have not received the benefit give the benefit given under NHM” (rank VI) “NHM is a boon for small and marginal farmers” (rank VII), “Activities implemented under NHM are not relevant to the needs of small and marginal farmers” (rank VIII), “There is little work and more of propaganda done by the NHM” (rank IX), “Big farmers only could derive the benefits given under various schemes of NHM” (rank X) and “The procedure of getting the benefits from NHM is complex” (rank XI).

4.3 Attitude of turmeric growers towards NHM

Table 4.35: Distribution of the beneficiaries according to their attitude towards NHM

Sl. No.	Statements	Beneficiaries						MPS	Mean score	Rank
		SA F(%)	A F(%)	UD F(%)	DA F(%)	SDA F(%)				
1	NHM would generate new employment opportunity in rural area.	67 (41.88)	73 (45.62)	20 (12.50)	0 (0.00)	0 (0.00)	85.87	4.29	II	
2	NHM encourage the farmers to take proper care of their orchards and nursery.	35 (21.88)	100 (62.50)	25 (15.62)	0 (0.00)	0 (0.00)	81.25	4.06	IV	
3	Activities implemented under NHM are not relevant to the needs of small and marginal farmers.	32 (20.00)	62 (38.75)	60 (37.50)	5 (3.12)	1 (0.63)	74.88	3.74	IX	
4	The procedure of getting the benefits from NHM is complex.	6 (3.75)	33 (20.63)	60 (37.50)	53 (33.12)	8 (5.00)	57.00	2.85	XII	
5	NHM helps the farmers to improve personal and socio-economic status.	44 (27.50)	86 (53.75)	29 (18.12)	1 (0.63)	0 (0.00)	81.63	4.08	III	
6	Increase of fruit production due to NHM will create marketing problem of fruit.	29 (18.12)	86 (53.75)	39 (24.37)	3 (1.88)	3 (1.88)	76.88	3.84	VIII	
7	Due to lack of proper publicity majority of the farmers have not received the benefit given under NHM.	18 (11.25)	78 (48.75)	43 (26.87)	20 (12.50)	1 (0.63)	71.38	3.58	XI	
8	NHM helps to farmers to adopt high value input.	41 (25.63)	80 (50.00)	39 (24.37)	0 (0.00)	0 (0.00)	80.25	4.01	V	
9	The small scale industries in fruit processing will be enhance in rural area due to NHM	50 (31.25)	61 (38.12)	48 (30.00)	1 (0.63)	0 (0.00)	80.00	4.00	VI	
10	Big farmers only could derive the benefits given under various schemes of NHM.	42 (26.25)	45 (28.12)	55 (34.38)	18 (11.25)	0 (0.00)	73.88	3.69	X	
11	There is little work and more of propaganda done by the NHM.	33 (20.62)	80 (50.00)	41 (25.63)	5 (25.62)	1 (0.63)	77.38	3.87	VII	
12	NHM is a boon for small and marginal farmers.	79 (49.38)	77 (48.12)	4 (2.50)	0 (0.00)	0 (0.00)	89.38	4.47	I	

SA-Strongly agree, A-Agree, UD-Undecided, DA-Disagree, SDA-Strongly disagree

Table 4.36: Distribution of the non-beneficiaries according to their attitude towards NHM

Sl. No.	Statements	Non-beneficiaries						MPS	Mean score	Rank
		SA F(%)	A F(%)	UD F(%)	DA F(%)	SDA F(%)				
1	NHM would generate new employment opportunity in rural area.	14 (8.75)	119 (74.37)	27 (16.88)	0 (0.00)	0 (0.00)	78.38	3.92	I	
2	NHM encourage the farmers to take proper care of their orchards and nursery.	3 (1.88)	127 (79.37)	29 (18.12)	1 (0.63)	0 (0.00)	76.50	3.83	II	
3	Activities implemented under NHM are not relevant to the needs of small and marginal farmers.	7 (4.38)	56 (35.00)	79 (49.37)	18 (11.25)	0 (0.00)	66.50	3.33	VII	
4	The procedure of getting the benefits from NHM is complex.	0 (0.00)	28 (17.50)	88 (55.00)	44 (27.50)	0 (0.00)	58	2.90	XI	
5	NHM helps the farmers to improve personal and socio-economic status.	9 (5.62)	106 (66.25)	35 (21.88)	10 (6.25)	0 (0.00)	74.25	3.71	III	
6	Increase of fruit production due to NHM will create marketing problem of fruit.	18 (11.25)	85 (53.12)	46 (28.75)	11 (6.88)	0 (0.00)	74.25	3.69	III	
7	Due to lack of proper publicity majority of the farmers have not received the benefit give the benefit given under NHM.	5 (3.13)	90 (56.25)	60 (37.50)	5 (3.13)	0 (0.00)	71.88	3.59	VI	
8	NHM helps to farmers to adopt high value input.	10 (6.25)	89 (55.62)	57 (35.63)	4 (2.50)	0 (0.00)	73.13	3.66	V	
9	The small scale industries in fruit processing will be enhance in rural area due to NHM	10 (6.25)	93 (58.12)	54 (33.75)	3 (1.88)	0 (0.00)	73.75	3.69	IV	
10	Big farmers only could derive the benefits given under various schemes of NHM.	5 (3.12)	32 (20.00)	71 (44.38)	48 (30.00)	4 (2.50)	58.25	2.91	X	
11	There is little work and more of propaganda done by the NHM.	2 (1.25)	44 (27.50)	63 (39.37)	51 (31.88)	0 (0.00)	59.63	2.98	IX	
12	NHM is a boon for small and marginal farmers.	7 (4.37)	74 (46.25)	75 (46.88)	4 (2.50)	0 (0.00)	70.50	3.53	VII	

SA-Strongly agree, A-Agree, UD-Undecided, DA-Disagree, SDA-Strongly disagree

The data presented in Table 4.37 and Fig. 4.15 reveals that out of total, majority of the respondents (74.38%) had favourable attitude towards NHM, followed by 18.43 per cent of them neutral attitude and only 7.19 per cent of the respondents had most favourable attitude. None of them had unfavourable and most unfavourable attitude towards NHM.

Table 4.37: Distribution of the respondents according to their overall attitude towards NHM

Sl. No.	Category	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Most unfavourable (up to 21.60 score)	0	0.00	0	0.00	0	0.00
2	Unfavourable (21.61 to 31.20 score)	0	0.00	0	0.00	0	0.00
3	Neutral (31.20 to 40.80 score)	1	0.63	58	36.25	59	18.43
4	Favourable (40.81 to 50.40 score)	138	86.25	100	62.50	238	74.38
5	Most favourable (above 50.41 score)	21	13.12	2	1.25	23	7.19
Total		160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, 86.25 per cent of the beneficiaries had favourable attitude towards NHM, whereas 13.12 per cent had most favourable attitude and 0.63 per cent of the beneficiaries had neutral attitude. None of them had unfavourable and most unfavourable attitude towards NHM.

Similarly, in case of non-beneficiaries, majority of the respondents (62.50%) had favourable attitude towards NHM, followed by 36.25 per cent had neutral attitude and 1.25 per cent of them had most favourable attitude. None of the respondents had unfavourable and most unfavourable attitude towards NHM.

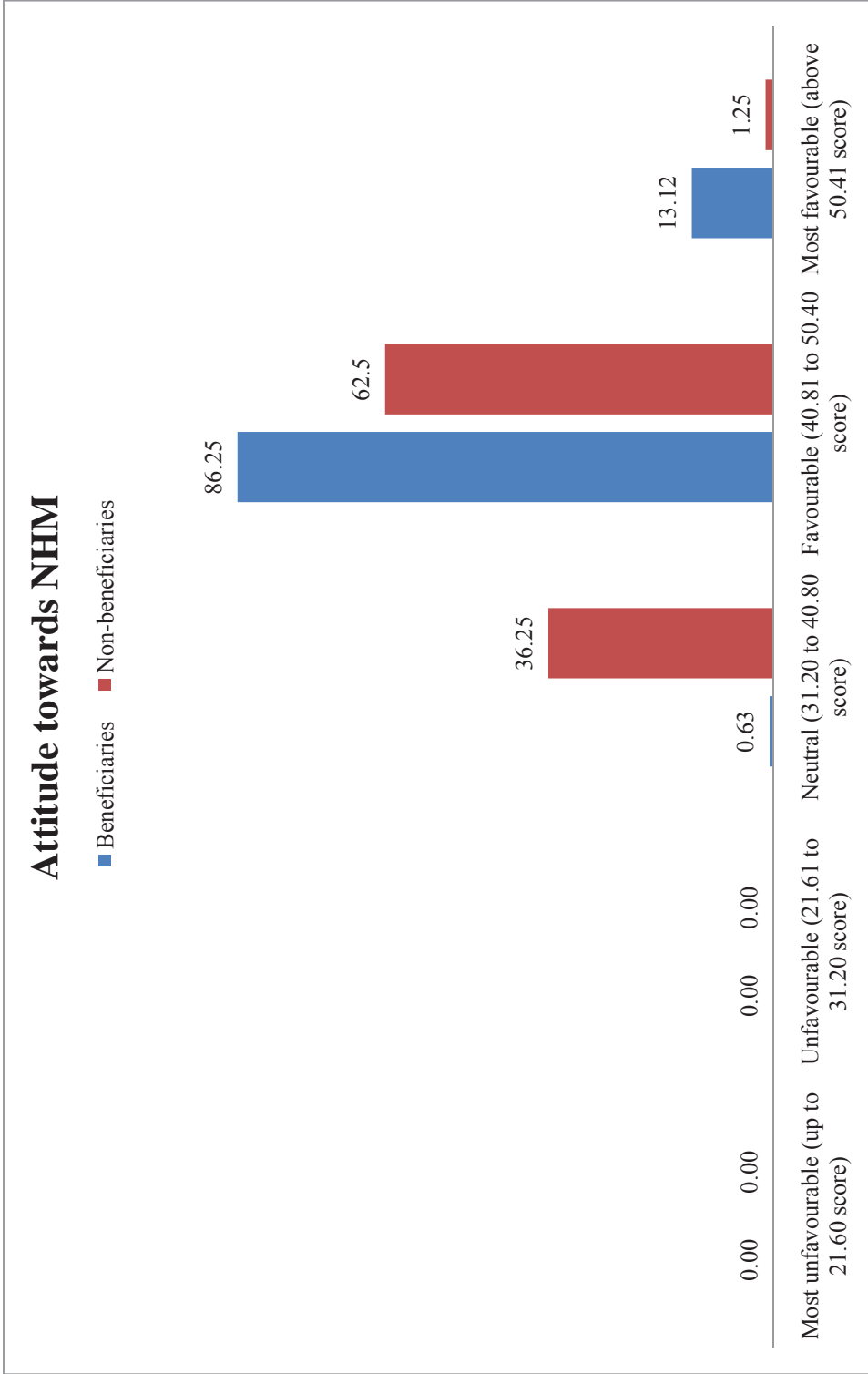


Fig. 4.15: Distribution of the respondents according to their attitude towards NHM

It can be concluded that most of the beneficiaries respondents had favourable to most favourable attitude, while most of the non-beneficiaries had a favourable to neutral attitude.

The probable reason might be that the beneficiaries who had registered for the work had high knowledge about the programme and after understanding the social advantages of the job they developed a favourable attitude. The non-beneficiaries knew that the programme ensure work to those registered for work irrespective of caste or class. Since the programme expects everybody to perform manual labour and work shoulder to shoulder with those who are lower in caste and class the non-beneficiaries had a neutral attitude.

This finding was in agreement with the findings of Pagaria (2014), Salunkhe *et al.* (2012), Sonawane and Neware (2012).

4.4 Knowledge of beneficiaries and non-beneficiaries respondents regarding improved turmeric cultivation practices

Beneficiaries

Knowledge is defined as a body understood information possessed by individual or by a culture. It is further explained that knowledge is the part of a persons information, which is in accordance with established fact. In the present investigation, the knowledge level of selected beneficiaries of NHM regarding turmeric cultivation was assessed and presented in Table 4.38. The findings reveal that majority of the respondents had full knowledge about improved cultivation practices like recommended varieties (91.25%), methods of planting (90.00%), ploughing and field preparation (79.38%), irrigation management (74.38%), inter-cropping (73.75%), harvesting time and methods (71.88%), recommended seed rate (60.00%), balance dose of fertilizers (57.50%), Earthin up operation (56.88%), Application of FYM (54.38%), seed treatment (50.00%), insect-pest management (46.25%), recommended spacing (45.00%), disease management (16.88%), chemicals for weed control (6.88%) and use of mulching (4.37%).

However, it was observed that the majority of the respondents had partial knowledge of improved cultivation practices like disease management (68.75%), recommended spacing (55.00%), application of FYM (45.62%), seed treatment and

insect-pest management (45.00%), earthing up operation (43.12%), balance dose of fertilizers (42.50%), recommended seed rate (40.00%), harvesting time and methods (28.12%), inter-cropping (26.25%), irrigation management (25.62%), ploughing and field preparation (20.62%), chemicals for weed control (18.12%) and methods of planting (10.00%).

It was also found that the majority of the respondents had no knowledge about improved cultivation practices like use of mulching (95.63%), chemicals for weed control (75.00%), disease management (14.37%), recommended variety and insect-pest management (8.75%) and seed treatment (5.00%).

Non-beneficiaries

The knowledge of turmeric cultivation of selected non-beneficiaries was assessed and presented in Table 4.38. The data reveals that majority of the respondents had full knowledge about improved cultivation practices like useful method of planting (86.25%), recommended varieties (81.25%), ploughing and field preparation (75.62%), irrigation management (73.13%), inter-cropping (71.88%), harvesting time and methods (63.75%), earthing up operation (51.88%), recommended seed rate (51.25%), recommended spacing and application of FYM (41.88%), balance dose of fertilizers (38.75%), seed treatment (30.00%), insect-pest management (24.37%), disease management (13.12%) and mulching (1.88%).

However, it was observed that the majority of the respondents had partial knowledge of improved cultivation practices like disease management (74.38%), insect-pest management (64.38%), balance dose of fertilizers (61.25%), seed treatment (60.62%), recommended spacing and application of FYM (58.12%), recommended seed rate (48.75%), earthing up operation (48.12%), harvesting time and methods (36.25%), inter-cropping (28.12%), irrigation management (26.88%), ploughing and field preparation (24.38%), chemicals for weed control (21.88%) and method of planting (13.75%).

Table 4.38: Distribution of the respondents according to their knowledge regarding improved turmeric cultivation practices

Sl. No.	Practices	Respondents					
		Beneficiaries			Non-beneficiaries		
		No knowledge	Partial knowledge	Full knowledge	No knowledge	Partial knowledge	Full knowledge
F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	
1	Field preparation	0 (0.00)	33 (20.62)	127 (79.38)	0 (0.00)	39 (24.38)	121 (75.62)
2	Improved variety	14 (8.75)	0 (0.00)	146 (91.25)	30 (18.75)	0 (0.00)	130 (81.25)
3	Seed rate	0 (0.00)	64 (40.00)	96 (60.00)	0 (0.00)	78 (48.75)	82 (51.25)
4	Method of planting	0 (0.00)	16 (10.00)	144 (90.00)	0 (0.00)	22 (13.75)	138 (86.25)
5	Spacing	0 (0.00)	88 (55.00)	72 (45.00)	0 (0.00)	93 (58.12)	67 (41.88)
6	Seed treatment	8 (5.00)	72 (45.00)	80 (50.00)	15 (9.38)	97 (60.62)	48 (30.00)
7	Earthing up	0 (0.00)	69 (43.12)	91 (56.88)	0 (0.00)	77 (48.12)	83 (51.88)
8	Inter-cropping	0 (0.00)	42 (26.25)	118 (73.75)	0 (0.00)	45 (28.12)	115 (71.88)
9	Mulching	153 (95.63)	0 (0.00)	7 (4.37)	157 (98.12)	0 (0.00)	3 (1.88)
10	Application of FYM	0 (0.00)	73 (45.62)	87 (54.38)	0 (0.00)	93 (58.12)	67 (41.88)
11	Application of fertilizers	0 (0.00)	68 (42.50)	92 (57.50)	0 (0.00)	98 (61.25)	62 (38.75)
12	Chemicals for weed control	120 (75.00)	29 (18.12)	11 (6.88)	119 (74.37)	35 (21.88)	6 (3.75)
13	Water management	0 (0.00)	41 (25.62)	119 (74.38)	0 (0.00)	43 (26.88)	117 (73.12)
14	Insect-pest control	14 (8.75)	72 (45.00)	74 (46.25)	18 (11.25)	103 (64.38)	39 (24.37)
15	Disease control	23 (14.37)	110 (68.75)	27 (16.88)	20 (12.50)	119 (74.38)	21 (13.12)
16	Harvesting stage	0 (0.00)	45 (28.12)	115 (71.88)	0 (0.00)	58 (36.25)	102 (63.75)

Figures in parentheses indicate the percentage

It was also found that the majority of the respondents had no knowledge about improved cultivation practices like mulching (98.12%), chemical for weed control (74.37%), recommended variety (18.75%), disease management (12.50%), insect-pest management (11.25%), seed treatment (9.38%).

4.4.1 Comparison between beneficiaries and non-beneficiaries respondents with respect to their knowledge regarding improved turmeric cultivation practices

The data presented in Table 4.39 and Fig. 4.16 reveals the difference between beneficiaries and non-beneficiaries respondents regarding turmeric cultivation. The calculated 'Z' value for field preparation was 0.801 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence it can be concluded that there is no difference between beneficiaries and non-beneficiaries with respect to field preparation.

The calculated 'Z' value for improved variety was 2.904 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding improved variety.

The calculated 'Z' value for seed rate was 1.983 which was found to be significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries in relation to seed rate.

The calculated 'Z' value for method of planting was 1.035 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding method of planting.

Table 4.39: Comparison between beneficiaries and non-beneficiaries respondents with respect to their knowledge regarding improved turmeric cultivation practices

Sl. No.	Practices	Mean value		'Z' value
		Beneficiaries	Non-beneficiaries	
1	Field preparation	1.794	1.756	0.801
2	Improved variety	1.825	1.625	2.904**
3	Seed rate	1.612	1.513	1.983*
4	Method of planting	1.900	1.863	1.035
5	Spacing	1.450	1.419	0.562
6	Seed treatment	1.450	1.206	3.677**
7	Earthing up	1.569	1.519	0.896
8	Inter-cropping	1.738	1.719	0.375
9	Mulching	0.088	0.038	1.984*
10	Application of FYM	1.544	1.419	2.248*
11	Application of fertilizers	1.575	1.388	3.406**
12	Chemicals for Weed control	0.319	0.294	0.394
13	Water management	1.744	1.725	0.372
14	Insect-pest control	1.375	1.131	3.552**
15	Disease control	1.025	1.006	0.310
16	Harvesting stage	1.713	1.638	1.412

**0.01 level of probability

*0.05 level of probability

The calculated 'Z' value for spacing was 0.562 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and no-beneficiaries in relation to spacing.

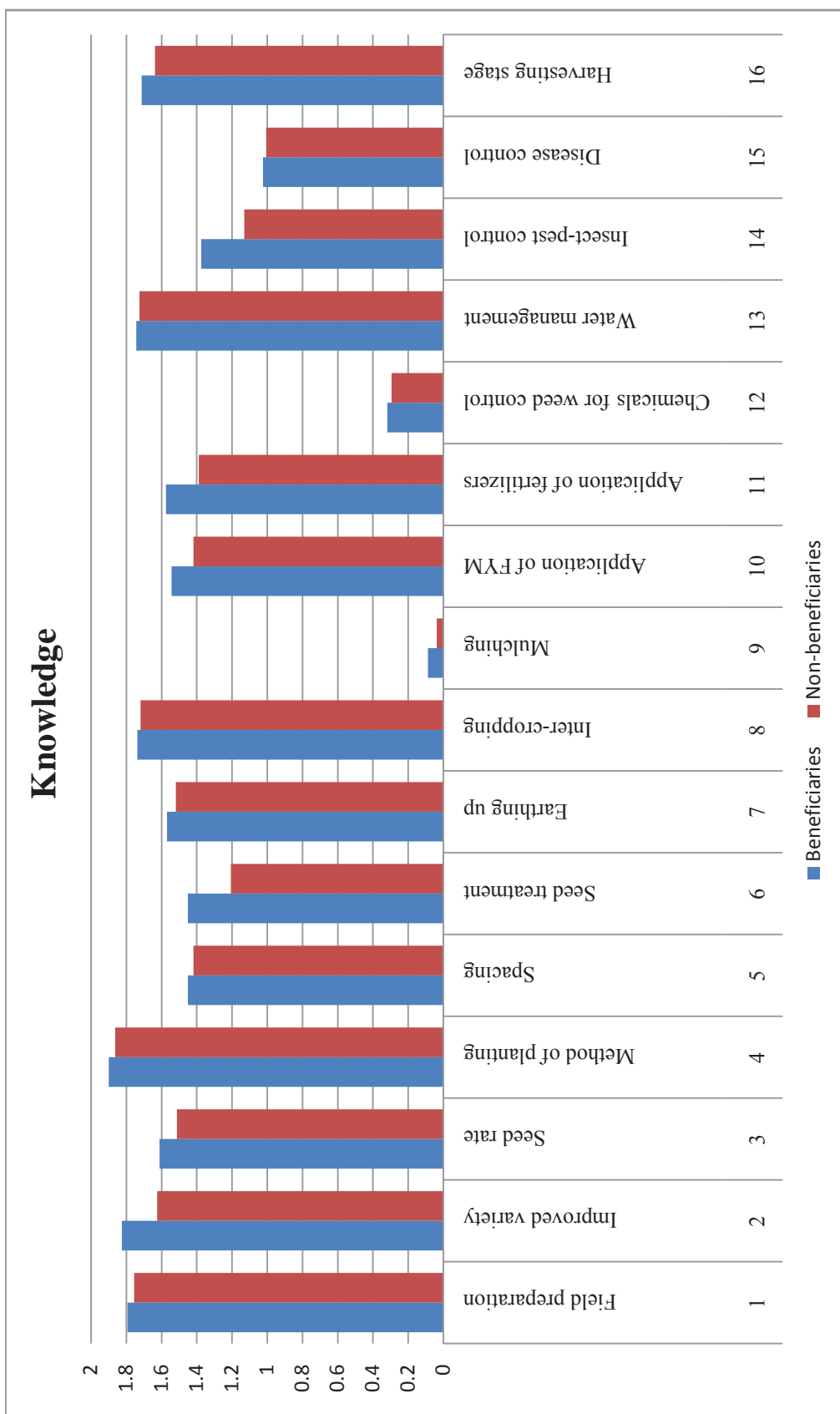


Fig. 4.16: Distribution of the respondents according to their knowledge regarding improved turmeric cultivation practices

The calculated 'Z' value for seed treatment was 3.677 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding seed treatment.

The calculated 'Z' value for earthing up was 0.896 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries with respect to earthing up.

The calculated 'Z' value for inter-cropping was 0.375 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries in relation to inter-cropping.

The calculated 'Z' value for mulching was 1.984 which was found to be significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries with respect to mulching.

The calculated 'Z' value for application of FYM was 2.248 which was found to be significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding application of FYM.

The calculated 'Z' value for Application of fertilizers was 3.406 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding application of fertilizers.

The calculated 'Z' value for chemicals of weed control was 0.394 which was found to be non-significant. Thus the earlier stated null hypotheses that there

is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries with respect to chemical of weed control.

The calculated 'Z' value for water management was 0.372 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries in relation to water management.

The calculated 'Z' value for insect-pest control was 3.552 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding insect-pest control.

The calculated 'Z' value for disease control was 0.310 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding disease control.

The calculated 'Z' value for harvesting stage was 1.412 which was found to be non-significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is accepted. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding harvesting stage.

The data presented in Table 4.40 reveals that out of total, 74.38 per cent of the respondents had medium knowledge about turmeric cultivation, followed by 20.00 per cent had low and 5.62 per cent of them had high knowledge level.

In case of beneficiaries, 73.12 per cent of the respondents had medium knowledge level, followed by 19.38 per cent had low knowledge and 7.50 per cent of them had high knowledge level.

Table 4.40: Distribution of the respondents according to their overall knowledge level about improved turmeric cultivation practices

Sl. No.	Knowledge level	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	31	19.38	33	20.63	64	20.00
2	Medium	117	73.12	121	75.62	238	74.38
3	High	12	7.50	6	3.75	18	5.62
	Total	160	100	160	100	320	100
	Mean	22.34		20.65			
	SD	2.39		1.96			
‘ Z ’ value = 3.712**							

** 0.01 level of probability

Similarly, in case of non-beneficiaries, 75.62 per cent of the respondents had medium knowledge, followed by 20.63 per cent had low and 3.75 per cent of them had high knowledge level.

The calculated ‘Z’ value for knowledge level was 3.712 which was found to be significant at 0.01 level of probability. Thus the earlier stated null hypothesis that there is no difference between knowledge level of beneficiaries and non-beneficiaries was rejected. Therefore, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding knowledge level of turmeric cultivation.

It can be concluded that the majority of the respondents had medium to high level of knowledge in case of beneficiaries, whereas it was medium to low level of knowledge in non-beneficiaries.

The probable reason for this trend may be the fact that the majority of the beneficiaries respondents were frequently taught the recommended cultivation practices regarding turmeric. This coupled with the respondents regular contact with extension personnel and scientists seeking advice and clarifying doubts on the topics they had heard through different sources made them to have more knowledge, whereas the non-beneficiaries respondents were not having frequent contact with the extension personnel and lack of information about turmeric production technology. Hence, they had low level of knowledge.

The high level trend of knowledge of the respondents in beneficiaries need to be maintained in the same manner, whereas it would be desirable to develop knowledge of non-beneficiaries respondents to high level by involving them in extension programme i.e. training and demonstration etc.

This results in line with the findings of Dubey *et al.* (2008), Pagaria (2014) and Jha (2012).

4.5 Adoption of beneficiaries and non-beneficiaries respondents regarding improved turmeric cultivation practices

Beneficiaries

Adoption is a decision to continue full use of an innovation. It may be defined as the integration of an innovation into a farmer's normal farming activity over an extended period of time. Thus adoption can be termed as a behavior response. It is the overt behavior of a farmer expressed in terms of aggregate adoption scores obtained by him with respect to turmeric cultivation practices. The data on adoption of improved cultivation practices of turmeric by the respondents are presented in Table 4.41. The findings reveal that majority of the respondents had fully adopted different aspects of improved cultivation practices like adoption of improved variety (100%), method of planting (85.62%), inter-cropping (61.25%), operation of earthing-up (56.88%), recommended seed rate (45.00%), recommended spacing and irrigation management (43.13%), ploughing and field preparation (40.62%), balance dose of fertilizers (39.38%), application of pesticide (30.62%), application of FYM as recommended (10.00%), chemical used for seed treatment (8.75%), application of fungicide (6.25%), use of mulching (3.12%) and recommended herbicide for weed control (0.62%).

However, it was observed that the majority of the respondents had partial adopted the improved cultivation practices like application of FYM as per recommendation (88.75%), harvesting time and methods (68.75%), balance dose of fertilizers (60.62%), ploughing and field preparation (59.38%), recommended spacing and irrigation management (56.88%), recommended seed rate (55.00%),

Table 4.41: Distribution of the respondents according to their adoption regarding improved turmeric cultivation practices

Sl. No.	Practices	Respondents					
		Beneficiaries			Non-beneficiaries		
		No adoption	Partial adoption	Full adoption	No adoption	Partial adoption	Full adoption
F (%)	F (%)	F (%)	F (%)	F (%)	F (%)		
1	Field preparation (One deep ploughing than 2-3 harrowing)	0 (0.00)	95 (59.38)	65 (40.62)	0 (0.00)	108 (67.50)	52 (32.50)
2	Improved variety (Roma, Prabha, Narendra haldi-land B.S.R.-2)	0 (0.00)	0 (0.00)	160 (100.00)	0 (0.00)	0 (0.00)	160 (100.00)
3	Seed rate (18-22 qha ⁻¹)	0 (0.00)	88 (55.00)	72 (45.00)	0 (0.00)	96 (60.00)	64 (40.00)
4	Method of planting (Ridge & furrow, 60-65 cm)	0 (0.00)	23 (14.38)	137 (85.62)	0 (0.00)	29 (18.12)	131 (81.88)
5	Spacing (30X20 cm)	0 (0.00)	91 (56.88)	69 (43.12)	0 (0.00)	93 (58.12)	67 (41.88)
6	Chemical used for Seed treatment	87 (54.37)	59 (36.88)	14 (8.75)	149 (93.13)	10 (6.25)	1 (0.62)
7	Earthing up (3-4 month after planting)	0 (0.00)	69 (43.12)	91 (56.88)	0 (0.00)	90 (56.25)	70 (43.75)
8	Inter-cropping (Ladies finger, chilli and coriander etc.)	0 (0.00)	62 (38.75)	98 (61.25)	1 (0.62)	65 (40.62)	94 (58.76)
9	Use of mulching	155 (96.87)	0 (0.00)	5 (3.12)	158 (98.75)	0 (0.00)	2 (1.25)
10	Application of FYM (20-25 tha ⁻¹)	2 (1.25)	142 (88.75)	16 (10.00)	0 (0.00)	149 (93.12)	11 (6.88)
11	Balance dose of fertilizers (N=150, P=100, K=120 kg ha ⁻¹)	0 (0.00)	97 (60.62)	63 (39.38)	2 (1.25)	100 (64.37)	58 (34.38)
12	Chemical methods of weed control	148 (92.50)	11 (6.88)	1 (0.62)	150 (93.75)	8 (5.00)	2 (1.25)
13	Water management (8-10 days intervals)	0 (0.00)	91 (56.88)	69 (43.12)	0 (0.00)	106 (66.25)	54 (33.75)
14	Application of pesticide	70 (43.75)	41 (25.63)	49 (30.62)	105 (65.62)	44 (27.50)	11 (6.88)
15	Application of fungicide	92 (57.50)	58 (36.25)	10 (6.25)	119 (74.37)	35 (21.88)	6 (3.75)
16	Harvesting stage (7-9 month)	0 (0.00)	110 (68.75)	50 (31.25)	0 (0.00)	136 (86.25)	24 (13.75)

Figures in parentheses indicate the percentage

operation of earthing up (43.12%), inter-cropping (38.75%), chemical used for seed treatment (36.88%), application of fungicide (36.25%), application of pesticide (25.63%), method of planting (14.38%) and application of herbicide for weed control (6.88%).

It was also found that the majority of the respondents had not adopted the cultivation practices like use of mulching (96.87%), application of herbicide for weed control (92.50%), application of fungicide (57.50%), chemical used for seed treatment (54.37%), application of pesticide (43.75%) and application of FYM as per recommended (1.25%).

Non-beneficiaries

The data on adoption of selected non-beneficiaries of turmeric production technology are presented in Table 4.41. The findings reveal that the majority of the respondents had full adopted different aspect of improved cultivation practices like adoption of improved variety (100%), method of planting (81.88%), inter-cropping (58.76%), operation of earthing up (43.75%), recommended spacing (41.88%), recommended seed rate (40.00%), balance dose of fertilizes (34.38%), irrigation management (33.75%), ploughin and field preparation (32.50%), harvesting time and methods (13.75%), application of FYM as per recommended and application of pesticide (6.88%), application of fungicide (3.75%), use of mulching and application of herbicide for weed control (1.25%) and recommended seed treatment (0.62%).

However, it was observed that the majority of the respondents had partial adopted the improved cultivation practices like application of FYM as per recommended (93.12%), harvesting time and methods (86.25%), ploughing and field preparation (67.50%), irrigation management (66.25%), balance dose of fertilizes (64.37%), recommended seed rate (60.00%), recommended spacing (58.12%), earthing up operation (56.25%), inter-cropping (40.62%), application of pesticide (27.50%), application of fungicide (21.88%), method of planting (18.12%), recommended seed treatment (6.25%), and application of herbicide for weed control.

It was also found that the majority of the respondents had not adopted the cultivation practices of turmeric like use of mulching (98.75%), application of

herbicide for weed control (93.75%), recommended seed treatment (93.12%), application of fungicide (74.37%), application of pesticide (65.62%), balance dose of fertilizers (1.25%) and inter-cropping (0.62%).

4.5.1 Comparison between beneficiaries and non-beneficiaries respondents with respect to adoption regarding improved turmeric cultivation practices

The data presentation in Table 4.42 and Fig. 4.17 depicts the difference between beneficiaries and non-beneficiaries regarding turmeric cultivation. The calculated 'Z' value for field preparation was 1.509 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding field preparation in turmeric.

The calculated 'Z' value for seed rate was 0.902 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding seed rate in turmeric.

The calculated 'Z' value for methods of planting was 0.907 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding method of planting in turmeric.

The calculated 'Z' value for spacing was 0.225 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding proper spacing in turmeric.

The calculated 'Z' value for seed treatment was 8.318 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding seed treatment in turmeric.

Table 4.42: Comparison between beneficiaries and non-beneficiaries respondents in relation to their adoption regarding improved turmeric cultivation practices

Sl. No.	Practices	Mean value		'Z' value
		Beneficiaries	Non-beneficiaries	
1	Field preparation	1.406	1.325	1.509
2	Improved variety	2.000	2.000	0
3	Seed rate	1.450	1.400	0.902
4	Method of planting	1.856	1.819	0.907
5	Spacing	1.431	1.419	0.225
6	Seed treatment	0.544	0.075	8.318**
7	Earthing up	1.569	1.438	2.361*
8	Inter-cropping	1.613	1.581	0.561
9	Use of mulching	0.063	0.025	1.145
10	Application of FYM	1.088	1.063	0.779
11	Balance dose of fertilizers	1.394	1.331	2.131*
12	Chemical methods of weed control	0.081	0.075	0.185
13	Water management	1.431	1.338	2.016*
14	Application of pesticide	0.869	0.413	5.500**
15	Application of fungicide	0.488	0.294	3.013**
16	Harvesting stage	1.306	1.138	3.630**

**Significant at 0.01 per cent level of probability

*Significant at 0.05 per cent level of probability

The calculated 'Z' value for earthing up was 2.361 which was found to be significant at 5 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding earthing up in turmeric.

The calculated 'Z' value for inter-cropping was 0.561 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected.

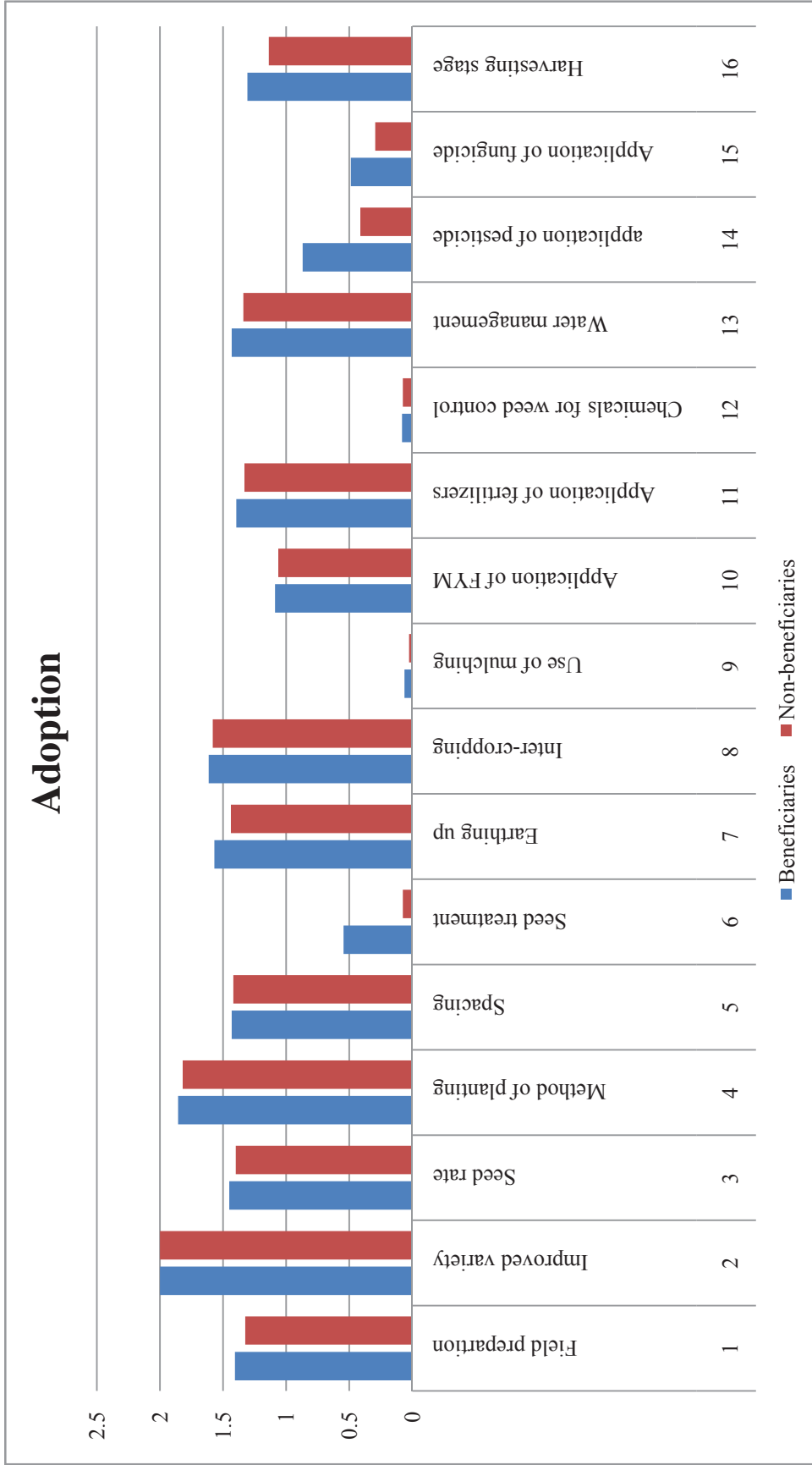


Fig. 4.11: Distribution of the respondents according to their adoption

Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding inter-cropping in turmeric.

The calculated 'Z' value for use of mulching was 1.145 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding use of mulching in turmeric.

The calculated 'Z' value for Application of FYM was 0.779 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding application of FYM in turmeric.

The calculated 'Z' value for application of fertilizers was 2.361 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding application of fertilizers in turmeric.

The calculated 'Z' value for chemical methods of weed control was 0.185 which was found to be non-significant. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is not rejected. Hence, it can be concluded that there is no difference between beneficiaries and non-beneficiaries regarding chemical methods of weed control in turmeric.

The calculated 'Z' value for water management was 2.016 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding water management in turmeric.

The calculated 'Z' value for application of pesticide was 5.500 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries

is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding application of pesticide in turmeric.

The calculated 'Z' value for application of fungicide was 3.013 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding application of fungicide in turmeric.

The calculated 'Z' value for harvesting stage was 3.630 which was found to be significant at 1 per cent level of probability. Thus the earlier stated null hypotheses that there is no difference between beneficiaries and non-beneficiaries is rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding harvesting stage in turmeric.

The data presented in Table 4.43 reveals that out of total respondents, 63.44 per cent had medium level of adoption, followed by 25.94 per cent low and 10.62 per cent high level of adoption.

Table 4.43: Distribution of the respondents according to their overall adoption level about improved turmeric cultivation practices

Sl. No.	Adoption level	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low	40	25.00	43	27.50	83	25.94
2	Medium	100	62.50	103	64.38	203	63.44
3	High	20	12.50	14	8.12	34	10.62
	Total	160	100	160	100	320	100
	Mean	18.00		15.88			
	SD	3.03		2.02			
'Z' value = 5.970**							

** 0.01 level of probability

In case of beneficiaries, most of the respondents (62.50%) had medium level of adoption, while 25.00 per cent of them had low and 12.50 per cent had high level of adoption.

Similarly, in case of non-beneficiaries, 64.38 per cent of the respondents had medium level of adoption, followed by 27.50 per cent had low and 8.12 per cent of them had high level of adoption.

The calculated 'Z' value for adoption level was 5.970 which was found to be significant at 0.01 level of probability. Thus the earlier stated null hypothesis that there is no difference between adoption level of beneficiaries and non-beneficiaries was rejected. Hence, it can be concluded that there is significant difference between beneficiaries and non-beneficiaries regarding adoption level.

It can be concluded that both the beneficiaries and non-beneficiaries respondents had medium level of adoption.

This trend might be due to the fact that the beneficiaries were having more exposure to the techniques of turmeric cultivation through participation in extension activities, close contact with department of agriculture and horticulture officials in learning the new skills.

Extension personnel of the study area should notice that for making further improvement in the adoption levels of beneficiaries there is a need to provide required finance through crop loans for turmeric cultivation, developing risk free, low cost and location specific technologies, need based trainings and supply of agricultural and horticulture information materials. The non-beneficiaries respondents also should be encouraged to participate in the training session and other extension activities so that they are convinced about turmeric production technology and might adopt them in the near future.

The results corroborates with the findings of Singh and Verma (2014), Sawant *et al.* (2012) and Ovhar and Wakle (2013).

4.6 Comparison of selected socio-economic characteristics of beneficiaries and non-beneficiaries respondents

Comparison between selected socio-economic characteristics of the beneficiaries and non-beneficiaries respondents was exercised to determine the impact of NHM on selected socio-economic characteristics of beneficiaries and non-beneficiaries respondents. The selected socio-economic characteristics viz., Annual income, Material possession, Extension contact, Mass media exposure, Scientific orientation, Risk orientation, Achievement motivation, Economic motivation, Awareness about NHM, Knowledge and Adoption. The 'Z' value of difference between the mean of two samples was found to be significant at 0.01 and 0.05 level of probability. Hence, there was significant difference between beneficiaries and non-beneficiaries respondents.

Table 4.44: Comparison between beneficiaries and non-beneficiaries respondents with respect to their selected socio-economic characteristics

Sl No.	Characteristics	Beneficiaries		Non-beneficiaries		'Z' value
		Mean	SD	Mean	SD	
1	Annual income	291065.	176019	185618.	98472.	4.246**
		52	.98	75	86	
2	Knowledge	22.34	2.39	20.65	1.96	3.712**
3	Adoption	18.00	3.03	15.88	2.02	5.970**
4	Extension contact	3.06	1.28	1.81	0.87	2.575*
5	Scientific orientation	25.47	1.65	21.07	2.43	2.575*
6	Risk orientation	24.94	1.77	20.73	1.85	2.575*
7	Material possession	3.98	0.83	3.81	0.87	1.777 NS
8	Mass media exposure	2.44	1.92	2.09	1.51	1.854 NS
9	Achievement motivation	15.11	1.26	14.19	1.27	-4.859 NS
10	Economic motivation	25.03	1.95	20.67	1.85	-0.264 NS
11	Awareness about NHM	8.83	2.79	4.21	4.21	1.959 NS

**Significant at 0.01 per cent level of probability

*Significant at 0.05 per cent level of probability

NS= Non-significant

The data presented in Table 4.44 shows highly significant difference between the beneficiaries and non-beneficiaries respondents with respect to their selected socio-economic variables viz., annual income, knowledge and adoption were found to be highly significant at 0.01 level of probability, whereas extension contact, scientific orientation and risk orientation were found to be significant at 0.05 level of probability and remaining variables like material possession, mass media exposure, achievement motivation, economic motivation and awareness were found to be non-significant.

Conclusion may be drawn on the basis of results shown in the table that a clear cut impact of NHM on socio-economic profile was found among the beneficiaries as compared with the non-beneficiaries respondents. The beneficiaries respondents of NHM were having much better socio-economic profile in comparison to non-beneficiaries respondents.

4.7 Existing cultivation practices of turmeric by the turmeric growers

4.7.1 Use of varieties in turmeric

The data regarding distribution of the respondents according to recommended varieties of turmeric are presented in Table 4.45 reveals that out of total, 46.88 per cent respondents were sowing Roma variety, followed by 29.68 per cent were sowing Narendra haldi-1, whereas 13.44 per cent B.S.R.-2 and 10.00 per cent of them were sowing Prabha variety of turmeric in the study area.

In case of beneficiaries, 80.00 per cent respondents were sowing Roma variety and 20.00 per cent of them were sowing Prabha variety of turmeric.

Similarly, in case of non-beneficiaries, 59.37 per cent respondents were sowing Narendra haldi-1, whereas 26.88 per cent B.S.R.-2 and 13.75 per cent of them were sowing Roma variety of turmeric.

It can be concluded that majority of the beneficiaries had adopted Roma variety and in case of non-beneficiaries, majority had adopted Narendra haldi-1.

4.7.2 Use of seed rate in turmeric

The data regarding distribution of the respondents according to use of recommended seed rate of turmeric as presented in Table 4.45 reveals that out of total, 57.50 per cent of the respondents had adopted below recommended seed rate

and 42.50 per cent of them adopted as per recommended seed rate of turmeric in study area.

Table 4.45: Distribution of the respondents according to their existing cultivation practices of turmeric

Sl. No.	Existing Practices	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
Use of varieties							
1	Roma	128	80.00	22	13.75	150	46.88
2	Prabha	32	20.00	0	0.00	32	10.00
3	Narendra Haldi-1	0	0.00	95	59.37	95	29.68
4	B.S.R.-2	0	0.00	43	26.88	43	13.44
Use of seed rate							
1	Up to 18 q ha ⁻¹	88	55.00	96	60.00	184	57.50
2	Above 18 q ha ⁻¹	72	45.00	64	40.00	136	42.50
Use of chemicals for seed treatment							
1	Mancozeb	25	15.62	8	5.00	33	10.31
2	Dithan, M-45	16	10.00	3	1.88	19	5.93
3	TrichodermaViridae	32	20.00	0	0.00	32	10.00
Use of fertilizers							
I Nitrogen							
1	Up to 120 kg ha ⁻¹	85	53.12	96	60.00	181	56.56
2	Above 120 kg ha ⁻¹	75	46.88	62	38.75	137	42.81
II Phosphorous							
1	Up to 80 kg ha ⁻¹	97	60.62	103	64.37	200	62.50
2	Above 80 kg ha ⁻¹	63	39.38	55	34.37	118	36.87
III Potassium							
1	Up to 100 kg ha ⁻¹	108	67.50	113	70.62	221	69.06
2	Above 100 kg ha ⁻¹	52	32.50	45	28.12	97	30.31
Use of herbicides							
1	Pendimethelin	7	4.37	8	5.00	15	4.68
2	Oxyfluorfen	5	3.12	2	1.25	7	2.18
Use of pesticides							
1	Chloropyriphos	62	38.75	48	30.00	110	34.37
2	Dimethoate	20	12.50	7	4.37	27	8.43
3	Phosphomidon	8	5.00	0	0.00	8	2.50
Use of fungicides							
1	Carbendazim	32	20.00	36	22.50	68	21.25
2	Mancozeb	20	12.50	5	3.12	25	7.81
3	Hexaconazol	16	10.00	0	0.00	16	5.00

F – Frequency, % - Percentage

In case of beneficiaries, 55.00 per cent of the respondents had adopted below recommended seed rate and 45.00 per cent respondents adopted as per recommended seed rate of turmeric.

Whereas, in case of non-beneficiaries, 60.00 per cent of the respondents had adopted below recommended seed rate and 40.00 per cent respondents adopted as per recommended seed rate.

It can be comprehended from the above data that majority of the beneficiaries and non-beneficiaries had adopted below recommended seed rate.

4.7.3 Use of fungicide for seed treatment

The data regarding distribution of the respondents according to use of chemicals for seed treatment of turmeric are presented in Table 4.45 reveals that out of total, 10.31 per cent of the respondents used mancozeb, whereas 10.00 per cent used trichoderma viridae and 5.93 per cent of them used dithem, M-45 for seed treatment of turmeric.

In case of beneficiaries, 20.00 per cent of the respondents used trichoderma viridae, followed by 15.62 per cent mancozed and 10.00 per cent of them used dithem, M-45.

Similarly, in case of non-beneficiaries, 5.00 per cent of the respondents used mancozed and 1.88 per cent of them used dithem, M-45 for seed treatment.

A close observation of the above results shows that majority of the beneficiaries used trichoderma viridae and in case of non-beneficiaries, it was used mancozed for seed treatment.

4.7.4 Use of fertilizer in turmeric

The data regarding distribution of the respondents according to application of fertilizers in turmeric are presented in Table 4.45 indicates that out of total, 56.56 per cent respondents used below recommended dose of nitrogenous fertilizers and 42.81 per cent used as per recommended dose of nitrogenous fertilizers, whereas regarding phosphoric fertilizers 62.50 per cent of the respondents used below recommended dose of phosphoric fertilizers and 36.87 per cent used as per recommended dose of phosphoric fertilizers. On other hand, regarding application of potassium fertilizers, 69.06 per cent respondents used

below recommended dose of potassium fertilizers and 30.31 per cent respondents used as per recommended dose of potassium fertilizers.

In case of beneficiaries, 53.12 per cent of the respondents used below recommended dose of nitrogenous fertilizers and 46.88 per cent respondents used as per recommended dose of nitrogenous fertilizers, whereas 60.62 per cent respondents used below recommended dose of phosphoric fertilizers and 39.38 per cent respondents used as per recommended dose of phosphoric fertilizers. On other hand, 67.50 per cent respondents used below recommended dose of potassium fertilizers and 32.50 per cent respondents used as per recommended dose of potassium fertilizers.

Similarly, in case of non-beneficiaries, 60.00 per cent of the respondents used below recommended dose of nitrogenous fertilizers and 38.75 per cent respondents used as per recommended dose of nitrogenous fertilizers, whereas 64.37 per cent respondents used below recommended dose of phosphoric fertilizers and 34.37 per cent respondents used as per recommended dose of phosphoric fertilizers. On other hand, 70.62 per cent respondents used below recommended dose of potassium fertilizers and 28.12 per cent respondents used as per recommended potassium fertilizers.

It can be concluded that majority of the beneficiaries and non-beneficiaries had used below recommended dose of nitrogenous, phosphoric and potassium fertilizers.

4.7.5 Weed control in turmeric

The data regarding distribution of the respondents according to weed control in turmeric by the chemical methods are presented in Table 4.45 reveals that out of total, 4.68 per cent of the respondents used pendimethelin and 2.18 per cent were used oxyfluorfen.

In case of beneficiaries, 4.37 per cent of the respondents used pendimethelin and 3.12 per cent were used oxyfluorfen.

Similarly, in case of non-beneficiaries, 5.00 per cent of the respondents were using pendimethelin and 1.25 per cent respondents used oxyfluorfen.

Hence, it can be concluded that majority of the beneficiaries and non-beneficiaries were using pendimethelin for weed control.

4.7.6 Insect-pest control in turmeric

The data regarding distribution of the respondents according to application of pesticide in turmeric are presented in Table 4.45 indicates that out of total, 34.37 per cent of the respondents used chloropyriphos, whereas 8.43 per cent respondents used dimethoate and 2.50 per cent respondents were used phosphomidon.

In case of beneficiaries, 38.75 per cent of the respondents used chloropyriphos, followed by 12.50 per cent respondents used dimethoate and 5.00 per cent respondents used phosphomidon.

Similarly, in case of non-beneficiaries, 30.00 per cent of the respondents used chloropyriphos and 4.37 per cent respondents used dimethoate.

Thus, it can be concluded that majority of the beneficiaries and non-beneficiaries were using chloropyriphos for insect-pest control.

4.7.7 Disease control in turmeric

The data regarding distribution of the respondents according to application of fungicide in turmeric are presented in Table 4.45 indicates that out of total, 21.25 per cent of the respondents had used carbomdenzim, whereas 7.81 per cent respondents used mancozed and 5.00 per cent respondents used hexaconazol.

In case of beneficiaries, 20.00 per cent of the respondents had used carbondenzim, followed by 12.50 per cent used mancozed and 10.00 per cent used hexaconazol.

Similarly, in case of non-beneficiaries, 22.50 per cent of the respondents had used carbondenzim and 3.12 per cent respondents used mancozeb.

It can be concluded that the majority of the beneficiaries and non-beneficiaries were used carbondenzim for disease control.

4.8 Benefits received by the beneficiaries under NHM

The respondents were inquired about whether they availed service under National Horticulture Mission. The results reveal that respondents availed services under various schemes. Data presented in Table 4.46 reveals that cent per cent of the respondents had availed service for turmeric rhizomes, followed by minikit (88.75%), fruit plants (78.13%), chilli and coriander seeds (59.38%), flowers (45.00%), zinger rhizomes (41.25%), mechanization (20.63%), pack house

(16.25%), creation of water tank and farm pond (11.88%), shed/net house (9.38%) and cold storage (5.00%). About 3.13 per cent of them had availed service of HRD-Training and only 2.50 per cent availed service of vermi-composting unit.

Table 4.46: Distribution of the beneficiaries according to benefits availed under National Horticulture Mission

Sl. No.	Components	F*	%
1	Fruit plants (Mango, Guava, Lemon etc.)	125	78.13
2	Turmeric rhizomes (seeds)	160	100
3	Zinger rhizomes (seeds)	66	41.25
4	Chilli and Coriander seeds	95	59.38
5	Flowers (Marigold, Tuberose, Gladiolus and Rose)	72	45.00
6	Creation of water tank and farm pond	19	11.88
7	Shed/Net House	15	9.38
8	Minikit (Trichodarma viridae and Michoriza)	142	88.75
9	Vermi-composting unit	4	2.50
10	HRD- Training	5	3.13
11	Mechanization (Tractor, Power Tiller etc.)	33	20.63
12	Pack House	26	16.25
13	Cold storage	8	5.00

*Data are based on multiple responses

4.9 Dependent variables

4.9.1 Socio-economic status

The data given in Table 4.47 and Fig. 4.18 reveals that out of total respondents, 50.31 per cent belonged to middle class, followed by lower middle class (34.38%), upper middle class (12.19%) and only upper class (3.12%). There is not a single respondent who belonged to lower class.

In case of beneficiaries, 56.88 per cent of the respondents belonged to middle class, followed by upper middle class (20.00%), lower middle class (18.12%) and upper class (5.00%). There is not a single respondent who belonged to lower class.

Table 4.47: Distribution of the respondents according to their socio-economic status

Sl. No.	Socio-economic status (SES)	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Lower class (up to 12 score)	0	0.00	0	0.00	0	0.00
2	Lower middle class (13 to 23 score)	29	18.12	81	50.62	110	34.38
3	Middle class (24 to 32 score)	91	56.88	70	43.75	161	50.31
4	Upper middle class (33 to 42 score)	32	20.00	7	4.38	39	12.19
5	Upper class (above 43 score)	8	5.00	2	1.25	10	3.12
Total		160	100	160	100	320	100

F – Frequency, % - percentage

Similarly, in case of non-beneficiaries, 50.62 per cent of the respondents belonged to lower middle class, followed by middle class (43.75%), upper middle class (4.38%) and only upper class (1.25%). There was not a single respondent who belonged to lower class.

It can be concluded that majority of the beneficiaries respondents belonged to upper middle to middle class and non-beneficiaries respondents belonged to middle to lower middle class.

The probable reason might be that there is improvement in independent variables such as social participation, farm power, material possession and land holding which in turn influenced socio-economic status of the respondents.

This result was in agreement with the findings of Shukla and Sharma (2010), Singh *et al.* (2009), Dubey *et al.* (2008), Roy *et al.* (2013) and Singh and Verma (2015).

4.2.2 Productivity

The data presented in Table 4.48 and Fig. 4.19 reveals that out of total respondents, 54.06 per cent had medium level of productivity, followed by 37.81 and 8.13 per cent of them had low and high level of productivity, respectively.

Table 4.48: Distribution of the respondents according to productivity of turmeric crop

Sl. No.	Productivity level	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Low (up to 150 q ha ⁻¹)	33	20.63	88	55.00	121	37.81
2	Medium (151 to 200 q ha ⁻¹)	109	68.12	64	40.00	173	54.06
3	High (above 200 q ha ⁻¹)	18	11.25	8	5.00	26	8.13
Total		160	100	160	100	320	100

F – Frequency, % - percentage

In case of beneficiaries, most of the respondents (68.12%) had medium level of productivity, while 20.63 and 11.25 per cent had low and high level of productivity, respectively.

Similarly, in case of non-beneficiaries, 55.00 per cent of the respondents had low level of productivity, followed by 40.00 and 5.00 per cent had medium and high level of productivity, respectively.

It was due to the fact that beneficiaries adopted certain practices under NHM scheme which improved the productivity were recommended seed rate, spacing, seed treatment, balance dose of fertilizer and harvesting time etc.

In case of non-beneficiaries, it was found that they adopted partially and not adopted most of the recommended practices. The non-beneficiaries followed the practices with their past experience and they have less interest in adopting latest and new technologies. Due to excess use of fertilizers and chemicals by the non-beneficiaries lead to decrease in the soil fertility and thus reduce the productivity.

This observation is in conformity with the conclusion of Kadam *et al.* (2013), Patel *et al.* (2015) and Shukla and Gupta (2016).

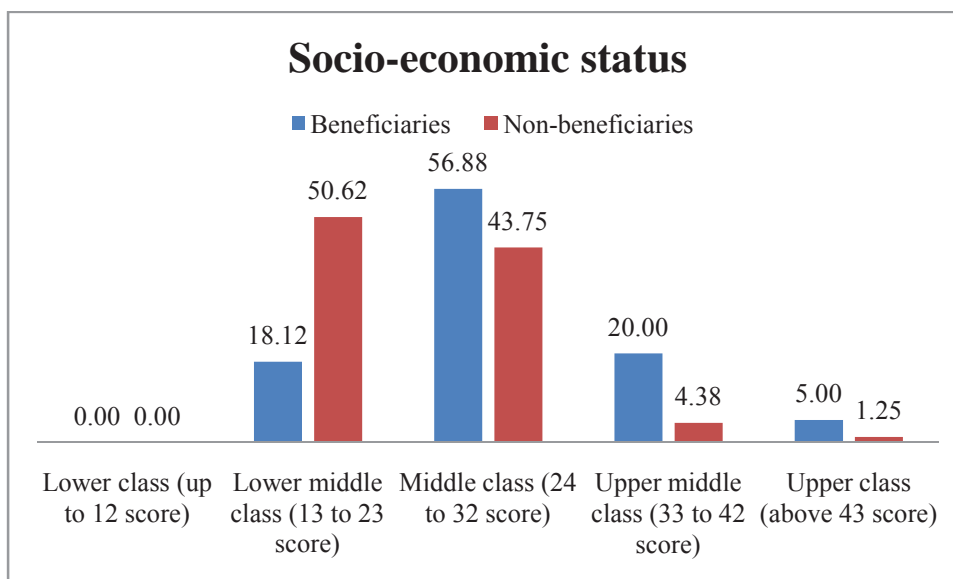


Fig. 4.18: Distribution of the respondents according to their socio-economic status

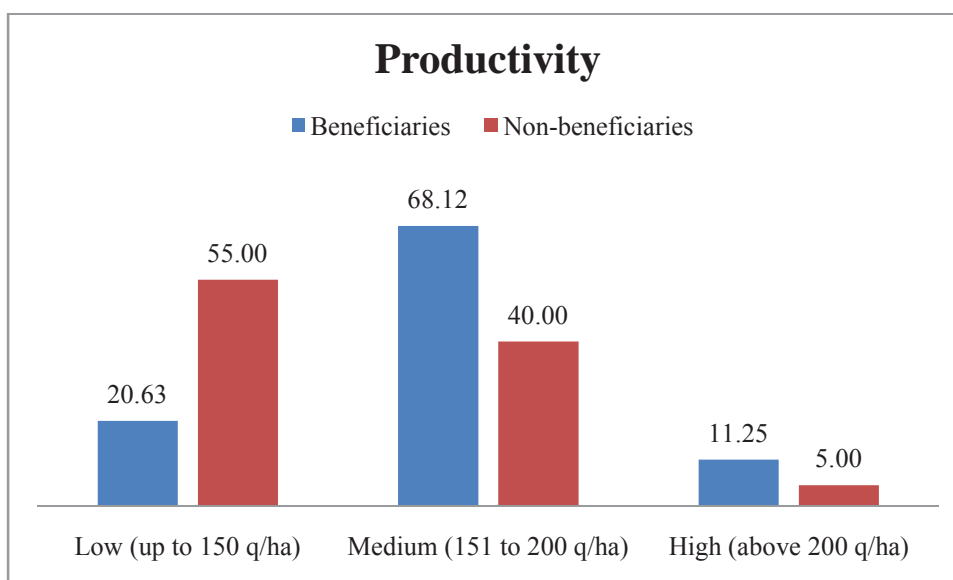


Fig. 4.19: Distribution of the respondents according to productivity of turmeric

4.9.3 Available land for turmeric cultivation

Regarding soil type of turmeric growing field, the data presented in Table 4.49 illustrates that out of total respondents, 34.06 per cent were occupied *Inceptisols* type of land, followed by 31.88 per cent *Vertisols* type of land and 30.62 per cent *Alfisols* type of land. Whereas, 3.44 per cent respondents occupied *Entisols* type of land.

In case of beneficiaries, 35.00 per cent of the respondents occupied *Alfisols* type of land, whereas 31.88 per cent respondents had *Inceptisols* and 30.00 per cent respondents *Vertisols* type of land and only 3.12 per cent respondents had occupied *Entisols* type of land.

Table 4.49: Distribution of the respondents according to soil type of turmeric growing field

Sl. No.	Types of soil	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Bhata (<i>Entisols</i>)	5	3.12	6	3.75	11	3.44
2	Matasi (<i>Inceptisols</i>)	51	31.88	58	36.25	109	34.06
3	Dorsa (<i>Alfisols</i>)	56	35.00	42	26.25	98	30.62
4	Kanhar(<i>Vertisols</i>)	48	30.00	54	33.75	102	31.88
Total		160	100	160	100	320	100

F – Frequency, % - percentage

Similarly, in case of non-beneficiaries, 36.25 per cent of the respondents were occupied by *Inceptisols* type of land, followed by 33.75 per cent respondents *Vertisols* and 26.25 per cent *Alfisols*. Whereas, 3.75 per cent of them occupied *Entisols* type of land.

It can be concluded that the majority of the beneficiaries were having *Alfisols* types of land, while non-beneficiaries were having *Inceptisols* types of land.

4.9.4 Different soil type of turmeric growing field

Regarding area under turmeric growing field of different soil types the data presented in Table 4.50 reveals that out of total, 41.48 per cent area of land falls

under the *Inceptisols*, followed by 29.40 per cent *Vertisols* and 26.25 per cent *Alfisols*, whereas 2.87 per cent area of land covered under *Entisol* type of land.

Table 4.50: Distribution of area of the respondents according to different soil type of turmeric growing field

Sl. No.	Types of soil	Area (ha)					
		Beneficiaries		Non-beneficiaries		Total	
		Area	%	Area	%	Area	%
1	Bhata(<i>Entisols</i>)	0.36	1.86	0.47	4.90	0.83	2.87
2	Matasi(<i>Inceptisols</i>)	8.04	41.64	3.95	41.14	11.99	41.48
3	Dorsa (<i>Alfisols</i>)	5.22	27.03	2.37	24.69	7.59	26.25
4	Kanhar(<i>Vertisols</i>)	5.69	29.47	2.81	29.27	8.50	29.40
	Total	19.31	100	9.60	100	28.91	100

In case of beneficiaries, 41.64 per cent area of land falls under *Inceptisols*, followed by 29.47 per cent *Vertisols* and 27.03 per cent *Alfisols*, whereas 1.86 per cent area of land covered under *Entisols* type of land.

Similarly, in case of non-beneficiaries, 41.14 per cent area of land covered under *Inceptisols*, followed by 29.27 per cent *Vertisols* and 24.69 per cent *Alfisols*, whereas 4.90 per cent area of land covered under *Entisols* type of land.

Further, it can be concluded that maximum area covered under *Inceptisol* types of land for turmeric cultivation in both groups.

4.9.5 Area under turmeric crop

The data presented in Table 4.51 reveals that out of total, 72.50 per cent of the respondents possessed medium size of area under turmeric cultivation, followed by 19.38 per cent had large size of area and 8.12 per cent of them had small size of area under turmeric cultivation.

In case of beneficiaries, 61.25 per cent of the respondents had medium size of area, while 30.00 and 8.75 per cent of them had large and small area under turmeric cultivation, respectively.

Similarly, in case of non-beneficiaries, 83.75 per cent of the respondents had medium size of area, whereas 8.75 and 7.50 per cent of them large and small area under turmeric cultivation, respectively.

Table 4.51: Distribution of the respondents according to area under turmeric

Sl. No.	Area under turmeric	Respondents					
		Beneficiaries		Non-beneficiaries		Total	
		F	%	F	%	F	%
1	Small	14	8.75	12	7.50	26	8.12
2	Medium	98	61.25	134	83.75	232	72.50
3	Large	48	30.00	14	8.75	62	19.38
	Total	160	100	160	100	320	100

F – Frequency, % - percentage

It can be concluded that majority of the respondents of both group beneficiaries and non-beneficiaries had medium size of area.

The reason might be that the small size of area under turmeric is too small to afford to the family need and also to earn income out of it. Medium and large size of area under turmeric is manageable and the respondents can adopt new technologies or improved practices/recommended for increasing the level of productivity.

4.9.6 Impact of NHM on socio-economic status, productivity and area of turmeric

The impact of NHM on beneficiaries has been studied in terms of change in socio-economic status, productivity and area under turmeric was measured in terms of per cent change.

Table 4.52: Impact of NHM on socio-economic status, productivity and area of turmeric

Sl. No.	Characteristics	Mean score		Mean difference	% change
		Beneficiaries	Non-beneficiaries		
1	Socio-economic status (score)	28.44	23.72	4.72	19.89
2	Productivity (qha ⁻¹)	192	152	40	26.31
3	Area (ha)	0.12	0.06	0.06	100

A cursory look from Table 4.52 reveals that the mean score of socio-economic status (28.44 score), productivity (192 qha⁻¹) and area (0.12 ha) of turmeric in NHM beneficiaries were higher than the mean score of socio-economic status (23.72 score) and productivity (152 qha⁻¹) and area (0.06 ha) of turmeric in non-beneficiaries.

Because of the availability of water for irrigation, it increased in productivity of the beneficiaries and thereby increased in the socio-economic status of the beneficiaries of NHM.

It could, therefore be stated that there was definite positive impact of NHM on the beneficiaries in terms of change in socio-economic status, productivity and area of turmeric.

4.9.7 Comparison between beneficiaries and non-beneficiaries respondents with respect to socio-economic status, productivity and area of turmeric

To determine the level of difference between beneficiaries and non-beneficiaries respondents related to their selected variables viz., socio-economic status, productivity and area of turmeric. The 'Z' test was applied and results are summarized in Table 4.53.

Table 4.53: Comparison between beneficiaries and non-beneficiaries respondents with respect to socio-economic status, productivity and area of turmeric

Sl. No.	Characteristics	Mean score		'Z' value
		Beneficiaries	Non-beneficiaries	
1	Socio-economic status	28.44	23.72	3.124**
2	Productivity	192	152	3.811**
3	Area	0.12	0.06	2.575*

** 0.01 level of probability

*0.05 level of probability

The calculated 'Z' value for socio-economic status was 3.124 which was found to be significant at 0.01 level of probability. Thus, the earlier stated null hypothesis that there is no difference between the socio-economic status of beneficiaries and non-beneficiaries was rejected. Therefore, it can be concluded

that there is significant difference between the socio-economic status of beneficiaries and non-beneficiaries respondents.

The calculated 'Z' value for productivity of turmeric was 3.124 which was found to be significant at 0.01 level of probability. Thus, the earlier stated null hypothesis that there is no difference between the productivity of turmeric in beneficiaries and non-beneficiaries was rejected. Therefore, it can be concluded that there is significant difference between the productivity of turmeric in beneficiaries and non-beneficiaries respondents.

The calculated 'Z' value for area of turmeric was 2.575 which was found to be significant at 0.05 level of probability. Thus, the earlier stated null hypothesis that there is no difference between the area of turmeric in beneficiaries and non-beneficiaries was rejected. Hence, it can be concluded that there is significant difference between the area of turmeric in beneficiaries and non-beneficiaries respondents.

4.10 Relationship between independent and dependent variables

4.10.1 Correlation analysis of profile characteristics with socio-economic status of the respondents

Beneficiaries respondents

It is evident from Table 4.54 that the correlation coefficient "r" between independent variables viz., education ($r=0.567$), social participation ($r=0.220$), house type ($r=0.706$), land holding ($r=0.471$), farm power ($r=0.292$), annual income ($r=0.509$), credit acquisition ($r=0.225$), material possession ($r=0.510$), cosmopolitanism ($r=0.441$) and knowledge level ($r=0.261$) had positive and highly significant relationship with socio-economic status of the beneficiaries respondents at 0.01 per cent level of probability and the variables, occupation ($r=0.191$), irrigation ($r=0.198$), extension contact ($r=0.162$), scientific orientation ($r=0.202$), risk orientation ($r=0.162$) and adoption level ($r=0.186$) had positive and significant relationship with socio-economic status of the beneficiaries respondents at 0.05 per cent level of probability.

Table 4.54: Relationship between profile characteristics with socio-economic status of the respondents

Sl.No.	Characteristics	Correlation Coefficient (r)	
		Beneficiaries	Non-beneficiaries
1	Age	-0.011	-0.084
2	Education	0.567**	0.366**
3	Caste	0.109	0.145
4	Family size	0.087	0.092
5	Family type	0.112	0.119
6	Social participation	0.220**	0.306**
7	Experience	0.064	-0.017
8	House type	0.706**	0.645**
9	Occupation	0.191*	0.278**
10	Land holding	0.471**	0.618**
11	Soil type	0.054	0.204*
12	Irrigation	0.198*	0.063
13	Farm power	0.292**	0.538**
14	Annual income	0.509**	0.711**
15	Credit acquisition	0.225**	0.359**
16	Material possession	0.510**	0.442**
17	Seed source	0.135	0.103
18	Storage	-0.128	-0.102
19	Processing and value addition	-0.126	0.156
20	Extension contact	0.162*	0.125
21	Mass media exposure	0.069	0.182*
22	Scientific orientation	0.202*	0.126
23	Risk orientation	0.162*	0.205*
24	Cosmopolitaness	0.441**	0.258**
25	Achievement motivation	0.092	0.110
26	Economic motivation	0.142	0.139
27	Awareness	0.104	0.148
28	Attitude	0.089	0.118
29	Knowledge level	0.261**	0.298**
30	Adoption level	0.186*	0.169*

* 0.05 level of probability (r) = 0.159

** 0.01 level of probability (r) = 0.208

The other variables such as age ($r=-0.011$), caste ($r=0.109$), family size ($r=0.087$), family type ($r=0.112$), experience ($r=0.064$), soil type ($r=0.054$), seed source ($r=0.135$), storage ($r=-0.128$), processing and value addition ($r=-0.126$), mass media exposure ($r=0.069$), achievement motivation ($r=0.092$), economic motivation ($r=0.142$), awareness ($r=0.104$) and attitude ($r=0.089$) had non-

significant relationship with socio-economic status of the beneficiaries respondents.

It can be concluded that the independent variables viz., education, social participation, house type, land holding, farm power, annual income, credit acquisition, material possession, cosmopolitaness and knowledge level had positive and highly significant association with socio-economic status of the beneficiaries respondents, while, occupation, irrigation, extension contact, scientific orientation, risk orientation and adoption had positive and significant association with socio-economic status of the beneficiaries respondents, which means that an increase in variable value results in an increase in the impact of socio-economic status of the beneficiaries respondents, while variables viz., caste, family size, family type, experience, soil type, seed source, mass media exposure, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with impact of socio-economic status of the beneficiaries respondents.

Variables like age, storage and processing and value addition had a negative and non-significant correlation with impact of socio-economic status of the beneficiaries respondents, which means that with increase and decrease in value of the variables results to non-significant change in impact of socio-economic status of beneficiaries respondents, which means that neither an increase nor decrease in the value will have an effect on the impact of socio-economic status of the beneficiaries.

Non-beneficiaries respondents

The correlation coefficient “r” between the independents variables viz., education ($r=0.366$), social participation ($r=0.306$), house type ($r=0.645$), occupation ($r=0.278$), land holding ($r=0.618$), annual income ($r=0.711$), credit acquisition ($r=0.359$), farm power ($r=0.538$), material possession ($r=0.442$), cosmopolitaness ($r=0.258$) and knowledge level ($r=0.298$) had positive and highly significant relationship with socio-economic status of the non-beneficiaries respondents at 0.01 level of probability and the variables soil type ($r=0.204$), mass media exposure ($r=0.182$), risk orientation ($r=0.205$) and adoption level ($r=0.169$) had significant relationship with socio-economic status of the non-beneficiaries

respondents at 0.05 level of probability. The other variables like age ($r=-0.084$), caste ($r=0.145$), family size ($r=0.092$), family type ($r=0.119$), experience ($r=-0.017$), irrigation ($r=0.063$), seed source ($r=0.103$), storage ($r=-0.102$), processing and value addition ($r=0.156$), extension contact ($r=0.125$), scientific orientation ($r=0.126$), achievement motivation ($r=0.110$), economic motivation ($r=0.139$), awareness ($r=0.148$) and attitude ($r=0.118$) had non-significant relationship with socio-economic status of the non-beneficiaries respondents.

It can be noticed that the independent variables viz., education, social participation, house type, occupation, land holding, annual income, credit acquisition, farm power, material possession, cosmopolitaness and knowledge level had a positive and highly significant correlation with impact of socio-economic status of the beneficiaries respondents, while the variables soil type, mass media exposure, risk orientation and adoption level had a positive and significant correlation with impact of socio-economic status of the non-beneficiaries respondents, which means that an increase in variable value results in an increase in the impact of socio-economic status of the non-beneficiaries respondents, while variables caste, family size, family type, irrigation, seed source, processing and value addition, extension contact, scientific orientation, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with impact of socio-economic status of the beneficiaries respondents.

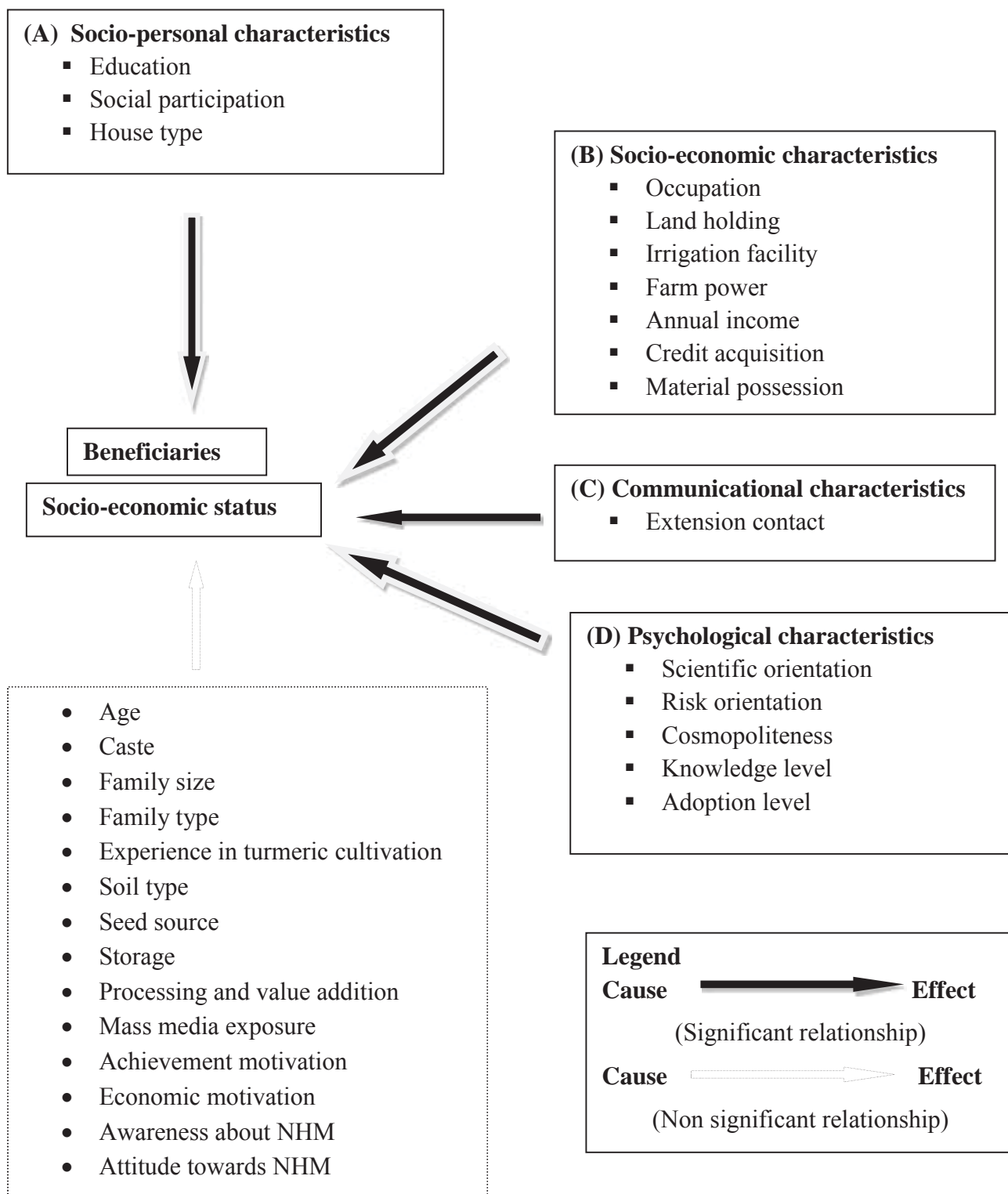


Fig4.14: Empirical model of the study area

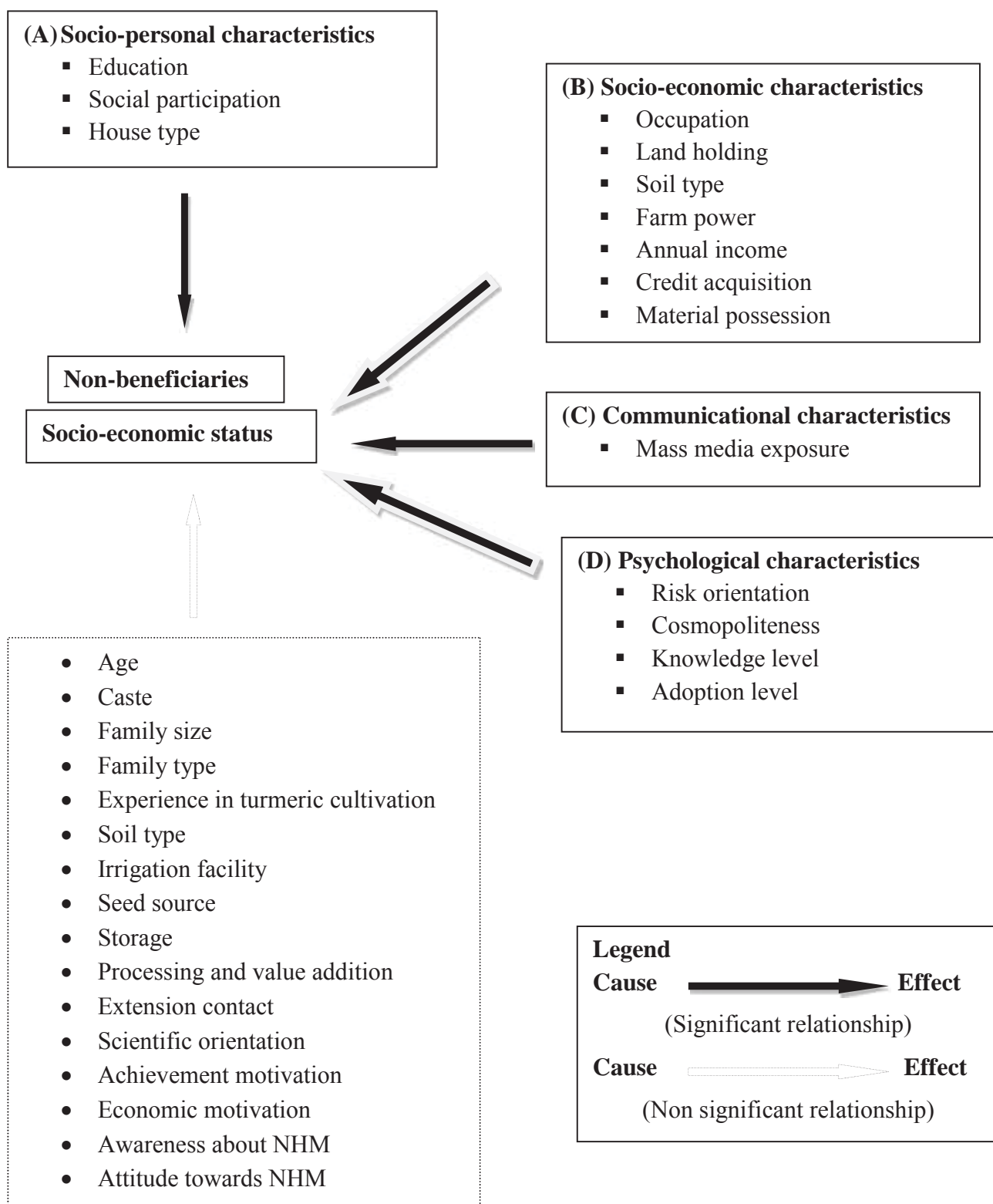


Fig4.15: Empirical model of the study area

Variables like age, experience and storage had a negative and non-significant correlation with impact of socio-economic status of the non-beneficiaries respondents, which means that with increase and decrease in value of the variables results to non-significant change in impact of socio-economic status of non-beneficiaries respondents, which means that neither an increase nor decrease in the value will have an effect on the impact of socio-economic status of the non-beneficiaries.

4.10.2 Correlation analysis of profile characteristics with productivity of turmeric

Beneficiaries respondents

It is apparent from Table 4.55 reveals that the correlation coefficient “r” between independent variables viz., education ($r=0.223$), land holding ($r=0.221$), soil type ($r=0.250$), irrigation ($r=0.232$), annual income ($r=0.241$), mass media exposure ($r=0.212$), risk orientation ($r=0.239$), knowledge level ($r=0.265$) and adoption level ($r=0.227$) had positive and highly significant relationship with productivity at 0.01 level of probability and the variables farm power ($r=0.172$), extension contact ($r=0.163$) and scientific orientation ($r=0.168$) were shown significant relationship with productivity at 0.05 level of probability.

The other variables such as age ($r=0.074$), caste ($r=-0.028$), family size ($r=-0.050$), family type ($r=-0.50$), social participation ($r=0.109$), experience ($r=0.004$), house type ($r=0.148$), occupation ($r=-0.113$), credit acquisition ($r=0.057$), material possession ($r=0.157$), seed source ($r=0.075$), storage ($r=0.028$), processing and value addition ($r=0.003$), cosmopolitaness ($r=0.115$), achievement motivation ($r=0.054$), economic motivation ($r=0.093$), awareness ($r=0.155$) and attitude ($r=0.037$) showed non-significant relationship with productivity.

It can be concluded that the independent variables viz., education, land holding, soil type, irrigation, annual income, mass media exposure, risk orientation, knowledge level and adoption level had a positive and highly significant correlation with productivity of turmeric, while variables farm power, extension contact and scientific orientation had a positive and significant correlation with productivity of turmeric, which means that an increase in variable

value results in an increase in the productivity of turmeric, while variables like age, social participation, experience, house type, credit acquisition, material possession, seed source, storage, processing and value addition, cosmopolitaness, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with productivity of turmeric.

Table 4.55: Relationship between profile characteristics with productivity of the turmeric

Sl.No.	Characteristics	Correlation Coefficient (r)	
		Beneficiaries	Non-beneficiaries
1	Age	0.074	-0.044
2	Education	0.223**	0.172*
3	Caste	-0.028	0.078
4	Family size	-0.050	-0.012
5	Family type	-0.050	-0.060
6	Social participation	0.109	0.194*
7	Experience	0.004	0.093
8	House type	0.148	0.071
9	Occupation	-0.113	-0.112
10	Land holding	0.221**	0.228**
11	Soil type	0.250**	0.203*
12	Irrigation	0.232**	0.271**
13	Farm power	0.172*	0.053
14	Annual income	0.241**	0.054
15	Credit acquisition	0.057	0.261**
16	Material possession	0.157	0.186*
17	Seed source	0.075	0.039
18	Storage	0.028	0.130
19	Processing and value addition	0.003	0.035
20	Extension contact	0.163*	0.038
21	Mass media exposure	0.212**	0.052
22	Scientific orientation	0.168*	0.215**
23	Risk orientation	0.239**	0.245**
24	Cosmopolitaness	0.115	0.145
25	Achievement motivation	0.054	0.100
26	Economic motivation	0.093	0.048
27	Awareness	0.155	0.043
28	Attitude	0.037	0.006
29	Knowledge level	0.265**	0.225**
30	Adoption level	0.227**	0.208**

* 0.05 level of probability (r) = 0.159

** 0.01 level of probability (r) = 0.208

Variables like caste, family size, family type and occupation had a negative and non-significant correlation with productivity of turmeric, which means that with increase and decrease in value of the variables results to non-significant change in productivity of turmeric, which means that neither an increase nor decrease in the value will have an effect on the productivity of turmeric.

Non-beneficiaries respondents

The correlation coefficient “r” between the independent variables viz., land holding ($r=0.228$), irrigation ($r=0.271$), credit acquisition ($r=0.261$), scientific orientation ($r=0.215$), risk orientation ($r=0.245$), knowledge level ($r=0.225$) and adoption level ($r=0.208$) had positive and highly significant relationship with productivity at 0.01 level of probability and the variables, education ($r=0.172$), social participation ($r=0.194$), soil type ($r=0.203$) and material possession ($r=0.186$) were shown significant relationship with productivity at 0.05 level of probability. The other variables like age ($r=-0.044$), caste ($r=0.078$), family size ($r=-0.012$), family type ($r=-0.060$), experience ($r=0.093$), house type ($r=0.071$), occupation ($r=-0.112$), farm power ($r=0.053$), annual income ($r=0.054$), seed source ($r=0.039$), storage ($r=0.130$), processing and value addition ($r=0.035$), extension contact ($r=0.038$), mass media exposure ($r=0.052$), cosmopolitaness ($r=0.145$), achievement motivation ($r=0.100$), economic motivation ($r=0.048$), awareness ($r=0.043$) and attitude ($r=0.006$) showed non-significant relationship with productivity.

It can be seen that the independent variables viz., land holding, irrigation, credit acquisition, scientific orientation, risk orientation, knowledge level and adoption level had positive and highly significant correlation with productivity of turmeric, while, education, social participation, soil type and material possession had positive and significant correlation with productivity of turmeric, which means that an increase in variable value results in an increase in the productivity of turmeric, while variables like caste, experience, house type, farm power, annual income, seed source, storage, processing and value addition, extension contact, mass media exposure, cosmopolitaness, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with productivity of turmeric.

Variables such as age, family size, family type and occupation had a negative and non-significant correlation with productivity of turmeric, which means that with increase and decrease in value of the variables results to non-significant change in productivity of turmeric, which means that neither an increase nor decrease in the value will have an effect on the productivity of turmeric.

4.11 Multiple regression analysis

4.11.1 Multiple regression analysis of profile characteristics with socio-economic status of the respondents

Beneficiaries respondents

The result of regression analysis in Table 4.56 shows that the value of coefficient of determination R^2 was 0.881 which means that 88 per cent of total variation in the socio-economic status was explained by selected 30 variables. The unexplained variation 12 per cent may be attributed due to other factors.

The results of regression analysis presented in Table 4.56 shows that out of 30 variables education, caste, social participation, occupation, house type, farm power, annual income, material possession, and economic motivation contributed highly significantly at 0.01 level of probability and family size, annual income, and mass media exposure contributed significantly at 0.05 level of probability towards socio-economic status of the respondents. Remaining variables could not influence the socio-economic status of the respondents.

Thus, it can be concluded that education, caste, family size, social participation, occupation, house type, farm power, annual income, material possession, mass media exposure and economic motivation influence the socio-economic status of the respondents.

Non-beneficiaries respondents

The result of regression analysis in Table 4.56 shows that the value of coefficient of determination R^2 was 0.862 which means that 86 per cent of total variation in the socio-economic status was explained by selected 30 variables. The unexplained variation 14 per cent may be attributed due to other factors.

Table 4.56: Multiple regression analysis of profile characteristics with socio-economic status of the respondents

Sl.No.	Characteristics	Regression coefficient			
		Beneficiaries		Non-beneficiaries	
		'b' value	't' value	'b' value	't' value
1	Age	-0.002	0.741	0.082	1.059
2	Education	0.319	5.891**	0.219	4.283**
3	Caste	0.088	3.929**	0.127	3.232**
4	Family size	0.147	2.249*	0.131	2.341*
5	Family type	0.034	0.492	-0.017	0.163
6	Social participation	0.035	7.290**	0.128	2.551*
7	Experience	0.066	2.644	-0.040	-1.177
8	House type	0.319	6.283**	0.279	6.144**
9	Occupation	0.083	3.215**	0.120	2.990**
10	Land holding	0.217	1.593	0.046	1.006
11	Soil type	0.033	0.989	0.062	1.756
12	Irrigation	0.022	0.401	0.035	1.080
13	Farm power	0.127	4.819**	0.190	4.094**
14	Annual income	0.401	2.597*	0.212	2.566*
15	Credit acquisition	0.035	0.047	0.024	0.422
16	Material possession	0.306	10.305**	0.355	9.361**
17	Seed source	0.089	-0.945	-0.040	-1.145
18	Storage	-0.027	-0.209	-0.016	-0.107
19	Processing and value addition	0.021	0.176	-0.009	0.042
20	Extension contact	0.021	-0.232	0.033	0.964
21	Mass media exposure	0.076	2.009*	0.109	2.609**
22	Scientific orientation	-0.011	-1.004	-0.045	-0.480
23	Risk orientation	-0.018	-0.302	0.066	0.988
24	Cosmopolitaness	0.052	1.273	0.023	0.840
25	Achievement motivation	0.031	-0.739	-0.009	-0.001
26	Economic motivation	0.090	2.644**	-0.047	-1.511
27	Awareness	-0.029	-0.225	0.065	1.142
28	Attitude	0.006	0.321	-0.023	-0.562
29	Knowledge level	0.033	0.417	0.015	0.481
30	Adoption level	0.023	1.067	0.044	1.570

* 0.05 level of probability (t) = 1.975

** 0.01 level of probability (t) = 2.607

Beneficiaries - $R^2 = 0.881$

Non-beneficiaries - $R^2 = 0.862$

The results of regression analysis presented in Table 4.56 shows that out of 30 variables education, caste, house type, occupation, farm power, material possession and mass media exposure contributed highly significant at 0.01 level of probability and family size, social participation and annual income contributed significant at 0.05 level of probability towards socio-economic status of the

respondents. Remaining variables could not influence the socio-economic status of the respondents.

Thus, it can be concluded that education, caste, family size, social participation, house type, occupation, annual income, farm power, material possession and mass media exposure influence the socio-economic status of the respondents.

4.11.2 Model wise multiple regression analysis of independents variables for variation in the socio-economic status of beneficiaries respondents

Table 4.57: Model wise selected independents variables along with their predicting ability for variation in the socio-economic status of beneficiaries respondents

Model No.	Variables included in the models	R ²	'F' value
M ¹	X ₁₃	0.498	156.911** at 1,158 df
M ²	X ₁₃ ,X ₁₅	0.637	137.934** at 1,157 df
M ³	X ₁₃ ,X ₁₅ ,X ₆	0.770	174.029** at 1,156 df
M ⁴	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃	0.817	173.451** at 1,155 df
M ⁵	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃ ,X ₁₄	0.853	178.333** at 1,154 df
M ⁶	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃ ,X ₁₄ ,X ₁₁	0.870	171.071** at 153 df
M ⁷	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃ ,X ₁₄ ,X ₁₁ ,X ₂	0.886	169.599** at 1,152 df
M ⁸	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃ ,X ₁₄ ,X ₁₁ ,X ₂ ,X ₄	0.895	161.718** at 1,151 df
M ⁹	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃ ,X ₁₄ ,X ₁₁ ,X ₂ ,X ₄ ,X ₂₂	0.900	149.834** at 1,150 df
M ¹⁰	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃ ,X ₁₄ ,X ₁₁ ,X ₂ ,X ₄ ,X ₂₂ , X ₁₀	0.904	141.058** at 1,149 df
M ¹¹	X ₁₃ ,X ₁₅ ,X ₆ ,X ₃ ,X ₁₄ ,X ₁₁ ,X ₂ ,X ₄ ,X ₂₂ , X ₁₀ ,X ₁₇	0.908	132.359** at 1,148 df

** 0.01 level of probability

Note: X₁₃- House type, X₁₅- Material possession, X₆- Social participation, X₃- Education, X₁₁- Occupation, X₂- Caste, X⁴- Family size, X₂₂- Economic, X₁₀- Occupation and X₁₇- Mass media exposure.

Different models were tested for findings their predicting ability and to determine the best predictors for variation in the socio-economic status of beneficiaries respondents (Table 4.57). Every time one or more variables were dropped to find out the best model with lowest number of variables explaining highest variation in socio-economic status. Model-I revealed that 49 per cent socio-economic status can be explained by considered 30 independent variables and one dependent variable (socio-economic status) which have significant 'F' value at 1 per cent level. Model II, III, IV, V, VI, VII, VIII, IX, X and XI explained about contribution of socio-economic status as 63, 77, 81, 85, 87, 88, 89, 90, 90 and 90 per cent, respectively.

4.11.3 Model wise multiple regression analysis of independent variables for variation in the socio-economic status of non-beneficiaries respondents

Table 4.58: Model wise selected independents variables along with their predicting ability for variation in the socio-economic status of non-beneficiaries respondents

Model No.	Variables included in the models	R ²	'F' value
M ¹	X ₁₁	0.506	161.831** at 1,158 df
M ²	X ₁₁ ,X ₁₅	0.619	127.423** at 1,157 df
M ³	X ₁₁ ,X ₁₅ ,X ₃	0.698	120.209** at 1,156 df
M ⁴	X ₁₁ ,X ₁₅ ,X ₃ ,X ₁₄	0.748	115.325** at 1,155 df
M ⁵	X ₁₁ ,X ₁₅ ,X ₃ ,X ₁₄ ,X ₁₃	0.793	117.748** at 1,154 df
M ⁶	X ₁₁ ,X ₁₅ ,X ₃ ,X ₁₄ ,X ₁₃ ,X ₄	0.815	111.976** at 1,153 df
M ⁷	X ₁₁ ,X ₁₅ ,X ₃ ,X ₁₄ ,X ¹³ ,X ₄ ,X ₁₀	0.824	101.457** at 1,152 df
M ⁸	X ₁₁ ,X ₁₅ ,X ₃ ,X ₁₄ ,X ₁₃ ,X ₄ ,X ₁₀ ,X ₂	0.833	94.252** at 1,151 df
M ⁹	X ₁₁ ,X ₁₅ ,X ₃ ,X ₁₄ ,X ₁₃ ,X ₄ ,X ₁₀ ,X ₂ ,X ₆	0.840	87.483** at 1,150 df
M ¹⁰	X ₁₁ ,X ₁₅ ,X ₃ ,X ₁₄ ,X ₁₃ ,X ₄ ,X ₁₀ ,X ₂ ,X ₆ , X ₁₇	0.845	80.968** at 1,149 df

** Significant at 0.01 per cent level of probability

Note: X₁₁- Annual income, X₁₅- Material possession, X₃- Education, X₁₄- Farm power, X₁₃- House type, X₄- Family size, X₁₀- Occupation, X₂- Caste, X₆- Social participation and X₁₇ Mass media exposure.

Different models were tested for findings their predicting ability and to determine the best predictors for variation in the socio-economic status of non-beneficiaries respondents (Table 4.58). Every time one or more variables were dropped to find out the best model with lowest number of variables explaining highest variation in socio-economic status. Model I revealed that 50 per cent socio-economic status can be explained by considering 30 independent variables and one dependent variable (socio-economic status) which have significant 'F' value at 1 per cent level. Model II, III, IV, V, VI, VII, VIII, IX and X explained about contribution of socio-economic status as 61, 69, 74, 79, 81, 82, 83, 84 and 84 per cent, respectively.

4.12 Constraints and suggestions

4.12.1 Constraints faced by the turmeric growers about improved cultivation practices

The respondents were asked to express the various constraints as they faced during the course of adoption of improved turmeric cultivation practices.

It is observed from Table 4.59 indicates that 53.75 per cent respondents faced the constraints of unavailability of processing unit, followed by high cost of manure and fertilizers (34.06%), unavailability of labour at planting and harvesting time (26.88%), unavailability of storage facilities (23.75%), distant market for selling produce (22.81%), unavailability of fertilizers at proper time (22.50%), high cost of plant protection chemicals (22.19%), inadequate availability of FYM (19.06%), lack of proper market (18.44%), high wages of labour (17.81%), unavailability of seed rhizomes at proper time (16.88%) and high cost of seed rhizomes (6.56%).

Table 4.59: Distribution of the respondents according to their constraints during turmeric cultivation

Sl. No.	Constraints	F*	%	Rank
1	Unavailability of processing unit	172	53.75	I
2	High cost of seed rhizomes	21	6.56	XII
3	Lack of proper market	59	18.44	IX
4	High cost of chemical fertilizers	109	34.06	II
5	Unavailability of fertilizers at proper time	72	22.50	VI
6	Distant market for selling produce	73	22.81	V
7	Unavailability of seed rhizome at proper time	54	16.88	XI
8	High wages of labour	57	17.81	X
9	Unavailability of labour at planting and harvesting time	86	26.88	III
10	Inadequate availability of FYM	61	19.06	VIII
11	High cost of plant protection chemicals	71	22.19	VII
12	Unavailability of storage facilities	76	23.75	IV

*Data are based on multiple responses

4.12.2 Suggestions given by the turmeric growers about improved cultivation practices

Considering the constraints faced by the turmeric growers in cultivation of turmeric crop, they were asked to suggest the probable solutions in order to overcome the constraints and to increase the productivity of crop.

The data presented in Table 4.60 reveals that respondents suggested assured selling price of turmeric (43.13%), followed by processing unit should be available (26.88%), manure and fertilizers should be available at proper time (26.25%), storage facility should be available (25.31%), training facility about post harvest technology of the turmeric should be given by the appropriate source like Horticulture department and KVK's (22.50%), provision of market facilities (20.94%) and seed material should be available in low price (8.13%).

Table 4.60: Distribution of the respondents according to their suggestions during turmeric cultivation

Sl. No.	Suggestions	F*	%	Rank
1	Seed rhizomes should be available at proper time	58	18.13	VII
2	There should be assured selling price of turmeric	138	43.13	I
3	Training facility about post harvest technology of the turmeric should be given by the appropriate source like horticulture Department and KVKs.	72	22.50	V
4	Fertilizers should be available at standard rates	84	26.25	III
5	Processing unit should be available	86	26.88	II
6	Provision of market facilities	67	20.94	VI
7	Seed material should be available in low price	26	8.13	VIII
8	Storage facilities should be available	81	25.31	IV

*Data are based on multiple responses

CHAPTER – V

SUMMARY AND CONCLUSIONS

Horticulture play an important role in Indian agriculture and ultimately in Indian economy and nutrition. Horticulture plantation constitutes specialized form of farm business and is highly commercial in nature. During last few decades Indian horticulture has changed from traditional to modern.

National Horticulture Mission (NHM) is a programme formulated by Government of India for the overall development of horticulture sectors in the country. The main objective of the programme is to improve the production and productivity of horticultural crops. It is a holistic approach covering all aspects of production post harvest technology sector to the maximum potential available in the States, provide holistic growth of the horticulture sector through regionally differentiated strategies, improve nutritional security and income support to farm household, establish convergence and synergy among multiple on-going and planed programme, promote, develop and disseminate technologies, create opportunities for employment generation for skilled and unskilled persons.

Turmeric is one of the most important spices crops of India and is cultivated from ancient times. The oldest literary record about the use of turmeric in India is found in Atharvanaveda composed in 1400 B.C. Turmeric is cultivated extensively in India, Sri Lanka, China, Pakistan, Bangladesh and Taiwan etc. India leads in turmeric production in the world and occupies an area of 233 thousand hectares and production of 1190 thousand tones (Anonymous, 2015).

Chhattisgarh is also one of the important states of turmeric cultivation. Chhattisgarh State covers about 11.02 thousands hectares of cultivated area with production of 113.34 thousands tones. Therefore, the present study entitled “**A Study on Impact of National Horticulture Mission on Socio-economic Status of Turmeric Growers of Chhattisgarh Plains**” was undertaken during the years 2015-16 and 2016-17 with following objectives:

1. To study the socio-personnel, socio-economic, communicational and socio-psychological profile of turmeric growers
2. To study the knowledge and adoption level of turmeric growers
3. To study the attitude of turmeric growers towards NHM
4. To identify the benefits received by the turmeric growers under NHM
5. To assess the impact of NHM on area, productivity and socio-economic status of turmeric growers
6. To determine the constraints and obtain the suggestions from turmeric growers regarding turmeric cultivation

An *Ex-post-facto* research design was used in the present investigation. The study was conducted in Chhattisgarh plains.

The state comprises 27 districts and the NHM scheme has been implemented in 19 districts, out of which 5 districts were selected purposively on the basis of maximum area and maximum number of turmeric growers. From each selected district, 2 blocks were selected purposively on the basis of maximum area and maximum number of turmeric growers. From each selected block, 4 villages were selected purposively on the basis of maximum area and maximum number of turmeric growers.

A comprehensive list of beneficiaries respondents was collected from the horticulture department. In order to reach required sample size of 160 beneficiaries respondents, proportionate random sampling method was used and equal numbers of non-beneficiaries respondents were also selected randomly from same villages. In this way, a total of 320 farmers were considered as respondents to respond as per the interview schedule design for the study.

The independent variables selected for the study were age, education, caste, family size, family type, social participation, experience in turmeric cultivation, house type, occupation, land holding, soil type, irrigation facilities, farm power, annual income, credit acquisition, material possession, seed source, storage, processing and value addition, extension contact, mass media exposure, scientific orientation, risk orientation, cosmopolitaness, achievement motivation, economic motivation,

awareness of turmeric growers about NHM, attitude of turmeric growers towards NHM, knowledge and adoption level of turmeric growers.

The dependent variables selected for the study were Impact of National Horticulture Mission on socio-economic status of turmeric growers and productivity of turmeric.

Major findings

- ❖ In age, most of the beneficiaries (60.00%) and non-beneficiaries (57.50%) had middle age group.
- ❖ In education, maximum numbers of beneficiaries (26.87%) had educated up to middle school level. A significant percentage (29.38%) of the non-beneficiaries had educated up to primary school level.
- ❖ In caste, most of the beneficiaries (36.88%) are belonged to other backward castes and most of the non-beneficiaries (43.12%) also belonged to other backward castes.
- ❖ In family size, most of the beneficiaries (40.62%) had a large family size, while most of the non-beneficiaries (41.88%) had a medium size of family.
- ❖ In family type, most of the beneficiaries (58.75%) had a joint family type, whereas most of the non-beneficiaries (55.62%) had a nuclear family type.
- ❖ In social participation, majority of the beneficiaries (75.00%) and non-beneficiaries (81.25%) had involved in one organization.
- ❖ In experience in turmeric cultivation, majority of the beneficiaries (41.88%) and non-beneficiaries (39.38%) belonged to medium farming experience.
- ❖ In house type, most of the beneficiaries (38.12%) and non-beneficiaries (51.25%) had mixed type of house.
- ❖ In occupation, majority of the beneficiaries (51.25%) and non-beneficiaries (70.00%) are engaged in agriculture + labour.
- ❖ In land holding, most of the beneficiaries (40.62%) had small size of farmers and non-beneficiaries (47.50%) had semi-medium farmers.
- ❖ In soil type, most of the beneficiaries (54.38%) had occupied *Vertisols* type of land and non-beneficiaries occupied *Inceptisols* type of land.

- ❖ In irrigation facility, most of the beneficiaries (50.63%) were having tube well and non-beneficiaries (48.75%) had no irrigation sources.
- ❖ In farm power, most of the beneficiaries (57.50%) and non-beneficiaries possessed one or two bullock.
- ❖ In annual income, most of the beneficiaries (36.25%) and non-beneficiaries (48.12%) had earned their annual income ranges between ₹ 1,00,000 to 2,00,000.
- ❖ In credit acquisition, a great majority of the beneficiaries (93.12%) and non-beneficiaries had acquired credit facility.
- ❖ In material possession, majority of the beneficiaries (70.00%) and non-beneficiaries (60.00%) had medium level of material possession.
- ❖ In seed sources, cent percent of the beneficiaries seed available from NHM office and non-beneficiaries (86.25%) had own seed.
- ❖ In seed storage, majority of the beneficiaries (81.25%) and non-beneficiaries (89.37%) had seed storage in ventilated rooms.
- ❖ In processing and value addition, cent per cent of the beneficiaries and non-beneficiaries were naturally drying the turmeric in sunlight.
- ❖ In extension contact, most of the beneficiaries (48.12%) and non-beneficiaries (55.00%) were found in medium extension contact.
- ❖ In mass media exposure, it was observed that most of the beneficiaries (45.63%) and non-beneficiaries (50.62%) had medium level of mass media exposure.
- ❖ In scientific orientation, majority of the beneficiaries (69.38%) and non-beneficiaries (76.25%) had medium level of scientific orientation.
- ❖ In risk orientation, majority of the beneficiaries (78.75%) and non-beneficiaries (81.88%) had medium level of scientific orientation.
- ❖ In cosmopolitaness, more than half of the beneficiaries (52.50%) and non-beneficiaries (51.88%) had medium cosmopolitaness.
- ❖ In achievement motivation, majority of the beneficiaries (63.12%) and non-beneficiaries (64.37%) had medium level of achievement motivation.

- ❖ In economic motivation, most of the beneficiaries (75.62%) and non-beneficiaries (74.37%) had medium level of economic motivation.
- ❖ In awareness about NHM, majority of the beneficiaries (73.12%) and non-beneficiaries (70.00%) had medium level of awareness.
- ❖ In attitude towards NHM, majority of the beneficiaries (86.25%) and non-beneficiaries (62.50%) had favourable attitude towards NHM.
- ❖ In knowledge level regarding turmeric cultivation, majority of the beneficiaries (73.12%) and non-beneficiaries (75.62%) had medium level of knowledge.
- ❖ In adoption level of turmeric cultivation, majority of beneficiaries (62.50%) and non-beneficiaries (64.38%) had medium level of adoption.
- ❖ In area under turmeric cultivation, majority of the beneficiaries (61.25%) and non-beneficiaries (83.75%) had medium size of area.
- ❖ In productivity of turmeric, most of the beneficiaries (68.12%) and non-beneficiaries (55.00%) had medium level of productivity.
- ❖ In socio-economic status, most of the beneficiaries (56.88%) belonged to middle class, while most of the non-beneficiaries (50.62%) belonged to lower middle class.
- ❖ In case of beneficiaries, education ($r=0.567$), social participation ($r=0.220$), house type ($r=0.706$), land holding ($r=0.471$), farm power ($r=0.292$), annual income ($r=0.509$), credit acquisition ($r=0.225$), material possession ($r=0.510$), cosmopolitaness ($r=0.441$) and knowledge level had positive and highly significant correlation with socio-economic status of the respondents. While, occupation ($r=0.191$), irrigation ($r=0.198$), extension contact ($r=0.162$), scientific orientation ($r=0.202$), risk orientation ($r=0.162$) and adoption level had positive and significant correlation with socio-economic status of the respondents. The other variables such as caste ($r=0.109$), family size ($r=0.087$), family type ($r=0.112$), experience ($r=0.064$), soil type ($r=0.054$), seed source ($r=0.135$), mass media exposure ($r=0.069$), achievement motivation ($r=0.092$), economic motivation ($r=0.142$) awareness ($r=0.104$)

and attitude ($r=0.089$) had positive but non-significant correlation with socio-economic status of the respondents. Age ($r=-0.011$), storage ($r=-0.128$) and processing and value addition ($r=-0.092$) had negative and non-significant correlation with socio-economic status of the respondents. Whereas, in case of non-beneficiaries, education ($r=0.366$), social participation ($r=0.306$), house type ($r=0.645$), occupation ($r=0.278$), land holding ($r=0.618$), annual income ($r=0.711$), credit acquisition ($r=0.359$), farm power ($r=0.538$), material possession ($r=0.442$), cosmopolitaness ($r=0.258$) and knowledge level ($r=0.298$) had positive and highly significant relationship with socio-economic status of the respondents and the variables soil type ($r=0.204$), mass media exposure ($r=0.182$), risk orientation ($r=0.205$) and adoption level ($r=0.169$) had positive and significant relationship with socio-economic status of the respondents. The other variables like caste ($r=0.145$), family size ($r=0.092$), family type ($r=0.119$), irrigation ($r=0.063$), seed source ($r=0.103$), processing and value addition ($r=0.156$), extension contact ($r=0.125$), scientific orientation ($r=0.126$), achievement motivation ($r=0.110$), economic motivation ($r=0.139$), awareness ($r=0.148$) and attitude ($r=0.118$) had positive but non-significant relationship with socio-economic status of the respondents. Age ($r=-0.084$), experience ($r=-0.017$) and processing and value addition ($r=-0.102$) had negative and non-significant correlation with socio-economic status of the respondents.

- ❖ In case of beneficiaries, education ($r=0.223$), land holding ($r=0.221$), soil type ($r=0.250$), irrigation ($r=0.232$), annual income ($r=0.241$), mass media exposure ($r=0.212$), risk orientation ($r=0.239$), knowledge level ($r=0.265$) and adoption level ($r=0.227$) had positive and highly significant relationship with productivity and the variables farm power ($r=0.172$), extension contact ($r=0.163$) and scientific orientation ($r=0.168$) had positive and significant relationship with productivity at 0.05 per cent level of probability. The other variables such as age ($r=0.074$), social participation ($r=0.109$), experience ($r=0.004$), house type ($r=0.148$), credit acquisition ($r=0.057$), material

possession ($r=0.157$), seed source ($r=0.075$), storage ($r=0.028$), processing and value addition ($r=0.003$), cosmopolitanness ($r=0.115$), achievement motivation ($r=0.054$), economic motivation ($r=0.093$), awareness ($r=0.155$) and attitude ($r=0.037$) had positive and non-significant relationship with productivity. Caste ($r=-0.028$), family size ($r=-0.050$), family type ($r=-0.050$) and occupation ($r=-0.113$) had negative but non-significant correlation with productivity. While, in case of non-beneficiaries, land holding ($r=0.228$), irrigation ($r=0.271$), credit acquisition ($r=0.261$), scientific orientation ($r=0.215$), risk orientation ($r=0.245$), knowledge level ($r=0.225$) and adoption level ($r=0.208$) had positive and highly significant relationship with productivity and the variables, education ($r=0.172$), social participation ($r=0.194$), soil type ($r=0.203$) and material possession ($r=0.186$) had positive and significant relationship with productivity. The other variables like caste ($r=0.078$), experience ($r=0.093$), house type ($r=0.071$), farm power ($r=0.053$), annual income ($r=0.054$), seed source ($r=0.039$), storage ($r=0.130$), processing and value addition ($r=0.035$), extension contact ($r=0.038$), mass media exposure ($r=0.052$), cosmopolitanness ($r=0.145$), achievement motivation ($r=0.100$), economic motivation ($r=0.048$), awareness ($r=0.043$) and attitude ($r=0.006$) had positive and non-significant relationship with productivity. Age ($r=-0.044$), family size ($r=-0.012$), family type ($r=-0.060$) and occupation ($r=-0.112$) had negative but non-significant correlation with productivity.

- ❖ Multiple regression analysis was carried out for determining the contributions of independent variables with impact of socio-economic status of the beneficiaries. The study revealed that the variables viz., education, caste, social participation, occupation, house type, farm power, annual income, material possession, and economic motivation contributed highly significantly at 0.01 level of probability and family size, annual income, and mass media contributed significant at 0.05 level of probability towards socio-economic status of the respondents. Remaining variables could not influence the socio-economic status of the respondents. While in case of non-beneficiaries, the

variables viz., education, caste, house type, occupation, farm power, material possession and mass media exposure contributed highly significant at 0.01 level of probability and family size, social participation and annual income contributed significant at 0.05 level of probability towards socio-economic status of the respondents. Remaining variables could not influence the socio-economic status of the respondents.

- ❖ The constraints faced by the respondents regarding unavailability of processing unit (53.75%) was the major problem, which occupied first rank, followed by high cost of manure and fertilizers (34.06%) as second rank and high cost of seed rhizomes was the minor problem which occupied 12th rank by the respondents.
- ❖ The suggestions given by the respondents to overcome the constraints were related to assured selling price of turmeric (43.13%) which was the major suggestion and occupied first rank, followed by processing unit should be available (26.88%) and seed material should be available in low price (8.13%) was the minor suggestions which occupied 8th rank.

Conclusions

Majority of the beneficiaries respondents were middle aged, with middle school education, belonged to other backward class, large family size, joint family, involved in one organization of social participation, medium farming experience, mixed type house, engaged in labour, small farmer, occupied *Vertisols* type of land, having tube well, possessed one or two bullock, annual income (₹ 1,00,001 to 2,00,000), credit acquired from co-operative society, medium level of material possession, seed available from NHM office, seed storage in ventilated room, naturally dry from sunlight, medium level of extension contact, medium level of mass media exposure, medium level of scientific orientation, medium level of risk orientation, medium cosmopolitaness, medium level of achievement motivation, medium level of economic motivation, medium level of awareness, favourable attitude towards NHM, medium level of knowledge level and medium level of

adoption level, medium size of area, medium level of productivity, belonged to middle class.

Independent variables like education, social participation, house type, land holding, farm power, annual income, credit acquisition, material possession, cosmopolitaness and knowledge level had positive and highly significant association with socio-economic status of the beneficiaries respondents, while, occupation, irrigation, extension contact, scientific orientation, risk orientation and adoption had positive and significant association with socio-economic status of the beneficiaries respondents, which means that an increase in variable value results in an increase in the impact of socio-economic status of the beneficiaries respondents, while variables viz., caste, family size, family type, experience, soil type, seed source, mass media exposure, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with impact of socio-economic status of the beneficiaries respondents. Variables like age, storage and processing and value addition had a negative and non-significant correlation with impact of socio-economic status of the beneficiaries' respondents.

Independent variables viz., education, land holding, soil type, irrigation, annual income, mass media exposure, risk orientation, knowledge level and adoption level had a positive and highly significant correlation with productivity of turmeric, while variables farm power, extension contact and scientific orientation had a positive and significant correlation with productivity of turmeric, which means that an increase in variable value results in an increase the productivity of turmeric, while variables like age, social participation, experience, house type, credit acquisition, material possession, seed source, storage, processing and value addition, cosmopolitaness, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with productivity of turmeric. Variables

like caste, family size, family type and occupation had a negative and non-significant correlation with productivity of turmeric.

The results of regression analysis shows that out of 30 variables education, caste, social participation, occupation, house type, farm power, annual income, material possession, and economic motivation contributed highly significantly at 0.01 level of probability and family size, annual income, and mass media contributed significant at 0.05 level of probability towards socio-economic status of the respondents. Remaining variables could not influence the socio-economic status of the respondents.

In case of non-beneficiaries respondents, majority of the respondents were middle age group, educated up to primary school, belonged to other backward castes, with medium family size, having nuclear family, involved in one organization of social participation, medium farming experience, mixed type house, engaged in labour, semi-medium farmers, occupied *Inceptisols* type of land, no irrigation sources, possessed one or two bullock, annual income (₹ 1,00,000 to 2,00,000), credit acquired from co-operative society, medium level of material possession, used own seed, seed storages in ventilated room, naturally dry from sunlight, medium level of extension contact, medium level of mass media exposure, medium level of risk orientation, medium cosmopolitaness, medium level of achievement motivation, medium level of economic motivation, medium level of awareness, favourable attitude towards NHM, medium level of knowledge, medium level of adoption, medium size of area, low level of productivity and lower middle class.

Independent variables viz., education, social participation, house type, occupation, land holding, annual income, credit acquisition, farm power, material possession, cosmopolitaness and knowledge level had a positive and highly significant correlation with impact of socio-economic status of the beneficiaries respondents, while the variables soil type, mass media exposure, risk orientation and adoption level had a positive and significant correlation

with impact of socio-economic status of the non-beneficiaries respondents, which means that an increase in variable value results in an increase the impact of socio-economic status of the non-beneficiaries respondents, while variables caste, family size, family type, irrigation, seed source, processing and value addition, extension contact, scientific orientation, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with impact of socio-economic status of the beneficiaries respondents. Variables like age, experience and storage had a negative and non-significant correlation with impact of socio-economic status of the non-beneficiaries respondents.

Independent variables viz., land holding, irrigation, credit acquisition, scientific orientation, risk orientation, knowledge level and adoption level had positive and highly significant correlation with productivity of turmeric, while, education, social participation, soil type and material possession had positive and significant correlation with productivity of turmeric, which means that an increase in variable value results in an increase the productivity of turmeric, while variables like caste, experience, house type, farm power, annual income, seed source, storage, processing and value addition, extension contact, mass media exposure, cosmopolitaness, achievement motivation, economic motivation, awareness and attitude had a positive and non-significant correlation with productivity of turmeric. Variables such as age, family size, family type and occupation had a negative and non-significant correlation with productivity of turmeric.

The results of regression analysis shows that out of 30 variables education, caste, house type, occupation, farm power, material possession and mass media exposure contributed highly significant at 0.01 level of probability and family size, social participation and annual income contributed significant at 0.05 level of probability towards socio-economic status of the respondents. Remaining variables could not influence the socio-economic status of the respondents.

The major constraints faced by the respondents of unavailability of processing unit was first rank, followed by high cost of manure and fertilizers was second rank and high cost of seed rhizomes was 12th rank.

The suggestion offered by the respondents of assured selling prices of turmeric was first rank, followed by processing unit should be available was second rank and seed material should be available in low price was 8th rank.

Recommendations

- Quantity of inputs should be increased.
- Marketing hub should be created for the marketing of horticultural crops.
- Input material should be of high quality.
- Farmers committee should be constituted at block level for National Horticulture Mission.
- Farmers may be motivated for production of horticultural crops.
- More demonstration and training camp should be organized for creating farmers interest.
- Paper work should be minimized for getting services under National Horticulture Mission.

Suggestions for future research work

- The present study was conducted only in five districts of Chhattisgarh state, similar studies can be conducted in other districts.
- The impact study can be conducted on other crops like fruits, vegetables and flowers under National Horticulture Mission scheme.
- The area of research should be extended to large number of farmers to draw valid conclusion.
- Such study should be repeated after some laps of time on large sample size to increase its validity.

REFERENCES

- Aglawe, D.D., Lairenlakpam, M. and Kokate, D.S. 2014. Constraints faced by farmers in adoption of turmeric production technology. *Guj. J. Ext. Edu.*, 25(2):215-217.
- Anantkawlas, M. B. 2014. A study of turmeric processing and its export from India. *Research front*,2(3): 51-56.
- Andhari, V., Sonawane, H. and Khalache, P.G. 2010. Marketing behaviour of tomato growers in western Maharashtra. *Agriculture Update*,5(3&4): 287-291.
- Anonymous, 2014. Department of Horticulture, Raipur, C.G.
- Anonymous, 2015. Horticulture Statistics Division, Department of Agriculture, Cooperation & Farmer Welfare, Ministry of Agriculture & Farmer Welfare, Government of India, New Delhi.
- Anonymous. 2010. *Indian Horticulture*. November-December 2010. Vol. 55 No.6.
- Anonymous. 2013. *Indian Horticulture Database*. National Horticulture Board, Ministry of Agriculture, Government of India, New Delhi.
- Babu, N., Shukla, A.K., Tripathi, P.C. and Prusty, M. 2015. Traditional cultivation practices of turmeric in tribal belt of Odisha. *Journal of Engineering Computers & Applied Sciences*, 4(2): 52-57.
- Badhe, D.K. and Saiyad, A. S. 2011. A study on knowledge level of recommended production technology among brinjal growers of Anand district of Gujarat. *Agriculture Update*,6(3&4):116-117.
- Badodiya, S.K., Kushwah, R.S., Garg, S.K. and Shakya, S.K. 2011. Impact of Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) on poverty alleviation. *Raj. J. Extn. Edu.*, 19: 206-209.

- Badodiya, S.K., Tomar, S., Patel, M.M. and Daipuria, O.P. 2012. Impact of Swarnajayanti Gram Swarozgar Yojana on poverty alleviation. *Indian Res. J. Ext. Edu.*, 12(3): 37-40.
- Bheemudada, A.B. and Natikar, K.V. 2016. A study on knowledge level of farmers about the ginger cultivation practices and constraints in adoption of improved practices. *J. Farm Sci.*, 29(1): 133-134.
- Bolarinwa, K.K. and Fakoya, E.O. 2011. Impact of farm credit on farmers socio-economic status in Ogun State, Nigeria. *J. Soc. Sci.*, 26(1): 67-71.
- Boruah, R., Borua, S., Deka, C.R. and Borah, D. 2015. Entrepreneurial behavior of tribal winter vegetable growers in Jorhat district of Assam. *Indian Res. J. Ext. Edu.*, 15(1): 65-69.
- Chavai, A.M. and Kadam, P.M. 2016. Impact of National Horticulture Mission on the pomegranate growers of Maharashtra. *International Journal of Tropical Agriculture*, 34(4): 1083-1086.
- Chavai, A.M., Yamgar, A.S. and Barange, P.K. 2015. Adoption behavior of turmeric growers about Post Harvest Technology. *International Journal of Tropical Agriculture*, 33(4): 3533-3536.
- Chinchmalatpure, U.R. 2016. Factors responsible for socio-techno-economic changes in Sardar Sarovar Project affected farmers. *Advance Research Journal of Social Science*, (7)1: 1-6.
- Cochran and Cox, 1957. *Experimental Design*. Second edition, 1957.
- Daivadeenam, P. and Somani, L.L. 2013. *Research Methodology in Extension Education*, 2nd edition. Agrotech publishing academy, Udaipur, pp 132-135.
- Das, M. and Puzari, N.N. 2010. Impact of training skill and knowledge development of rural women. *Advance Research Journal of Social Science*, 1(2): 185-187.

- Deshmukh, R.C., Surwenshi, A., Gayatri, B. and Balaji, J. 2011. Socio-demographic and economic profile of NAIP beneficiaries. *International Research Journal of Agricultural Economics and Statistics*, 2(2): 228-231.
- Dessalegn, Y., Assefab, H., Dersoc, T. and Teferad, M. 2014. Mango production, knowledge and technological gaps of smallholder farmers in Amhara Region, Ethiopia. *American Scientific Research Journal for Engineering, Technology and Sciences*, 10(1): 28-39.
- Devaki, K., Senthilkumar, K. and Subramanian, R. 2015. Socio-economic profile of livestock farm women of Thiruvallur district, Tamil Nadu. *International Journal of Science, Environment and Technology*, 4(5): 1322 – 1329.
- Dhalpe, N.D. and Dawane, V.T. 2016. Study of socio-economic profile of scientists, teachers and extension workers in State Agriculture Universities. *Advance Research Journal of Social Science*, 7(2): 189-191.
- Dhruw, Y.S. 2014. Constraints analysis in adoption of summer rice production technology in Dhamtari district of Chhattisgarh. M. Sc. (Ag.) Thesis, *Indira Gandhi Krishi Vishwavidyalaya, Raipur*.
- Dubey, A.K., Srivastva, J.P., Singh, R.P. and Sharma, V.K. 2008. Impact of KVK training programme on socio-economic status and knowledge of trainees in Allahabad District. *Indian Res. J. Ext. Edu.*, 8(2&3): 60-60.
- Fartyal, S. and Rathore, S. 2014. Gender differences in decision making pattern of hill vegetables growers. *Indian Res. J. Ext. Edu.*, 14 (2): 123-126.
- Gaikwad, A.B., Shinde, S.B. and Kolgane, B.T. 2011. Knowledge of extension personnel about horticultural recommendations on selected fruit crops. *Agriculture Update*, 6(3&4): 155-160.

- Gamanagatti, P.B. and Dodamani, M.T. 2016. Socio-economic conditions of Bt cotton growers across different farm size holders in northern transitional zone of Karnataka. *International Research Journal of Agricultural Economics and Statistics*, 7(2): 223-227.
- Garg, S., Kaur, P. and Dhaliwal, R.K. 2013. Satisfaction of fruit growers regarding the services availed under National Horticulture Mission. *The Asian Journal of Horticulture*, 8(2): 737-742.
- Girawale, V.B., Naik, R.M. and Patil, R.M. 2016. Personal, socio-economic and communicational characteristics of root & tuber crop growers. *Guj. J. Ext. Edu.*, 27(2):169-171.
- Gondkar, S., Singh, B.K. and Kumbhare, N.V. 2012. Entrepreneurial characteristics of protected cultivation entrepreneurs in Pune district (Maharashtra). *Indian Journal of Extension Education*, 48(1&2):91-94.
- Grandhi, M., Rao, I.S. and Rani, V.S. 2016. A comprehensive study on credit orientation behaviour of SHG women. *Ind. J. Ext. Educ. & R.D.*, 24:10-12.
- Gulkari, K.D. 2011. Attitude of beneficiaries towards National Horticulture Mission. M.Sc (Ag.) Thesis, B. A. College of Agriculture Anand Agricultural University, Anand.
- Gupta, B.K., De, D. and Raha, P. 2010. Extent of knowledge of vegetable growers about the side effects of pesticides. *Indian Journal of Extension Education*, 46(3&4):38-42.
- Gupta, T. and Dey, M. 2014. Socio-economic and cultural profile of fish farmers: a study in and around Lumding town, Nagaon district of Assam. *International Journal of Life Science Biotechnology and Pharma Research*, 3(4): 83-93.
- Guru, R., Shilpa, S. and Maheshwaran, R. 2015. Revised socio-economic status scale for urban and rural India-revision for 2015. *The Scientific Journal*

- for Theory and Practical of Socio-economic Development, 4(7): 167-174.
- Hadole, S.M. 2005. Socio-economic status of the farmers adopting different farming system in Ratnagiri district. Ph. D. (Agri.) Thesis, Dr. Balasaheb Aawant Konkan Krishi Vidya Peeth, Dapoli.
- Jaganathan, D., Padmanabhan, V.B., Bhaskaran, C., Chandru, A. and Lenin, V. 2009. Attitude of vegetable growers towards organic farming practices. *Indian Journal of Extension Education*, 45(3&4):63-67.
- Jana, H., Basu, D. and Kole, R. K. 2016. Okra growers pesticides use pattern in controlling insect-pests and diseases in north Paraganas district of West Bengal. *International Journal of Current Advanced Research*, 5(8): 1154-1163.
- Jha, K.K. 2012. Entrepreneurial behaviour of pineapple growers. *Indian Research Journal of Extension Education*, 1: 142-145.
- Jobpaul, K.D.L. and Rao, D.S. 2011. Impact of watershed development on equitable distribution of income and employment : A study in drought prone district of Kadapa in Andhra Pradesh. *International Research Journal of Agricultural Economics and Statistics*, 2(2): 262-268.
- Kadam, M.M., Ganvir, B.N. and Lamtule, J.A. 2013. Impact of watershed project on farmers' economy in Nagpur district. *International Research Journal of Agricultural Economics and Statistics*, 4(2): 176-179.
- Kamble, K.J. and Soni, S.B. 2009. A study of improving turmeric processing. *Karnataka J. Agric. Sci.*, 22(1): 137-139.
- Karpagam, C. 2006. Critical analysis of adoption behavior of turmeric cultivators in Tamil Nadu State. *Internat. J. agric. Sci.*, 2(2):526-528.
- Kashyap, V. 2015. Role of socio-economic status in the assessment of occupational stress. *Journal of Research: The Bede Athenaeum*, 6(1): 68-76.

- Khalache, P.G., Tale, N.N. and Tayade, R.V. 2012. Study of knowledge level and relationship between socio-economic profile and situational attributes of the cotton growers. *Advance Research Journal of Social Science*, 3(1): 22-25.
- Kiruthika, N. 2013. The economics of production of turmeric in India: a case study of Erode district of Tamil Nadu. *Journal of Innovative Research and Solutions*, 1(1): 123-30.
- Kumar, M., Saini, S.K. and Dhillon, D.S. 2010. Adoption of recommended PAU practices for *Capsicum* cultivation. *Agriculture Update*, 5(1&2): 22-28.
- Kumar, S. and Sharma, G. 2009. Entrepreneurial behaviour of vegetable growers. *Indian Journal of Extension Education*, 45(3&4): 125-127.
- Kumari, A.R. and Laxmikant. 2015. Impact of bee keeping training on socio-economic status of rural women. *Advance Research Journal of Social Science*, 6(1): 51-55.
- Landge, V.V., Pawar, B.R., Yeware, P.P. and Deshmukh, D.S. 2010. Constraints and suggestions of banana growers in drip and flood irrigated systems. *Agriculture Update*, 5(1&2): 155-157.
- Latha, M. 2015. Impact of National Horticulture Mission in North and Middle Andaman district of Andaman and Nicobar Islands. M. Sc. (Ag.) Thesis, Professor Jayashankar Telangana State Agricultural University, Hyderabad.
- Marbaniang, E.K., Manjunath, L., Yadav, V.S., Sadaqath, S. and Natikar, K.V. 2011. Association between socio-economic profile characteristics of Tibetan rehabilitants and their problems. *Advance Research Journal of Social Science*, 2(1): 96-100.
- Meena, R.K., Chauhan, M.S. and Upadhyay, B. 2010. Knowledge of improved cultivation practices of rose grown by the farmers of

- KhamnorPanchayatSamitidistrict of Rajsamand, Rajasthan. Indian Journal of Extension Education, 46(3&4):132-134.
- Modi, R.D., Bheemappa, A., Manjunath, L. Hegde, R.V. and Havaladar, Y.N. 2013. Entrepreneurial characteristics of mango growers and their constraints in adoption of post-harvest management practices in mango. Karnataka J. Agric. Sci., 26(3): 384-387.
- Modi, R.D., Bheemappa, A., Manjunath, L., Hegde, R.V. and Handigol, J.A. 2010. Determinants of knowledge and adoption of post-harvest management practices among mango growers of Northern Karnataka. Karnataka J. Agric. Sci., 23(4): 606-611.
- Mohanraj, K. and Karthikeyan, C. 2012. Socio-economic impact of Mahatma Gandhi National Employment Guarantee Scheme (MGNREGS) on beneficiaries: A case study in Coimbatore district of Tamil Nadu. International J. of Exten. Edu., 8 : 77-82.
- Mohapatra, A.S. and Sahu, U.N. 2012. A study of socio-economic and entrepreneurial characteristics of tribals of Mayurbhanj district in sabai grass enterprise. International Journal of Management, IT and Engineering, 2(5): 426-437.
- Mugadur, N.S. and Hiremath, R.C. 2014. Socio-economic condition of agriculture women labour: a case study. Indian Journal of Research, 3(12): 50-52.
- Murlidhar, K.N. 2008. Socio-economic, psychological and situational causes of suicides of farmers in Vidarbha region. Ph. D. (Agri.) Thesis, Dr. PanjabraoDekhmukhKrishiVidyapeeth, Akola.
- Mustafa, M., Pandey, S.K. and Katore, S. 2011. Socio-economic profile constraints faced by aonla growers in Ratlam district of Madhya Pradesh. Agriculture Update, 6(1): 151-153.
- Nagesh, B., Halakatti, S.V. and Hanchinal, S.N. 2011. Study on entrepreneurial behaviour of pomegranate growers. Agriculture Update, 6(3&4): 122-125.

- Nand, A., Saha, K. and Mondal, D. 2012. Socio-economic status of the self-help groups under West Bengal Comprehensive Area Development Corporation. *Agriculture Update*, 7(1&2):1-4.
- Narbaria, S. 2013. A study on adoption level of system of rice intensification (SRI) technology among farmers in Dhamtari district of Chhattisgarh. M. Sc. (Ag.) Thesis, Indira Gandhi KrishiVishwavidyalaya, Raipur.
- Nirban, A.J. 2004. Analysis of the agricultural produce market committees in Konkan and Western Maharashtra with reference to their potential role in agricultural marketing extension. Ph. D. (Agri.) Thesis, Mahatma Phule Krishi Vidyapeeth, Rahuri.
- Ovhar, N.D. and Dhenge, S.A. 2014. Constraints faced by turmeric growers about improved cultivation practices. *Trends in Biosciences*, 7(19): 2999-3000.
- Ovhar, N.D. and Wakle, P.K. 2013. Adoption of improved cultivation practices of turmeric by farmers. *Periodic Research*, II (I): 64-67.
- Pagaria, P. 2014. Knowledge and attitude of farmers towards vermicompost technology. *J. Krishi Vigyan*, 3(1): 42-44.
- Pallavi, S. 2016. A study on the impact of Better Cotton Initiative (BCI) Programme on cotton growers in Karimnagar district of Telangana State. M. Sc. (Ag.) Thesis, Professor Jayashankar Telangana State Agricultural University.
- Parganiha, O.P. 2016. Farmer's perception about climate change and its impact on agriculture and allied activities in Chhattisgarh plains. Ph. D. (Ag.) Thesis, Indira Gandhi Krishi Vishwavidyalaya, Raipur.
- Patel, D.B., Mistry, J.J. and Patel, V.M. 2016. Impact of cumin crop field demonstrations on knowledge of farmers. *Guj. J. Ext. Edu.*, 27(1):45-48.

- Patel, V.V., Sasidhar, P.V.K. and Thakkar, K.A. 2015. Impact of different activities of KVK, Kutch among the date palm growers. *Advance Research Journal of Social Science*, 6(2): 141-148.
- Patil, M., Bheemappa, A., Angadi, J.G. and Hawaldar, Y.N. 2010. Entrepreneurial characteristics of organic vegetable growers. *Karnataka J. Agric. Sci.*, 23(3): 530-532.
- Patil, R.K., Rajakumar and Dhanraj 2014. Study of personal, socio-economic and psychological profile of khol crop growers of Belgaum district. *International Journal of Agricultural Sciences*, 10(2): 730-734.
- Poonia, M.K. and Dhaka, B.L. 2011. Training need assessment of vegetable farmers in Bundi district of Rajasthan. *Indian Journal of Extension Education*, 47(1&2): 80-85.
- Pradhan, S.K. 2017. Study on adoption of agricultural technology in Plateaux (Pat areas) of Northern hills agro-climatic zone of Chhattisgarh. Ph. D. (Ag.) Thesis, Indira Gandhi Krishi Vishwavidyalaya, Raipur.
- Prakalpa, S. and Mishra, P. 2014. Socio-economic profile of women and their knowledge about development programmes. *Asian Science*, 9(1&2): 29-32.
- Rai, D.P. and Singh, K. 2008. Awareness, attitude and training needs of farmers about recommended cumin production technology. *Agriculture Update*, 5(1 & 2): 194-196.
- Rai, D.P., Singh, S.K. and Pandey, S.K. 2012. An analytical study on impact of National Horticulture Mission (NHM) among the beneficiaries in Chhatarpur district (M.P.). *Asian Science*, 7(1): 73-77.
- Reza, M.S. and Arshad, M. 2012. A study on socio-economic benefits derived by poor rural producers from bamboo value chain up-gradation in Tripura north-east India. *Advance Research Journal of Social Science*, 3(1): 72-76.

- Rogers, E.M. 1983. Diffusion of Innovation.3th edition. The Free Press, New York.
- Rogers, E.M. 1995. Diffusion of Innovation.4th edition. The Free Press, New York.
- Roy, M.L., Chandra, N., Kharbikar, H.L., Joshi, P. and Jethi, R. 2013. Socio-economic status of hill farmers: an exploration from Almora district in Uttarakhand. *International Journal of Agriculture and Food Science Technology*, 4(4): 353-358.
- Salunkhe, S.R., Pandya, R.D. and Rai, S.K. 2012. A study on personal, socio-economic, psychological and situational characteristics of agro-service providers and beneficiaries in Gujarat state. *Agriculture Update*, 7(3&4): 389-393.
- Sanjeev, M.V. and Saroj, P.L. 2014. Technology utilization and its socio-economic determinants among cashew farmers of Karnataka. *Indian Res. J. Ext. Edu.*, 14(3): 59-64.
- Santosh, N.A. and Bheemappa, A. 2016. Entrepreneurial characteristics among the beneficiaries of National Horticulture Mission in Dharwad district. *J. Farm Sci.*, 29(2): 278-279.
- Sasane, G.K., Jagdale, U.D. and Khule, R.P. 2010. Knowledge and adoption of brinjal management practices by the farmers. *Agriculture Update*, 5(3&4):495-497.
- Savita, Natikar, K.V. and Halakatti, S.V. 2011. Impact of community based tank management project on socio-economic status of beneficiary farmers. *Advance Research Journal of Social Science*, 2(1): 101-105.
- Sawant, M.S., Hadole, S.M. and Gedam, V.B. 2013. Constraints of turmeric growers in adoption of recommended practices of turmeric cultivation. *Agriculture Update*, 8(4): 626-628.

- Sawant, P.A. 1999. An experiment study of the effectiveness of different modes of presentation of information on mushroom cultivation through television. Ph. D. (Ag.) Thesis, University of Agricultural Science, Dharwad.
- Seemaprakalpa and Mishra, S. 2014. Socio-economic profile of women in panchayat. Asian Journal, 9(1&2): 37-40.
- Seemaprakalpa. 2016. Socio-economic and family background of entrepreneurs in Agra rural. Advance Research Journal of Social Science, 7(2): 230-238.
- Shankar, R.K. 2005. Agricultural weather forecasting, impact and analysis in Andhra Pradesh. M. Sc. (Ag.) Thesis, Acharya NG Ranga Agricultural University, Hyderabad.
- Sharma, P., Patel, M.M. and Singh, V.B. 2011. Entrepreneurial orientation of garlic producers. Indian Journal of Extension Education, 47(1&2): 107-112.
- Sharma, P.K., Choudhary, M.K., Shekhawat, B.S. and Prajapati, K.A. 2016. Socio-economic status and constraints faced by tomato growers in Kheda District. J.KrishiVigyan, 5(1): 114-116.
- Shriwas, Y., Sarkar, J.D., Awsthi, H.K. and Sarthi, N. 2015. Knowledge of recommended brinjal production technology among the farmers. Plant Archives, 15(2): 809-812.
- Shukla, B. and Gupta, J.K. 2016. Socio-economic impact of zero-till wheat in Pratapgarh, district of U.P. International Research Journal of Agricultural Economics and Statistics, 7(2): 164-168.
- Shukla, R. and Sharma, O.P. 2010. Socio-economic status of mulberry sericulturists of Udaipur, Rajasthan. Advance Research Journal of Social Science, 1(2): 107-109.
- Singh, D.K., Singh, A.K., Yadav, V.P., Singh, R.B., Baghel, R.S. and Singh, M. 2009. Association of socio-economic status with economic motivation of the farmers. Indian Res. J. Ext. Edu., 9(2): 53-56.

- Singh, K., Shekhawat, S.S. and Ghintala, A. 2016. Attitude of beneficiary farmers towards National Horticultural Mission. *Ind. J. Ext. Educ. & R.D.*, 24:142-145.
- Singh, M. 2014. Socio-economic status of chilli growers of Abhanpur Block of Raipur district. *Trends in Biosciences*, 7(20): 3242-3246.
- Singh, R.K., Verma, S., Mittoliya, V. and Tyagi, S.K. 2015. Impact of KVK training programme on socio-economic status and knowledge of farmers in Khargonedistrict of Madhya Pradesh. *Journal of Community Mobilization and Sustainable Development*, 10(1): 43-45.
- Singh, S.P. and Verma, S.K. 2014. To study the impact of KVK's on socio-economic status, knowledge level and adoption behaviour of the respondents. *Prog. Agric.*, 14(2): 285-289.
- Smitha, S., Sreeram, V., Onima, V.T. and Gulkari, K. 2017. Measurement of farmers' attitude towards greenhouse technology in Anand district of Gujarat. *International Journal of Farm Sciences*, 7(1): 77-81.
- Sonawane, H.P. and Neware, S.S. 2016. Extent of awareness of plant protection measures among vegetable and fruit growers. *Guj. J. Ext. Edu.*, 27(1): 91-95.
- Soni, A. N., Pandya, C.D. and Patel, G.R. 2016. Impact of Self Help Groups on socio-economic status of tribal women in adopted villages of KVK, Tapi, Gujarat, India. *International Journal of Agriculture Sciences*, 8(20): 1357-1361.
- Sunil, N.K. and Manjula, N. 2010. Socio-economic, psychological and extension attributes of trained and untrained farmers of KVK Bijapur. *Agriculture Update*, 5(1&2): 38-42.
- Supe, S.V. 2007. *Measurement techniques in social sciences*. Agrotech Publishing Academy, Udaipur.

- Tavethiya, B.H. 2010. A study on constraints faced by the cumin growers in adoption of recommended cumin production technology. *Agriculture Update*, 5(1&2): 194-196.
- Thombre, B.M., Atar, R.S. and Suradkar, D.D. 2013. Knowledge of recommended grape cultivation practices by the grape growers. *Agriculture Update*, 8(1&2): 115-118.
- Veer, M.D., Mokhale, S.U., Deshmukh, A.N. and Lanjewar, R.R. 2011. Study on use of MARKNET facility by vegetable growers. *Agriculture Update*, 6(3&4): 94-96.
- Venkataramalu, M., Hanchinal, S.N. and Hirevenkangoudar, L.V. 2004. Knowledge of farmers in chilli production technologies in Guntur district of Andhra Pradesh. *Karnataka J. Agric. Sci.*, 17(4):747-751.
- Venkatesan, P. and Vijayalakshmi, P. 2015. Training needs of farm women towards entrepreneurial development. *Journal of Extension Education*, 27(1): 5416-5421.
- Verma, A.K., Lal, N., Avhad, S.R. and Hari, R. 2014. Socio-economic status of farmers rearing Kherigarh, an indigenous breed of cattle. *The Asian Journal of Animal Science*, 9(2): 134–137.
- Vishnugouda, Sharma, J.P. and Singh, P. 2011. Technological gap in pomegranate cultivation. *Indian Journal of Extension Education*, 47(3&4):26-32.
- Waghmare, V.V. and Kadam, R.P. 2011. Socio-economic change among beneficiary women of self-help group. *Agriculture Update*, 6(1): 17-20.
- Waghmode, T.S., Ahire, M.C. and Ban, S.H. 2013. Socio-economic status of pomegranate growers under National Horticulture Mission (NHM) in Solapur district and constraints faced by them. *Indian Journal of Extension Education*, 49(3&4): 136-139.

- Yadav, J.M., Naik, V.G., Talathi, J.M. and Hake, A.D. 2012. Economics of mango production under GAP certification. *International Research Journal of Agricultural Economics and Statistics*, 3(1): 148-152.
- Yadav, K.N. 2014. Study on managerial efficiency of sericulturists regarding tasar silk cultivation in Chhattisgarh. Ph. D. (Ag.) Thesis, Indira Gandhi Krishi Vishwavidyalaya, Raipur.

Appendix-A

कृषि विस्तार विभाग
कृषि महाविद्यालय, इ.गां.कृ.वि., रायपुर (छ.ग.)

“छत्तीसगढ़ के मैदानी क्षेत्रों के हल्दी उत्पादक कृषकों की सामाजिक-आर्थिक स्थिति पर
राष्ट्रीय बागवानी मिशन के प्रभाव पर एक अध्ययन”

साक्षात्कार अनुसूची

मार्गदर्शक
डॉ. एच. के. अवरथी
(प्रोफेसर)

शोधकर्ता
युवराज सिंह ध्रुव
पी.एच.डी. अंतिम वर्ष

प्रश्नावली क्र. दिनांक ग्राम
तहसील जिला मों नं.

1. राष्ट्रीय बागवानी मिशन के हितग्राही/अहितग्राही कृषक का नाम
2. उम्र वर्ष
3. जाति (1) अ.जा. (2) अ.ज.जा. (3) अ.पि.व. (4) सामान्य
4. परिवार की सदस्य संख्या.....
5. परिवार का प्रकार (1) एकल (2) संयुक्त
6. शैक्षणिक योग्यता (1) अशिक्षित (2) प्राथमिक स्कूल (3) मिडिल स्कूल
(4) हाई स्कूल (5) हा. से. (6) स्नातक (7) स्नातकोत्तर

7. कृपया आप ग्राम में कार्यरत संस्थाएं एवं उसमें आपकी सहभागिता के बारे में निम्न जानकारी दीजिए।

क्र	संस्थाएं	भागीदारी हां/नहीं	सदस्य	पदाधिकारी
1	ग्राम सभा			
2	जनपद पंचायत			
3	जिला पंचायत			
4	सहकारी समिति			
5	स्कूल समिति			
6	किसान क्लब			
7	भजन मंडली			
6	अन्य.....			

8. कृपया आप अपनी भूमि संबंधी विवरण दें -

- (1) स्वयं की कुल भूमिएकड़ (2) रेगहा पर दी गई भूमि एकड़
- (3) रेगहा पर ली गई भूमिएकड़ (4) कुल कृषि योग्य भूमि एकड़

क्र	भूमि के प्रकार	सिंचित भूमि (एकड़)	असिंचित भूमि (एकड़)	कुल भूमि
1	भाटा			
2	मटासी			
3	डोरसा			
4	कन्हार			

9. क्या आपके पास सिंचाई के साधन हैं? (हां/नहीं) यदि हां तो जानकारी दीजिए।

(अ) सिंचाई के साधन (1) नहर (2) नदी (3) कुंआ (4) ट्युबवेल (5) अन्य.....

10. कृपया आप अपनी विभिन्न व्यवसाय एवं उनसे कुल वार्षिक आय के बारे में जानकारी दीजिए।

क्र	व्यवसाय	मुख्य	सहायक	वार्षिक आय (रु.)
1	कृषि			
2	मजदूरी			
3	स्वतंत्र व्यवसाय			
4	नौकरी			
5	व्यवसाय			
6	अन्य.....			
कुल				

11. क्या आपने कृषि कार्य के लिए ऋण लिया है? (हां/नहीं) यदि हां तो कौन-कौन से फसलों के लिए ऋण लिया है। कृपया जानकारी दीजिए।

क्र.	फसल का नाम	ऋण की अवधि	ऋण की राशि	ऋण की स्रोत	ऋण लेने का कारण
1		लघु / मध्यम / दीर्घ			
2		लघु / मध्यम / दीर्घ			
3		लघु / मध्यम / दीर्घ			
4		लघु / मध्यम / दीर्घ			

(1) ऋण की स्रोत—

(1) राष्ट्रीय बैंक (2) सहकारी संस्था (3) साहूकार (4) अशासकीय संगठन (5) रिश्तेदार
(6) अन्य.....

(2) ऋण लेने का कारण—

(1) बीज खरीदने हेतु (2) उर्वरक खरीदने हेतु (3) दवाई खरीदने हेतु (4) कृषि यंत्र खरीदने हेतु
(5) अन्य.....

12. कृपया आपके घर के प्रकार के संबंध में जानकारी दीजिए।

क	प्रकार	
1	बिना घर	
2	झोपड़ी	
3	कच्चा घर	
4	मिक्स घर (खपरैल + सीमेंट)	
5	पक्का घर (सीमेंट)	
6	हवेली/बड़ा भवन	

13. कृपया आपके पास उपलब्ध कृषि ऊर्जा के संबंध में जानकारी दीजिए।

1	कोई कृषि ऊर्जा नहीं	
2	एक या दो बैल	
3	आयल इंजन/मोटर	
4	बिजली मोटर	
5	ट्रेक्टर	

14. कृपया आपके पास उपलब्ध सामाग्री एवं संसाधनों के संबंध में जानकारी दीजिए।

1	बैल गाड़ी	
2	सायकल	
3	रेडियो	
4	कुर्सी	
5	मोबाइल फोन	
6	टेलीविजन	
7	रेफ्रीजरेटर	

15. क्या निम्नलिखित विस्तार कार्यकर्ताओं से आपका संपर्क होता है? (हाँ/नहीं) यदि हाँ तो कृपया जानकारी दीजिए।

क्र.	विस्तार कार्यकर्ता	जागरूकता हाँ/नहीं	संपर्क का अंतराल		
			नियमित	कभी-कभी	कभी नहीं
1	फील्ड कंसल्टेन्ट				
2	ग्रामीण उद्यान विस्तार अधिकारी				
3	उद्यान विकास अधिकारी				
4	वरिष्ठ उद्यान विकास अधिकारी				
5	वैज्ञानिक				
6	अन्य.....				

16. कृपया निम्नलिखित जन संचार माध्यम के उपयोग के संबंध में जानकारी दीजिए।

क्र.	समूह माध्यम	प्रसार का उपयोग		
		हमेशा	कभी-कभी	कभी नहीं
1	न्यूज पेपर			
2	खेती पत्रिका			
3	रेडियो			
4	टी.वी.			
5	किसान कॉल सेंटर			
6	इंटरनेट			
7	अन्य.....			

17. हल्दी की खेती के बारे में जानकारी प्राप्त करने के लिए आप अपने आस-पास के गांव/शहर/ब्लॉक से कितना संपर्क रखते हैं। कृपया गांव/शहर जाने का अंतराल बताइये?

- 1) कभी नहीं 2) माह में एक बार 3) सप्ताह में एक बार 4) सप्ताह में दो या अधिक बार

18. हल्दी की खेती के बारे में आप अपने वैज्ञानिक दृष्टिकोण के संबंध में विचार व्यक्त कीजिए।

क्र	विचार	पूर्णतः सह मत	सहमत	कुछ नहीं कह सकते	असहमत	पूर्णतः असह मत
1	खेती की नई तकनीक पुरानी तकनीक से अच्छा परिणाम देती है।					
2	किसान के पास खेती का अधिक अनुभव होने के बाद भी उसे नई तकनीक अपनाना चाहिए।					
3	किसान को खेती के नए तरीके सीखने में अधिक समय लगता है, फिर भी किसान को सीखना चाहिए।					
4	अच्छा किसान वही है जो खेती के नए तरीके को अपनाता है।					
5	किसान के जीवन स्तर को ऊँचा उठाने के लिए खेती के पारंपरिक तरीके में बदलाव होना चाहिए।					
6	अपने पुरखों की खेती अपनी खेती से अच्छी थी।					

19. जोखिम से संबंधित निम्नलिखित कथनों से आप किस हद तक सहमत/असहमत है।

क्र	विचार	पूर्णतः सह मत	सहमत	कुछ नहीं कह सकते	असहमत	पूर्णतः असह मत
1	कम जोखिम वाले कम मुनाफे के बजाय एक किसान को अधिक मुनाफे के लिए बड़ा जोखिम उठा लेना चाहिए।					
2	जो किसान अधिक जोखिम उठाता है उनकी आर्थिक स्थिति अन्य किसानों से बेतहर होती है।					
3	किसान को जोखित तब उठाना चाहिए जब सफलता प्राप्ति की संभावना अधिक लगे।					
4	नई विधियाँ जोखिम पूर्ण होती हैं परन्तु उनसे समृद्धता आती है।					
5	अधिक फसलें एक साथ उगाकर जोखिम कम किया जा सकता है।					
6	किसानों को नई तकनीकी तब तक नहीं अपनाना चाहिए जब तक कि अन्य कृषक उसे सफलता पूर्वक न अपना लें।					

20. उपलब्धि प्रेरणा से संबंधित निम्नलिखित कथनों से आप किस हद तक सहमत/सही है।

क्र	कथन	हाँ	कुछ नहीं कह सकते	नहीं
1	व्यक्ति को किसी भी काम की जिम्मेदारी लेकर अथक प्रयास करना चाहिए। जब तक वह परिणाम से संतुष्ट न हो।			
2	व्यक्ति को दृढ़ संकल्प लेना चाहिए और जीवन में उत्कृष्टता प्राप्त करने की इच्छा होना चाहिए।			
3	दूसरों के ऊपर निभर होकर, हम जीवन में आगे बढ़ सकते हैं।			
4	किसी भी काम को और अधिक करने की कोई जरूरत नहीं है, क्योंकि भगवान सब कुछ निर्धारित करते हैं।			
5	जो कुछ भी उपलब्ध है, वह पर्याप्त है और किसी भी नई चीजों को प्राप्त करने की कोई जरूरत नहीं है।			
6	कोई फर्क नहीं पड़ता कि मैंने क्या किया, मैं हमेशा अधिक करना चाहता हूँ।			

21. आर्थिक प्रेरणा से संबंधित निम्नलिखित कथनों से आप किस हद तक सहमत/असहमत हैं?

क्र	कथन	सहमति/असहमति का स्तर				
		पूर्णतः सह मत	सहमत	अनिर्णय	असहमत	पूर्णतः असहमत
1	एक किसान को अधिक लाभ एवं अधिक पैदावार के लिए खेती करना चाहिए।					
2	जो किसान सबसे अधिक लाभ कमाता है वही सबसे अधिक सफल माना जाता है।					
3	किसान को सिर्फ ऐसी नई तकनीक अपनाना चाहिए जो सबसे ज्यादा लाभ दे।					
4	किसानों को ज्यादा लाभ कमाने के लिए अनाज वाली फसलों के बजाय नगद फसलें लेनी चाहिए।					
5	किसी भी नए काम में किसान के बच्चों के लिए अच्छी शुरुआत करना कठिन होता है जब तक वह उन्हें आर्थिक सहायता न दें।					
6	सभी को जीवन में कमाई करना चाहिए मगर पैसा कमाना ही सब कुछ है ऐसा नहीं मानना चाहिए।					

22. हल्दी की खेती का अनुभव वर्ष

23. आपको हल्दी की खेती के बारे में कितनी जानकारी है? कृपया विवरण दें।

क्र	हल्दी की खेती का जानकारी	जानकारी का स्तर		
		पूर्ण	आंशिक	निरंक
1	भूमि की अच्छी जोताई एवं समतलीकरण के लिए कौन-कौन सी क्रियाएं की जानी चाहिए। (मिट्टी पलटने वाली हल फिर कल्टीवेटर से जोताई के बाद पाटा चलाकर समतल करना जरूरी होता है।)			
2	हल्दी की उन्नत किस्मों के नाम बताइयें। (रंगा, रश्मि, सुदर्शन, प्रतिभा, सुगना, प्रभा, रोमा, सुरन्जना, नरेन्द्र हल्दी -1 तथा बी. एस.आर.-2 आदि)			

	3 पेटाश			
12	हल्दी की फसल में कौन-कौन से खरपतवार लगते हैं एवं उनका नियंत्रण किस प्रकार किया जाना चाहिए। खरपतवारनाशी का नाम मात्रा			
13	हल्दी की खेती में कितनी सिंचाई व कितने दिनों के अंतराल में सिंचाई करना चाहिए।			
14	हल्दी की फसल में कौन-कौन से प्रमुख कीट लगते हैं एवं उनका नियंत्रण किस प्रकार किया जाना चाहिए। कीटनाशी का नाम मात्रा			
15	हल्दी की फसल में कौन-कौन से प्रमुख रोग लगते हैं एवं उनका नियंत्रण किस प्रकार किया जाना चाहिए। फफूंदनाशी का नाम मात्रा			
16	हल्दी की खुदाई का उचित समय कौन सा है।			

24. आप हल्दी के बीज/प्रकंद कहां से प्राप्त करते हैं? कृपया जानकारी दीजिए।

- 1) स्वयं घर का बीज
- 2) एन.एच.एम. आफिस से
- 3) बाजार से
- 4) अन्य

			
10	आप हल्दी की खेती में प्रति हेक्टेयर कितनी मात्रा में गोबर की खाद डालते हैं।			
11	आप हल्दी की खेती में प्रति हेक्टेयर कितनी मात्रा में उर्वरक डालते हैं। उर्वरक का नाम मात्रा 1 नाइट्रोजन 2 फास्फोरस 3 पोटैश			
12	आपके हल्दी की फसल में कौन-कौन से खरपतवार उगते हैं एवं आप उनका नियंत्रण किस प्रकार करते हैं। खरपतवारनाशी का नाम मात्रा			
13	आप हल्दी की खेती में कितनी सिंचाई व कितने दिनों के अंतराल में सिंचाई करते हैं।			
14	आपके हल्दी की फसल में कौन-कौन से प्रमुख कीट लगते हैं एवं आप उनका नियंत्रण किस प्रकार करते हैं। कीटनाशी का नाम मात्रा			
15	आपके हल्दी की फसल में कौन-कौन से प्रमुख रोग लगते हैं एवं आप उनका नियंत्रण किस प्रकार करते हैं। फफूंदनाशी का नाम मात्रा			
16	आप हल्दी की खुदाई किस समय पर करते हैं।			

26. क्या आप हल्दी की बीज/प्रकंद का भंडारण करते हैं। (हाँ/नहीं) यदि हाँ तो कृपया जानकारी दीजिए।

क्र.	भंडारण	हाँ/नहीं
1	छाया या ठण्डे घरों में भण्डारण	
2	गड्डे में भण्डारण	
3	बोरी (गनी बेग) में भण्डारण	
4	अन्य.....	

27. क्या आप हल्दी की प्रसंस्करण तथा पालिश एवं रंगाई की विधि को अपनाते हैं। (हाँ/नहीं) यदि हाँ तो कृपया जानकारी दीजिए।

क्र.	प्रसंस्करण तथा पालिश एवं रंगाई की विधि	हाँ/नहीं
1	उपचार करना (Curing)	
2	उबालना (Boiling)	
3	सूखाना (Drying)	
4	रंगाई (Colouring)	
5	ग्रेडिंग (Grading)	
6	पैकिंग (Packaging)	
7	अन्य.....	

28. आप अपनी हल्दी की फसल का क्षेत्रफल एवं उत्पादन बताइये।

क्र	भूमि के प्रकार	क्षेत्रफल (एकड़)	औषत उत्पादन (क्विंटल/एकड़)
1	भाटा		
2	मटासी		
3	डोरसा		
4	कन्हार		
	योग		

29. राष्ट्रीय बागवानी मिशन के संदर्भ में आप अपने विचारों के आधार पर निम्नलिखित कथनों से किस हद तक सहमत/असहमत हैं?

क्र	कथन	सहमति/असहमति का स्तर				
		पूर्णतः सहमत	सहमत	अनिर्णय	असहमत	पूर्णतः असहमत
1	राष्ट्रीय बागवानी मिशन से ग्रामीण क्षेत्रों में रोजगार के नए अवसर पैदा होते हैं।					
2	राष्ट्रीय बागवानी मिशन किसानों को उनकी बगीचों और नर्सरी की उचित देखभाल के लिए प्रोत्साहित करता है।					
3	राष्ट्रीय बागवानी मिशन के तहत कार्यान्वित गतिविधियाँ छोटे और सामान्य किसानों की जरूरत के लिए प्रासंगिक नहीं हैं।					
4	राष्ट्रीय बागवानी मिशन से लाभ प्राप्त करने की प्रक्रिया जटिल है।					
5	राष्ट्रीय बागवानी मिशन व्यक्तिगत और सामाजिक-आर्थिक स्थिति में सुधार के लिए किसानों की मदद करता है।					
6	राष्ट्रीय बागवानी मिशन के कारण फलोत्पादन में वृद्धि फल के विपणन की समस्या पैदा करेगा।					
7	अधिकांश किसानों को समुचित प्रचार-प्रसार के अभाव में राष्ट्रीय बागवानी मिशन के तहत लाभ नहीं मिला है।					
8	राष्ट्रीय बागवानी मिशन उच्च गुणवत्ता वाले आदानों को अपनाने के लिए किसानों की मदद करता है।					
9	फल प्रसंस्करण में लघु उद्योगों की स्थापना से राष्ट्रीय बागवानी मिशन के कारण ग्रामीण क्षेत्रों में वृद्धि होगी।					
10	केवल बड़े किसान ही राष्ट्रीय बागवानी मिशन की विभिन्न योजनाओं के तहत दिए गए लाभ को प्राप्त कर सकते हैं।					

11	राष्ट्रीय बागवानी मिशन के द्वारा काम कम और प्रचार अधिक किया जाता है।					
12	राष्ट्रीय बागवानी मिशन छोटे व सीमांत किसानों के लिए एक वरदान है।					

30. क्या आप राष्ट्रीय बागवानी मिशन की विभिन्न गतिविधियों के बारे में जानते हैं? (हाँ/नहीं) यदि हाँ तो कृपया जानकारी दीजिए।

क्र	गतिविधियाँ	जानकारी
		(हाँ/नहीं है)
1	क्या आपने राष्ट्रीय बागवानी मिशन के बारे में पहले कभी सुना है।	
2	क्या आप अपने क्षेत्र में राष्ट्रीय बागवानी मिशन योजना को लागू करने वाले संस्था/विभाग के बारे में जानते हैं।	
3	क्या आप राष्ट्रीय बागवानी मिशन के मुख्य उद्देश्य के बारे में जानते हैं, जैसे कि बागवानी उत्पादन बढ़ाने, पोषण सुरक्षा बढ़ाने और आय में सुधार करने के लिए है।	
4	क्या आप जानते हैं कि राष्ट्रीय बागवानी मिशन आपके क्षेत्र के लिए कुशल व अकुशल व्यक्तियों के लिए रोजगार के अधिक अवसर प्रदान करता है, विशेष रूप से आपके क्षेत्र के बेरोगार युवाओं के लिए।	
5	क्या आप जानते हैं कि खराब होने वाले बागवानी उत्पादों का प्रसस्करण कटाई पशु प्रबंधन द्वारा राष्ट्रीय बागवानी मिशन की गतिविधियों के अन्तर्गत किया जाता है।	
6	क्या आप राष्ट्रीय बागवानी मिशन की रणनीति के बारे में जानते हैं, जो बगीचों और वृक्षारोपण फसलों की फसल विविधीकरण के माध्यम से छोटे और सीमांत किसानों के जोखिम को कम करने के लिए है।	
7	क्या आप जानते हैं कि नए उद्यानों की स्थापना की योजना प्राप्त करने के लिए प्रति लाभार्थी न्यूनतम क्षेत्र 0.2 हेक्टेयर और अधिकतम 4.0 हेक्टेयर तक है।	
8	क्या आप जानते हैं कि वित्तीय सहायता 60:20:20 के अनुपात में तीन साल तक योजनाओं के लिए प्रदान किया जाएगा।	
9	क्या आप जमीन जायजाद की कानूनी दस्तावेज के बारे में जानते हैं, जो राष्ट्रीय	

	बागवानी मिशन के लिए आवश्यक मापदण्ड है।	
10	क्या आपको पता है कि राष्ट्रीय बागवानी मिशन के तहत जलवायु परिवर्तनशीलता का सामना करने के लिए संरक्षित खेती के तहत ग्रीन हाउस के निर्माण में किसानों की सहायता के लिए प्रावधान है।	
11	क्या आप जानते हैं कि राष्ट्रीय बागवानी मिशन टिशू कल्चर रोपण सामाग्री के साथ केले के उच्च घनत्व वाले रोपण को बढ़ावा देता है।	
12	क्या आप जानते हैं कि राष्ट्रीय बागवानी मिशन परागण बढ़ाने के लिए मधुमक्खी पालन की योजना में भी सहायता कर रहा है।	
13	क्या आप जानते हैं कि राष्ट्रीय बागवानी मिशन, जैविक खेती को बढ़ावा देने के साथ आदान अनुदान प्रदान करके पारिस्थितिकी संतुलन को बनाए रखता है।	
14	क्या आपको पता है कि राष्ट्रीय बागवानी मिशन के द्वारा प्रशिक्षण एवं क्षमता निर्माण कार्यक्रम के तहत मुख्य प्रक्षेत्र का भ्रमण के लिए नवीनतम तकनीकी ज्ञान से अवगत कराने का प्रावधान है।	
15	क्या आप राष्ट्रीय बागवानी मिशन के अंतर्गत फल के पुराने बागों के कायाकल्प और फसले बोने के लिए प्रदान की नगद और आदान के रूप में अनुदान मिलने के बारे में जानते हैं।	

31. राष्ट्रीय बागवानी मिशन योजना में हितग्राही के रूप में चयन का वर्ष बताइये।

32. आप कितने वर्षों से इस योजना में हितग्राही के रूप में हैं।.....वर्ष

33. राष्ट्रीय बागवानी मिशन से हल्दी उत्पादन हेतु प्राप्त लाभ के बारे में बताइये।

क्र	वर्ग	हाँ/नहीं	वर्ष	मात्रा	लगभग मूल्य
1	प्रशिक्षण				
2	प्रदर्शन				
3	अग्रिम पंक्ति प्रदर्शन				
4	परिक्षण				
5	घेराबंदी				
6	भूमि समतलीकरण				
7	जल निकासी				
8	मिनीकिट				
9	बीज सामाग्री				
10	जैव उर्वरक				
11	उर्वरक				

12	खरपतवारनाशी				
13	कीटनाशी				
14	फफूंदनाशी				
15	कृषि यंत्र				
16	अन्य.....				

34. आपको राष्ट्रीय बागवानी मिशन के अंतर्गत चल रही योजना से कौन – कौन से लाभ प्राप्त हुए हैं? कृपया जानकारी दीजिए।

क्र	घटक	हाँ/नहीं	वर्ष	मात्रा/क्षेत्रफल	लाभ लेने का तरीका
अ.	रोपण अधोसंरचना एवं विकास				
1	रोपण सामग्री का उत्पादन –				
	अ. छोटा नर्सरी (2 हेक्टेयर से कम)				
	ब. हाइटेक नर्सरी (4 हेक्टेयर तक)				
	स. बीज का बुनियादी ढांचा				
	1 शुष्क प्लेटफार्म				
	2 भण्डारण बिन्स				
	3 पैकेजिंग यूनिट				
	4 अन्य				
2	नये उद्यानों की स्थापना –				
	अ. फल				
	1 पपीता				
	2 अमरुद				
	3 आम				
	4 सतरा/नींबू				
	5 अन्य				
	ब. मसाले				
	1 हल्दी				
	2 अदरक				
	3 मिर्च				
	4 धनिया				
	5 अन्य.....				
	स. फूल				
	1 गुलाब				
	2 गेंदा				
	3 रजनीगंधा				
	4 ग्लेडियोस				
	5 गैलाडिया				
	6 अन्य				
	द. सुगंधित एवं औषधि फसलें				
	1 लेमन ग्रास				
	2 एलोवेरा				
	3 अन्य				

	इ. पुराने जीर्ण बगीचों का पुनर्जीवीकरण	1	आम					
		2	अमरूद					
		3	संतरा/नींबू					
		4	अन्य					
3	जल संसाधन स्रोतों का निर्माण	1	सामुदायिक जल स्रोतों का विकास					
		2	एकल जल स्रोत/फामे पोण्ड					
4	अ. ग्रीन हाउस	1	500 वर्गमीटर					
		2	>500 – 1008 वर्गमीटर					
		3	> 1008 – 2080 वर्गमीटर					
		4	> 2080 – 4000 वर्गमीटर					
	ब. शेडनेट हाउस	1	1000 – 4000 वर्गमीटर					
		2 वर्गमीटर					
	स. प्लास्टिक मल्विंग	1 वर्गमीटर					
		2 वर्गमीटर					
	द. प्लास्टिक टनल	1 वर्गमीटर					
		2 वर्गमीटर					
	5	पोषक तत्व प्रबंधन व समन्वित कीट प्रबंधन	1	राइजोबियम				
			2	एजोस्पाइरिलम				
3			एजेटोबेक्टर					
4			पी. एस. बी.					
5			अन्य.....					
6	आर्गेनिक कृषि	1	आर्गेनिक खेती					
		2	वमीकम्पोस्ट यूनिट					
		3	अन्य.....					
7	मानव संसाधन विकास	1	अ. किसानों का प्रशिक्षण					
		2	ब. किसानों का प्रभावन दौरा					
8	मधुमक्खी पालन द्वारा परागण सहायता							
9	उद्यानिकी मशीनीकरण	1	ट्रैक्टर, रोटोवेटर					
		2	पावर चालित मशीन					
		3	अन्य.....					
10	एकीकृत कटाई पश्च प्रबंधन	1	अ. पैक हाउस					
		2	ब. कोल्ड स्टोरेज यूनिट					
		3	अन्य.....					

35. हल्दी की खेती को अपनाने में आपको किन-किन बाधाओं/समस्याओं का सामाना करना पड़ता है।
कृपया जानकारी दीजिए ?

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....

36. हल्दी की खेती को अपनाने में आने वाली बाधाओं/समस्याओं को दूर करने के लिए आप अपने सुझाव दीजिए।

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....

Appendix-B



Data collection during the study area











RESUME

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Academic qualification:

Degree	Year	University
B.Sc. (Ag.)	2012	IGKV, Raipur
M.Sc. (Ag.)	2014	IGKV, Raipur
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Membership of professional society: 1. Advances in Life Sciences, DSAS&RD
2. Krishi world, Raipur

Award/Recognitions: 1. National Fellowship Award: In year 2015-16, by UGC
2. Ganga Singh Chauhan Memorial Research Scholar Award,
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Publications: 1. Research paper published: 05
2. Popular articles published: 03

Signature