



## Impact Assessment of National Horticulture Mission on Banana Growers in Assam

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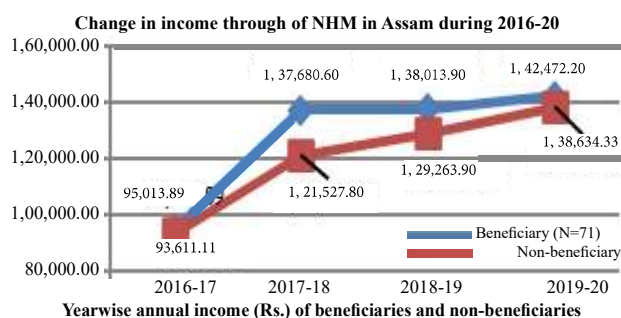
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### HIGHLIGHTS

- NHM is one of the sub-schemes of MIDH implemented by SHM in the year 2005-06.
- For NE states, it was launched as “Horticulture Mission for North Eastern and Himalayan States (HMNEH)”.
- The core objective of the scheme is to promote the area, production and productivity of Horticultural crops.

### GRAPHICAL ABSTRACT



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### ABSTRACT

*Introduction:* Horticulture contributes over 33% to the overall agricultural output in the country in the year 2022. Recognizing the significance of the horticulture sector, the Government of India initiated the "National Horticulture Mission" in the fiscal year 2005-06, while for the Northeastern states, a specific program titled "Horticulture Mission for North Eastern and Himalayan States (HMNEH)" was introduced.

*Context:* Banana holds a significant position in the socio-economic and cultural fabric life of banana growers in rural areas of Assam among the diverse range of fruits grown. Despite its nutritional value and the implementation of schemes leading to increased banana production and expanded cultivation areas, but the productivity levels continue to lag behind the national average.

*Objective:* Therefore, the present study was undertaken during 2020-21 in Jorhat and Kamrup districts of Assam to assess the impact of the mission on banana growers for last four years i.e. 2016-17 to 2019-20.

*Method:* A total of 142 respondents (71 beneficiaries receiving banana suckers from the scheme and 71 non-beneficiaries who already had banana plantations) were selected with the help of random sampling technique. The data were collected using structured schedule and were analyzed with proper statistical techniques viz. frequency, percentage, Chi-square test.

*Results & Discussion:* The beneficiaries had greater positive changes through the scheme as compared to non-beneficiaries. Among the socio-personal characteristics of the respondents, caste of beneficiaries is associated with maximum number of impact indicators. Whereas, family size, farming experience and management orientation were not at all associated with any of the impact indicators.

India enjoys a wide range of climatic and geographical conditions, making it ideal for growing various types of horticultural crops. Fruits and vegetables account for nearly 90% of total horticulture production in the country in the year 2022 (apeda.gov.in, 2023). Though the cultivation of horticultural crops is labour intensive but it creates sizable employment opportunities for rural people, as a result, it has moved from rural confines to commercial front (Ahmad et al, 2018) including protected cultivation (Singh et al., 2017). Total horticulture production in 2020-21 was 334.60 million tonne, which was an increase of about 14.13 million tonne (4.4%) over that achieved in 2019-20. The production of fruits was 102.48 million tonne, compared to 102.08 million tonne achieved in 2019-20 (Press Information Bureau, 2022), while the vegetable production reached to 200.54 MT during 2021-22 (Noopur et al., 2023).

In Assam, the area under horticultural crops is 1.67 lakh ha with a production of 25.18 lakh million tonne and productivity of 15077.84 kg per ha. of fruits (Directorate of Economics and Statistics, Govt. of Assam, 2020). Considering the importance of the horticulture sector, the Government of India launched a centrally sponsored program called *National Horticulture Mission (NHM)* in 2005-06 with the objectives to enhance horticulture production, and improve nutritional security and income of farm households. The scheme is implemented as *Horticulture Mission for the North East and Himalayan States (HMNEH)* for the North Eastern states, Sikkim, Jammu & Kashmir, Himachal Pradesh and Uttarakhand.

Among the various fruits grown in Assam, the banana plays an important role in the socio-economic and cultural life of rural areas, apart from its nutritional value. It is one of the most remunerative crops preferred by farmers for cultivation both in the uplands and lowlands (Issac and Podikunj, 2012). After the implementation of the scheme, banana production has increased and the cultivated area has expanded, but the productivity situation is still below the national average. Hi-tech crop cultivation was a financially feasible business that leads to increased productivity, improved product quality and early harvest (Vitonde and Patil, 2005) and since, the scheme was introduced long back for holistic growth of horticulture crops by supplying quality planting material and protected cultivation, it is always

important to find out the socioeconomic impact of NHM on its beneficiary farmers (Chauhan and Raksha, 2015). In this backdrop, the present study was undertaken to assess the impact of the scheme on beneficiaries concerning changes in production, productivity, women's employment generation etc.

## METHODOLOGY

The HMNEH scheme was more prominently implemented in Kamrup, Jorhat, Sivasagar and Tinsukia districts of Assam. From Central Brahmaputra Valley Zone of Assam, district Kamrup (latitude: 25.9411°N and longitude: 91.2891°E) and from Upper Brahmaputra Valley zone, Jorhat district (latitude: 26.7509°N and longitude: 94.2037°E) were selected randomly to assess the impact of the mission for last four years i.e. from 2016-17 to 2019-20. Three ADO (Agricultural Development Office) circles having the maximum number of beneficiaries who benefited from banana suckers were selected purposively from each district. The selected ADO circles were Madhapur, Borholla and Bagchung of Jorhat district and Borgaon, Ramdia, and Chaygaon of Kamrup district. An equal number of beneficiaries and nonbeneficiaries were selected from each of the selected ADO circles having seventy-one numbers of beneficiaries and seventy-one numbers of non-beneficiaries which makes a total of one hundred and forty-two numbers of total respondents. The beneficiary respondents were selected using the snowball technique method. Beneficiaries were the farmers who received banana suckers under the HMNEH scheme and non-beneficiaries were the farmers of the same area who have not received the scheme but have banana cultivation.

The impact of the scheme was measured



Study area map

concerning changes in area, production, productivity, women's employment generation, changes in income and expenditure, food availability, health status, changes in dwelling houses, asset creation and structural changes and to study the relationship between socio personal characteristics of the respondents with the impact indicators, ten number of variables were selected i.e. age, education, annual income, caste, farming experience, family type, family size, risk bearing ability, management orientation and decision making ability. The main tool of data collection was a pre-tested structured schedule which was collected by the investigator through an interview method during the year 2020-21. The collected data were analyzed with proper statistical techniques viz. frequency distribution, percentage, and Chi-square test.

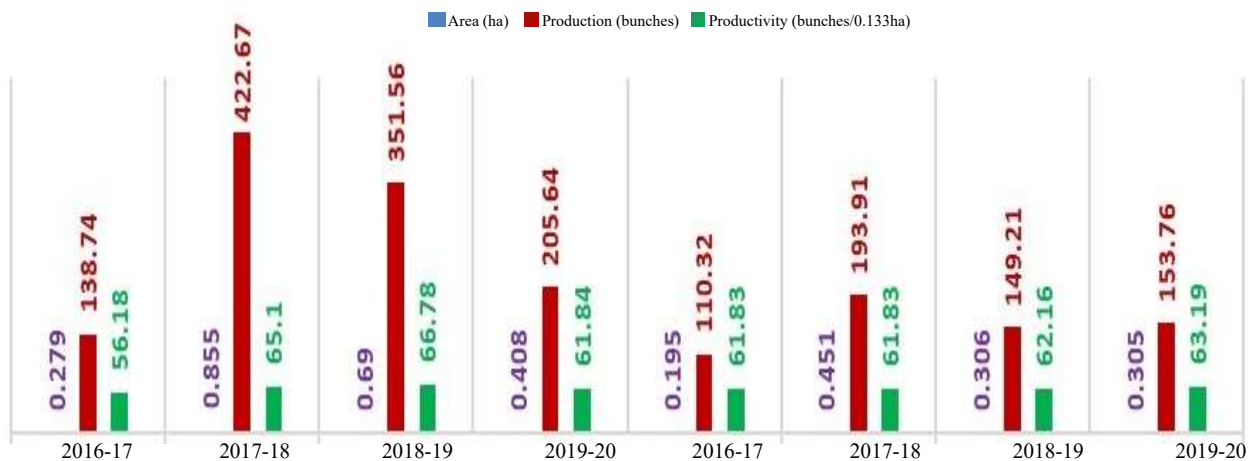
**RESULTS**

The impact of the HMNEH scheme on beneficiaries and non-beneficiaries is presented hereunder.

*Changes in area, production and productivity under banana cultivation:* The data presented in Fig 1 revealed a negative growth in the expansion of area and production but a gradual positive growth in productivity. The area under banana cultivation in case of beneficiaries was gradually declining and it was pronounced during the year 2019-20. It may be because of the reason that at the beginning of the implementation of the scheme, the farmers extended their land for banana cultivation with a hope of getting the more benefits from the scheme. But due to poor soil management and insufficient access to irrigation facilities, they gradually decline their landholding for banana cultivation.

Considering the beneficiaries of 2018-19 and 2019-20, the graph revealed a decreasing trend in the expansion of area, from a peak in the year 2017-18 of 0.855 ha to 0.690 ha and 0.408 ha respectively. In case of the non beneficiary farmers, there was a decrease in area in 2018-19 i.e. 0.306 ha than the previous year which was 0.451 ha and again going down to 0.305 ha during 2019-20. In case of production and productivity also, the graph depicted a decrease in the average production of bananas from 422.67 bunches in 2017-18 to 351.56 bunches in 2018-19 and 205.64 bunches in 2019-20. But productivity of bananas has gradually increased in 2017-18 from 65.10 bunches to 66.78 bunches and 67.84 bunches per 0.133 ha in 2018-19 and 2019-20 respectively. The production of bananas in case of non beneficiary farmers had decreased over the years but the productivity was found to be increasing gradually from 61.83 bunches in 2017-18 to 62.16 bunches and 63.19 bunches per 0.133 ha in 2018-19 and 2019-20 respectively. Singh *et al.*, (2022), Surabhi (2007) and Mankar *et al.*, (2013) also reported the same results from their study. Mukherjee *et. al.*, (2024) in their study also reported that adoption of HQPM1 hybrid maize variety could considerably enhance maize productivity. The productivity was found to be increasing in case of non beneficiaries due to the fact that they want to compete their status of banana cultivation with the beneficiaries.

*Women employment generation (man days):* Women perform backbreaking activities both in the field and in their households, thus leading a hard life (Biradar, 2021). In India, 80 percent of women are engaged in agricultural operations in rural areas and are



**Fig 1. Changes in area, production and productivity**

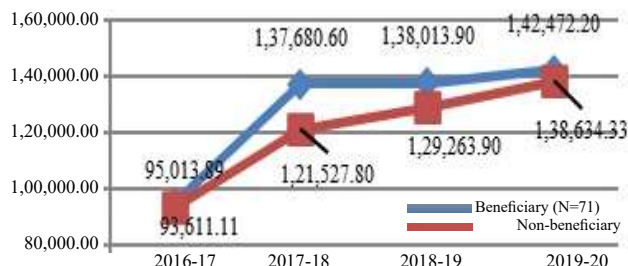
**Table 1. Women employment generation in man days through banana cultivation pre and post HMNEH (N=71+71)**

Years	Beneficiary (n=71)		Non-beneficiary (n=71)	
	Av. man days		Av. man days	
2016-17	6.49		5.15	
2017-18	8.17		6.04	
2018-19	7.16		6.04	
2019-20	6.49		6.27	

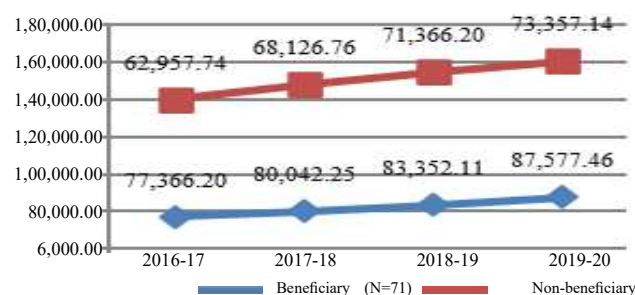
performing domestic chores and equally taking part in farming activities with men folk (Patel *et al.*, 2021), because of their entrepreneurial nature (Saikia and Chauhan, 2021; Chauhan and Saikia, 2022) (Table 1)

Considering the beneficiaries of the scheme, in the year 2017-18, it is observed from the Table 1 that women's employment generated 8.17-man days which was the highest among the four years of study period. In case of the non beneficiaries, it was highest in 2019-20 with 6.27 man days. The observation depicted that women's employment generated in case of beneficiaries was more than that of the non-beneficiaries. The number of women employment generation is decreasing over the years for beneficiaries is may be due to the fact that they expose to insufficient training and extension services tailored to women's needs which untimely hinder their ability to adopt modern horticultural technologies. The sameresults have been found in the study conducted by Ramesh *et al.*, (2017) and Yadav *et al.*, (2022).

*Income from mission (Rs):* Fig 2&3 revealed that the income from the mission has decreased over the years. It was observed that for almost three years, from 2016-17 to 2018-19, the annual income from the mission was almost constant on an average of Rs. 0.42



**Fig. 2. Yearwise annual income (Rs.) of beneficiaries and non-beneficiaries**



**Fig. 3. Yearwise annual expenditure (Rs.) of beneficiaries and non-beneficiaries**

lakhs but dropped to 0.38 lakhs in 2019-20 in case of beneficiaries. The annual income and expenditure of beneficiaries as well as of non beneficiaries have increased over the years. In case of beneficiaries, the annual income has increased from Rs 0.9 lakhs in 2016-17 to Rs.1.4 lakhs in 2019-20 and annual expenditure of Rs 0.77 lakhs in 2016-17 to Rs. 0.87 lakhs in 2019-20. In case of the non beneficiaries, the annual income increases from Rs. 0.93 lakhs to Rs.1.38 lakhs in 2019-20 and annual expenditure from Rs. 0.62 lakhs to Rs. 0.73 lakhs in 2019-20. The findings conform with the findings of Rathod *et al.*, (2015), Godara, *et.al.*, (2011), Pandya *et. al.*, (2015) and Yadav *et. al.*, (2022). In Fig. 2 & 3 annual income for beneficiary increased in 2019-20 but income from mission decreased in same year which means thatthe income share from mission is gradually decline and so is its significant.

**Table 2. Distribution of respondents based on their food availability and changes in health status (N=71+71)**

Parameter	Years	Beneficiary (n=71)			Non-beneficiary (n=71)		
		Adequate	Not so much adequate	Not adequate	Adequate	Not so much adequate	Not adequate
		No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Food availability	2016-17	36(50.70)	25(35.22)	10(14.08)	34(47.88)	27(38.04)	10(14.08)
	2017-18	36(50.70)	25(35.22)	10(14.08)	38(53.52)	27(38.04)	6(8.45)
	2018-19	40(56.33)	21(29.59)	10(14.08)	38(53.52)	27(38.04)	6(8.45)
	2019-20	40(56.33)	21(29.59)	10(14.08)	38(53.52)	27(38.04)	6(8.45)
Changes in health status	2016-17	2(2.8)	14(19.70)	55(77.50)	7(9.87)	25(35.21)	39(54.92)
	2017-18	8(11.26)	12(16.90)	51(71.84)	10(14.08)	25(35.21)	36(50.71)
	2018-19	2(2.8)	19(26.78)	50(70.42)	5(7.04)	20(28.16)	46(64.78)
	2019-20	0 (0.00)	6(8.45)	65(91.55)	7(9.87)	25(35.21)	39(54.92)



**Food Availability:** Considering the beneficiaries, growth was observed in food availability in every next year of scheme implementation i. e. from 31(43.66%) to 54 (76.05%) of beneficiaries had adequate food availability from 2016-17 to 2019-20. In case of non-beneficiaries, not much variation was observed in the availability of food i. e. from 38(53.52%) to 52 (73.23%) during these four years as revealed Table 2.

**Health status:** The data in Table 2 also states that in case of beneficiaries, the frequency of disease occurrence becomes almost nil in the year 2019-20. For the majority of both beneficiaries and non beneficiaries, disease occurred less frequently but comparatively, the health status of beneficiaries is better than that of the non-beneficiaries in the study area. Bananas are a nutritious fruit rich in vitamins, minerals and fiber. Banana farmers may have better

access to this nutritious food source, which can contribute to overall health and well-being and reduce the risk of malnutrition-related health issues.

**Changes in dwelling houses:** The observation in Fig 4 & 5 represented that in the year 2016-17, 30 (42.25%) of beneficiaries and 41(57.74%) of non beneficiaries had kacha houses followed in 2017-18, 10 (14.08%) of beneficiaries had pucca houses and 17 (23.94%) of non beneficiaries had pucca houses. In the subsequent years after the implementation of the scheme, in 2018-19, 24 (33.80%) of beneficiaries renovated their old houses and in case of nonbeneficiaries 10 (14.08%) renovated their old house followed by in the year 2019-20, 7 (9.85%) beneficiaries have constructed new houses and only 3 (4.22%) non beneficiaries have constructed new houses.

**Asset creation:** The data in Table 3 represented that after the implementation of the HMNEH scheme, the creation of assets like land, vehicles, home furniture, kitchen appliances, mobile handsets have increased with a gradual pace. In case of beneficiaries during 2018-19 and 2019-20, the purchasing of assets was

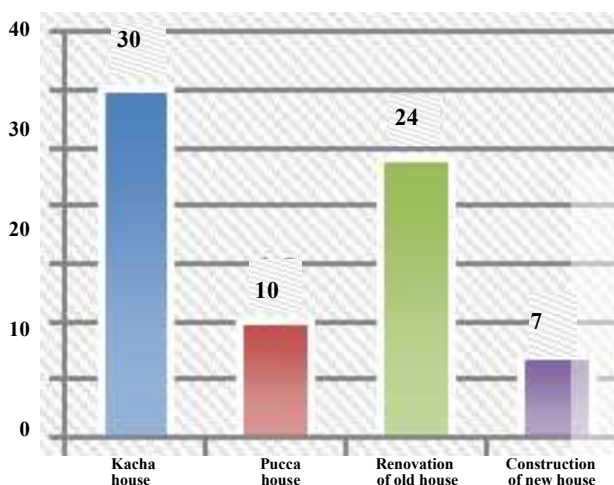


Fig 4. Distribution of beneficiaries based on changes made in dwelling houses (n=71)

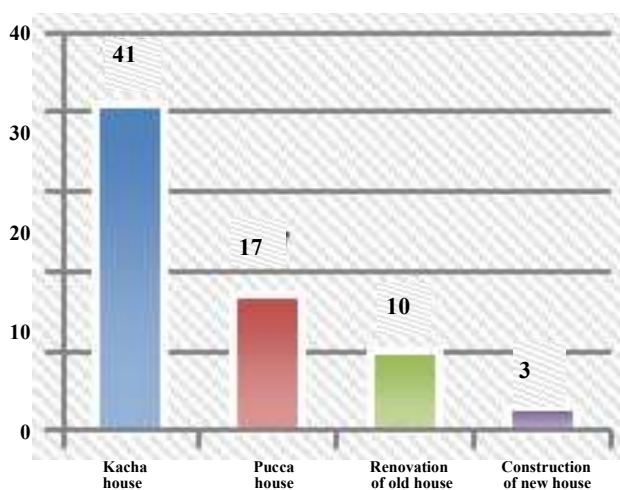


Fig 5. Distribution of non-beneficiaries based on changes made in dwelling houses (n=71)

Item	Years	Beneficiary	Non beneficiary
		(n=71)	(n=71)
		No. (%)	No. (%)
Land	2016-17	2 (2.18)	-
	2017-18	4 (5.63)	5 (7.04)
	2018-19	5 (7.04)	4 (5.63)
	2019-20	-	2 (2.18)
Vehicle	2016-17	2 (2.18)	-
	2017-18	11 (15.49)	11 (15.49)
	2018-19	14 (19.71)	9 (12.67)
	2019-20	-	8 (11.90)
Home furniture	2016-17	5 (7.04)	5 (7.04)
	2017-18	14 (19.71)	8(11.26)
	2018-19	19 (26.76)	9 (12.67)
	2019-20	28 (39.53)	12 (16.90)
Kitchen appliances	2016-17	15 (21.12)	14 (19.71)
	2017-18	19 (26.76)	18 (25.35)
	2018-19	12 (16.90)	11 (15.49)
	2019-20	13 (18.30)	11 (15.49)
Mobile handset	2016-17	-	3 (4.22)
	2017-18	17 (23.94)	19 (26.76)
	2018-19	22 (30.98)	18 (25.35)
	2019-20	32 (45.07)	43.66)

**Table 4. Distribution of respondents based on structural changes made over the years (N=71+71)**

Items	Year	Beneficiary (n=71)		Non beneficiary (n=71)	
		Existed	Created	Existed	Created
		No. (%)	No. (%)	No. (%)	No. (%)
Storage facilities	2016-17	60(84.50)	-	67(94.36)	-
	2017-18	52(73.23)	16(22.53)	52(73.23)	4(5.63)
	2018-19	62(87.32)	10(14.08)	50(70.42)	18(25.35)
	2019-20	64(90.14)	6(8.45)	60(84.50)	9(12.67)
Pump sets	2016-17	14(19.71)	-	9(12.67)	2(2.81)
	2017-18	12(16.90)	2(2.81)	11(15.49)	3(4.22)
	2018-19	12(16.90)	14(19.71)	14(19.71)	2(2.81)
	2019-20	14(19.14)	20(28.16)	16(22.53)	8(11.26)
Water storage facilities	2016-17	18(25.35)	3(4.22)	11(15.49)	12(16.90)
	2017-18	18(25.35)	2(2.81)	11(15.49)	16(22.53)
	2018-19	6(8.45)	29(40.84)	11(15.49)	14(19.71)
	2019-20	17(23.94)	29(40.84)	16(22.53)	10(14.08)
Irrigation	2016-17	18(25.35)	3(4.22)	10(14.08)	5(7.04)
	2017-18	18(25.35)	2(2.81)	15(21.12)	8(11.26)
	2018-19	17(23.94)	23(32.39)	15(21.12)	16(22.53)
	2019-20	17(23.94)	29(40.84)	15(21.12)	20(28.16)
Boundary walls	2016-17	43(60.56)	24(33.80)	45(63.38)	13(18.30)
	2017-18	50(70.42)	21(29.57)	47(66.19)	21(29.57)
	2018-19	58(81.69)	13(18.30)	47(66.19)	23(32.39)
	2019-20	43(60.56)	28(39.43)	47(66.19)	24(33.80)

more i.e5 (7.04%) farmers bought land, 14 (19.71%) bought vehicles, 28(39.43%) bought home furniture, 13 (18.30%) bought new kitchen appliances and 32 (45.0 %) bought mobile handsets as compare to other three years and in case of non beneficiaries, the creation of assets like land, vehicle, furniture appliance except buying of mobile handsets were gradually decreasing or remain same during these four years. Similar results have been found by Bhandari (2014).

*Structural changes:* The observation from Table 4 revealed that structural changes had increased more or less after the intervention of the scheme. The impact of HMNEH on structural changes of banana cultivators is positive. The installation of pump sets, water storage facilities, irrigation system and creation of boundary wall was more among beneficiaries as compared to nonbeneficiaries from 2016-17 to 2019-20 except creation of storage facilities which was more among nonbeneficiaries. The data revealed that the beneficiaries become economically vibrant because of the facts that NHM provides capacity-building programs and entrepreneurial training to beneficiaries. Equipping farmers with business skills, marketing knowledge,

and entrepreneurship capabilities empowers them to explore innovative opportunities, add value to their produce, and effectively manage their farm enterprises for long-term economic growth.

*Relationship of socio-personal characteristics of the beneficiaries with the impact of HMNEH scheme:*

It was revealed from the data presented in Table 5 that the age of the beneficiaries was associated with women's employment generation ( $\chi^2=15.57^*$ ), health ( $\chi^2=10.41^{**}$ ) and food availability status of the family ( $\chi^2=17.08^*$ ). Production ( $\chi^2=10.24^{**}$ ) was associated with beneficiaries' education. Beneficiaries' castes was associated with maximum number of impact dimensions i.e women employment generation ( $\chi^2=50.05^*$ ), income ( $\chi^2=58.23^*$ ), food availability ( $\chi^2=26.44^*$ ), production ( $\chi^2=18.20^{**}$ ), productivity ( $\chi^2=15.93^{**}$ ), health ( $\chi^2=22.58^*$ ), expenditure ( $\chi^2=10.11^{**}$ ), asset creation ( $\chi^2=17.53^{**}$ ) and structural changes ( $\chi^2=48.41^*$ ). Family type is found to be associated with food availability ( $\chi^2=4.73^{**}$ ), health ( $\chi^2=8.29^{**}$ ) and asset creation ( $\chi^2=6.10^{**}$ ). Annual income of the beneficiaries was associated with expansion of land under banana cultivation ( $\chi^2=10.35^*$ ), women employment generation

**Table 5. Relationship of socio personal characteristics of the beneficiaries with impact of HMNEH scheme (N=71+71)**

Variables	Structural Changes	Asset Creation	Family Expenditure	Health	Productivity	Production	Food Availability	Change in Dwelling	Income	Employment Generation	Land Expansion
Age	14.29	5.15 <sup>NS</sup>	0.92 <sup>NS</sup>	10.41 <sup>**</sup>	4.35 <sup>NS</sup>	6.24 <sup>NS</sup>	17.08 <sup>*</sup>	0.24 <sup>NS</sup>	17.30 <sup>NS</sup>	15.57 <sup>*</sup>	4.41 <sup>NS</sup>
Education	1.23	6.58 <sup>NS</sup>	2.98 <sup>NS</sup>	4.34 <sup>NS</sup>	3.47 <sup>NS</sup>	10.24 <sup>**</sup>	0.16 <sup>NS</sup>	0.23 <sup>NS</sup>	3.29 <sup>NS</sup>	7.01 <sup>NS</sup>	
Caste	48.41 <sup>*</sup>	17.53 <sup>**</sup>	10.11 <sup>**</sup>	22.58 <sup>*</sup>	15.93 <sup>**</sup>	18.20 <sup>**</sup>	26.44 <sup>*</sup>	3.85 <sup>NS</sup>	58.23 <sup>*</sup>	50.05 <sup>*</sup>	16.52 <sup>NS</sup>
Family size	1.43	1.61 <sup>NS</sup>	1.05 <sup>NS</sup>	2.52 <sup>NS</sup>	4.98 <sup>NS</sup>	3.47 <sup>NS</sup>	0.58 <sup>NS</sup>	0.43 <sup>NS</sup>	1.75 <sup>NS</sup>	2.58 <sup>NS</sup>	2.63 <sup>NS</sup>
Family type	8.49	6.10 <sup>**</sup>	1.11 <sup>NS</sup>	8.29 <sup>**</sup>	1.18 <sup>NS</sup>	1.34 <sup>NS</sup>	4.73 <sup>**</sup>	0.14 <sup>NS</sup>	4.58 <sup>NS</sup>	7.51 <sup>NS</sup>	4.81 <sup>NS</sup>
Farming experience	1.45	4.20 <sup>NS</sup>	0.86 <sup>NS</sup>	3.82 <sup>NS</sup>	1.40 <sup>NS</sup>	3.58 <sup>NS</sup>	1.03 <sup>NS</sup>	0.63 <sup>NS</sup>	3.85 <sup>NS</sup>	7.68 <sup>NS</sup>	3.31 <sup>NS</sup>
Annual income	4.34	4.27 <sup>NS</sup>	3.85 <sup>NS</sup>	6.12 <sup>NS</sup>	0.56 <sup>NS</sup>	9.72 <sup>**</sup>	1.82 <sup>NS</sup>	4.74 <sup>NS</sup>	10.03 <sup>**</sup>	9.73 <sup>**</sup>	10.35 <sup>**</sup>
Risk bearing ability	3.86	9.50 <sup>**</sup>	0.69 <sup>NS</sup>	5.58 <sup>NS</sup>	5.11 <sup>NS</sup>	7.03 <sup>NS</sup>	4.85 <sup>NS</sup>	0.94 <sup>NS</sup>	7.86 <sup>NS</sup>	8.04 <sup>NS</sup>	7.91 <sup>NS</sup>
Management Orientation	0.37	1.53 <sup>NS</sup>	3.81 <sup>NS</sup>	4.21 <sup>NS</sup>	6.33 <sup>NS</sup>	1.81 <sup>NS</sup>	0.89 <sup>NS</sup>	3.81 <sup>NS</sup>	0.81 <sup>NS</sup>	3.92 <sup>NS</sup>	0.49 <sup>NS</sup>
Decision-making ability	1.79	9.53 <sup>**</sup>	0.69 <sup>NS</sup>	1.37 <sup>NS</sup>	4.39 <sup>NS</sup>	3.13 <sup>NS</sup>	1.14 <sup>NS</sup>	0.84 <sup>NS</sup>	3.09 <sup>NS</sup>	5.85 <sup>NS</sup>	3.32 <sup>NS</sup>

\* = 1% level of significance, \*\* = 5% level of significance, NS = non-significance

( $\chi^2 = 9.73^*$ ), income ( $\chi^2 = 10.03^*$ ) and production ( $\chi^2 = 9.72^*$ ). Risk bearing ability ( $\chi^2 = 9.50^*$ ) and decision-making ability ( $\chi^2 = 9.53^*$ ) of the beneficiary was found to be associated with asset creation. Similar findings were stated by Lanjewar *et al.*, (2011) and Choudhary (2014) but in contrast with the findings of Swandhakar (2012).

## DISCUSSION

Therefore, from the overall results of the study, this may be indicative to the fact that the beneficiaries expanded the area under banana cultivation in the year of scheme implementation as they received banana suckers, fertilizers etc. but in the subsequent years the enthusiasm to increase the area had decreased. In the initial years of scheme implementation, the average area of non beneficiaries also increased and decreased in the subsequent years and it may be because they had heard about the scheme from fellow farmers, so in the hope to avail of the scheme they had increased the cultivation area but could not reap the benefit so did not expand the area. The productivity in case of non beneficiary farmers was observed to increase in the subsequent years, this indicated that non beneficiary farmers must have adopted recommended packages and practices or might have received information from other sources about banana cultivation. It

could be concluded that the impact of the scheme in the expansion of area, production and productivity of banana crops under the scheme had not brought much positive growth over the years as compared to the non beneficiary farmers. But the average area and average production were more than the non beneficiary farmers. This scenario of the impact of the Horticulture mission was same as found in the research study done by Yadav *et al.*, (2022).

The scheme tried to empower women through women's employment generation but the study revealed that the impact of the horticulture mission on women's employment generation in man-days was not so satisfactory and it may be because all scheme-related works are handled by men along and along with that women have less access to resources like credit, inputs like seeds and fertilizers, having lack of awareness and training, market access etc. The results are in conformity with the findings of Jumi *et al.*, (2023).

Though the annual income and expenditure of beneficiaries and non-beneficiaries was increasing over the years but the income from the mission decreased in the subsequent years. So the impact of income from the mission on the annual income and expenditure was not so prominent. It could be concluded that even though the income decreased,

expenditure increased. Therefore, it can be seen that some contribution of the income from the mission was made to the expenditure over the years.

The frequency occurrence of disease among beneficiaries was observed to be decreasing may be due to the health awareness created by the state health department, the existence of Primary Health centers in every village, facilities for vaccination etc. It can also be concluded that bananas itself being a nutritious food must have contributed to the health status of the beneficiaries and also the income has added up to some extent to improve their food habits.

It revealed that after the implementation of the scheme, the renovation of old houses has slightly increased over the years among the beneficiaries. The changes were not prominent but to some extent step by step, they have made changes to their dwelling houses. This indicated that beneficiaries could make little changes in their dwelling houses due to the intervention of the scheme. In the case of non-beneficiaries also not much variation was observed.

Moreover, the creation of assets among beneficiaries was more than among non-beneficiaries after the implementation of the scheme. Similar results have been found by Raut *et al.*, (2016).

## CONCLUSION

Bananas are very extensive and popular among the people of Assam as both the rich and the poor prefer this fruit. Since the HMNEH scheme was introduced for the holistic growth of horticulture crops, it is always important to find out the impact of the scheme on its beneficiary farmers. Therefore, the present study was taken to assess the impact of the scheme on beneficiaries having banana cultivation. The impact of HMNEH on beneficiaries was impressive. There was an increase in production, productivity, and annual income and an improvement in health status, asset creation and structural changes. Therefore, it can be concluded that the scheme improves the overall socio-economic status of farmers. The government should promote the growth of horticulture by providing attractive subsidies to interested farmers and covering more are as under the NHM scheme. Farmers need to be encouraged to utilize NHM and awareness should be created through group meetings conducted locally

as per the guidelines and if followed properly, the effects will be more pronounced and gratifying.

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