Financial Benefit of Mango Cultivation- A Study on the Indigenous Communities in the Chittagong Hill Tracts of Bangladesh

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Abstract

Mango cultivation is a profitable farming system in the Chittagong Hill Tracts of Bangladesh. The formation of CHTs is distinct than other parts of Bangladesh located in the south-eastern corner with maximum of hills suitable for monocultural plantation and horticulture. Various types of fruits cultivation are undergoing throughout the panoramic beauty in the hilly areas by indigenous communities specially mango, orange, guava, litchi, banana, pineapple, jackfruits, papaya, and lemon, etc. In addition to those cultivation, medicinal fruits are producing significantly for example- noni and *corosol* or soursop which are considered to be cancer resistors and are comparatively expensive than others fruits. Furthermore, it is however, seen that some kinds of jungle fruits are sufficiently producing in the hill tracts that contain medicinal and financial value. Indigenous people's livelihoods in CHTs generally procured by agriculture either by wetland cultivation, jhum farming, horticulture and monocultural plantation. In CHTs, a traditional farming system is seen to be extensively used by the indigenous communities known as *jhum* cultivation. Maximum number of families in CHTs produced their livelihoods- rice, vegetable, spices and cotton etc., from jhum cultivation up to the pre and post partition of India. Still a significant number of indigenous people in CHTs depend on *jhum* cultivation. Hence, CHTs was recognized by British Colonial Government as Jhum Bunga, Carpus Mehal or Jum Mehal. This cultivation was the foundation of the indigenous communities in CHTs. Due to the progress of agricultural development, and invention of the high yield verities and innovative equipment, rapid increasing of the population which collectively impact on the tradition farming system which forced indigenous people to adopt the modern agriculture. Among them-mango cultivation is one which have been adopted extensively by them as the means of earning. In this case a significant number of indigenous people are seen to be engaged in mango cultivation. This study is mainly focused on the mango cultivators who solely belong to indigenous communities in CHTs. Mixed methods- qualitative and quantitative research methods have been applied. It is, however, noteworthy to mention here that secondary data have been used which are collected from journals, government reports, newspapers and some others sources. Five respondents, who are engaged with mango production and business, are taken purposively them into consideration in this study. In the first section (highest) is considered who are cultivating mangoes above/ across 10 acres of land followed by the second section (middle) cultivating 5-9 acres, third section (lower) cultivating 1-4 acres, fourth section is considered mango businessman and last one is the pesticide businessman.

Keywords: *Mango cultivation, Economical benefit, Modern agriculture, Indigenous communities, Chittagong Hill Tracts.*

Introduction

The Chittagong Hill Tracts, in short CHTs, a solely mountainous area in Bangladesh. According to Bangladesh Bureau of Statistics- Bangladesh has only 17 percent of forest of which two-third are located in Chittagong Hill Tracts. It is only a tribal community's dominant area where 11 different indigenous communities have been residing since inception. Its position in the state is to the south-eastern corner that shares international border with India and Myanmar (Burma). It is a land of 13,295 square kilometres contribute to 1 percent of land from total land area of Bangladesh (MoCHTA, 2022). Indigenous people are extensively diverse in religion, language, tradition, body structure, economic and political formation, cultivation method, rites and rituals, and ways of life from the mainstream community (Bengali). Their life is closely associated with nature. Jhum cultivation (shifting) is another traditional mode of cultivation incorporated with indigenous people in CHTs. Couple of decades ago, they produce ample of food grains from jhum cultivation when the land was available with minimal population. But, in modern time, it is not feasible to produce sufficient livelihood. Hence, the indigenous people are transforming to horticulture farming from jhum cultivation specially mango farming (Chakma, 2021). The production of rice and others material especially vegetable remarkably deteriorated due to the land scarcity led by the expansion of population and the fertility of land respectively (Chakma, 2021).

CHT in Bangladesh, in one hand, is considered to be one of the most important territory for the production of raw materials. But, on the other, backward region in Bangladesh where poverty prevailed higher than other part of the state. In this area, non-farm income facilities are scarce, and in some cases non-existence. Therefore, mango, woods, bamboo, banana, vegetables, medicinal herbs and other varieties of fruits produced abundantly in CHT. It is the reason addressing CHTs as fruit's storage, basket of fruits and fruits hub (Chakma et al. 2022). Lots of families are engaged in fruits farming. According to Dwaipayan Barua cited by Islam et al. (2017) found 20,000 families are engaged in fruits farming contribute to 20 crores taka as annual revenue.

Chittagong Hill Tracts and its people

Chittagong Hill Tracts of Bangladesh is an international border land of south-east corner comprised by three hilly district, namely-Khagrachari, Rangamati and Bandarban hilly districts. It covers approximately 1 percent from total land of Bangladesh. It is, however, found in CHT comprised by 92 percent highland, 2 percent medium highland, 1 percent medium lowland and 5 percent residential area and water bodies (Islam et al. 2022). Moreover, based on the report of Soil and Land Use Survey- forest occupies 73 percent of land, horticulture 15 percent and terraced cultivation 3 percent respectively (Rasul and Gurung, 2023). Eleven (11) distinct indigenous communities- Chakma, Marma, Tripura, Tanchangya, Khumi, Khyang, Lushai, Mro, Pankhu and Bawm are living harmoniously since decades. Chakma is the largest and major community formed around 50 percent rather than other communities followed by the Marma, Tripura and others. Among them two-third of the indigenous people residing in rural areas who (60 percent) depends on agriculture particularly forestry, fisheries and horticulture for their livelihood (Rasul and Gurung, 2023).

Methodology

In the study of "Financial Benefit of Mango Cultivation- A Study on the Indigenous Communities in the Chittagong Hill Tracts of Bangladesh"- secondary data have been used collected from journals, government reports, newspapers and some others sources. A case study of five individuals from five categories of indigenous people who are engaged with mango cultivation and business sector are taken purposively into consideration. The information of respondents were collected through telephone interview. In the first section (highest) is considered who is cultivating mangoes above/ across 10 acres of land followed by the section two (middle) cultivating 5-9 acres, section three (lower) cultivating 1-4 acres, section four is considered mango businessman and lastly, the pesticide businessman who used to sell pesticide to the farmers.

Objectives

Two major objectives have been taken into consideration in order to fulfil the research undertaken are as follows-

► To study the financial viability of mango cultivation by indigenous people;

► To find out the hurdles faced by the mango cultivators and the entrepreneurs.

Result and Discussion

The following section of the research incorporated with the data in order to find out the scenario of mango cultivation by indigenous people in the Chittagong Hill Tracts of Bangladesh.

Fruit's cultivation and financial benefit

Mango (Mangifera *indica*) is a variety of seasonal fruits. It is considered to be the king of fruits in Bangladesh (Ahmed, 1994) due to the taste, aroma, colour, flavour, and its naturality as organic product (Faruq et al. 2021). Chittagong Hill Tract's soil is suitable for mango cultivation. The soil of CHTs in Bangladesh is considered to be the most fertile land area of Bangladesh. Though the topography of CHT is mountainous, it is however, contribute numerous resources to the state. Among them fruits are mostly highlight. Numerous family and youth are engaged with this profession. Bipul Chakma, a graduate student, can be cited remarkably. He started mango cultivation in 2017 after his graduation with 5 acres of land by spending 75,000 Takas (Bangladesh currency) for 500 Amarapali sampling. It is, however, seen that after two years of plantation he got one lakh Taka as his first annual income. Now, his monthly income is more than five lakh Taka (Chakma et al. 2022). Many of the graduate students are inclining in fruits farming instead of waiting for job. In the Chittagong Hill Tracts, approximately, 38 thousand of small- and large-scale cultivators found to be engaged in fruits cultivation where 44 varieties of fruits are being cultivated extensively (Chakma et al. 2022). Based on the report of Department of Agricultural Extension (DAE), CHT alone contribute to 15 percent of fruits nationwide. In 2017, it is found that approximately 1.5 million tonnes of fruit grown annually which now increased up to 1.8 million tonnes in 2021 by cultivating 92 thousand hectors of land and 99,669 hectors respectively leading to 15 percent higher production than the previous years. It is, nowhere, worth to mention that the market of fruits in CHT contribute to 85 billion Taka annually. DAE further cited that

CHT produced around 1.4 million tonnes of fruits specially referred to six types of fruits- mango, jackfruit, banana, papaya, pineapple and orange contribute to 81 percent fruits production alone. In addition to the above-mentioned fruits, there are also extensively cultivated of 38 different kinds of fruits including dragon, cashew, olive, jujube and naseberry etc.

Mango cultivation in the Chittagong Hill Tracts of Bangladesh

Chittagong Hill Tracts is a land of mountain where 52 percent of forested area located in Bangladesh led to three categories of forest- tropical evergreen forest, tropical semi evergreen forest and tropical moist deciduous forest (SAWTEE, 2002). CHT is comprised by three hilly districts, namely-Khagrachar (2,699.55 sq. km.) of which 603.73 sq.km is under forest, Rangamati (6,116.11 sq. km.) of which 2, 233.84 sq. km. is under forest and Bandarban (4,479.03 sq.km.) of which 2653.54 sq.km is under forest (BBS, 2013). Rangamati is the largest district in CHT followed by Bandarban and Khagrachari district respectively. In the context of forest occupation, Bandarban stands in first rank by having 2653.54 sq. km followed by Rangamati 2,233.84 sq. km and 603.73 sq. km by Khagrachari. Though Rangamati is the largest district in CHT, land under garden occupied lesser than Khagrachari followed by Bandarban district. Both Bandarban and Rangamati district under garden, land occupation ratio negatively changes year by year. While, the ratio of Khagrachari increased every year from 2020- 21 to 2023-24. This is why Khagrachari is called the silent fruits revolutionary district in the Chittagong Hill Tracts (Rahman et al. 2017) and CHT in Bangladesh (The Asianage, 2021). In the case of mango production inside garden Bandarban production ratio remain consistence (13.75; 13.33; 13.87 and 13.48 M. tons) in the above-mentioned year while the production growth rate in Khagrachari increased year by year (53.98; 54.96;54.70 and 55.67 M. tons.). In Rangamati district production rate declined from 32.27; 31.72; 31.43 and 30.85 metric tons. The net production rate of Bandarban is 19.69; 19.15; 19.67 and 51.43 while in Khagrachari 48.03; 49.05; 48.85 and 31.48 and Rangamati 32.28; 31.80; 31.48 and 24.75 metric tons in the year of 2020-21 to 2023-24 respectively. It is, however, seen that the lowest production in Bandarban is 19.15 in 2021-22 and highest production is seen in 51.43 metric tons in 2023-24 while in Khgrachri lowest production is seen in 31.48 metric tons in 2023-24 and highest production 49.05 metric tons in 2021-22, and in Rangamati the lowest production is seen 24.75 M. tons in 2023-24 and highest production 32.28 M. tons in 2020-21 respectively. The overall scenario of mango production in three hilly district, Khagrachari always stand in high position rather than Rangamati and Bandarban district. Many cultivators opined that mango cultivation changing the socio-economic status of indigenous people rather than the traditional farming system. They urged to government for technical and logistic support that will help them to build up their confident and reliability by providing modern technology (Table. 1).

Table 1: Mango Production in the Chittagong Hill Tracts

Areas	Year	Bandarban	Khagrachhari	Rangamati	Total
Area Under Garden (Acres)	2020-21	26.30	38.98	34.72	100
	2021-22	26.60	38.36	35.04	100
	2022-23	24.50	42.86	32.64	100
	2023-24	24.42	42.81	32.77	100
Production of Inside Garden	2020-21	13.75	53.98	32.27	100
	2021-22	13.33	54.96	31.72	100
	2022-23	13.87	54.70	31.43	100
	2023-24	13.48	55.67	30.85	100
	2020-21	28.70	39.02	32.29	100

Production of Outside Garden	2021-22	28.05	40.02	31.93	100
	2022-23	28.47	39.98	31.55	100
	2023-24	67.14	10.63	22.23	100
Inside and Outside Garden (M.Ton)	2020-21	19.69	48.03	32.28	100
	2021-22	19.15	49.05	31.80	100
	2022-23	19.67	48.85	31.48	100
	2023-24	51.43	31.48	24.75	100

Source: BBS, 2023; BBS, 2024

Division wise mango production in Bangladesh

Mango, a tropical to sub-tropical fruits, is favourite fruits for all age people in Bangladesh. Children to old age people eagerly wait to taste these fruits in every season. Most of the people prefer to enjoy this seasonal fruit. It is almost producing all parts of Bangladesh. It is evidence here that Rajshahi division is considered as the kingdom of mango cultivation which alone contribute to approximately 2262880.22 metric tons in the year of 2020-21 to 2023-24, followed by Khulna division- the second highest mango productive division produced 473523.65 metric tons; Rangpur 458506.32 metric tons; Dhaka 340349.28; Chittagong 338703; Mymensingh 230795; Sylhet 138140 and Barisal 78906.42 metric tons respectively. In the above-mentioned year mango produced approximately 4321803.89 metric tons in Bangladesh. In the case of areas under garden Rajshahi positioned highest. Within four years Rajshahi division occupied by mango gardening is approximately 452933.45 hectors followed by Barisal 94899; Chittagong 87067.87; Khulna 79068.12; Dhaka 59481.69; Sylhet 54568.07; Rangpur 51148.11 and Mymensingh 49376 hectors respectively. The highest land covered under garden is seen in the division of Rajshari (48.78) and lowest Mymensingh 49376 (5.32). Even though Barisal is the second highest in land areas under garden but production of mango remained consecutively least (Table no. 2).

Table 2: Division wise mango production in Bangladesh

Divisions	**Areas Under Garden (%)**	**Total Production (M.tons. %)**
Barisal	94899 (10.22)	78906.42 (1.83)
Chittagong	87067.87 (9.38)	338703 (7.84)
Dhaka	59481.69 (6.41)	340349.28 (7.88)
Khulna	79068.12 (8.52)	473523.65 (10.96)
Mymensingh	49376 (5.32)	230795 (5.34)
Rajshahi	452933.45 (48.78)	2262880.22 (52.36)
Rangpur	51148.11 (5.51)	458506.32 (10.61)
Sylhet	54568.07 (5.88)	138140 (3.20)
Grand Total	**94899 (100)**	**4321803.89 (100)**

Source: Source: BBS, 2023; BBS, 2024

Contribution of Chittagong Hill Tracts

Chittagong Hill Tracts, a part of Chittagong division, is an important region of Bangladesh in respect of natural resources. It has the highest record of forest and mountains. Hence, it is considered as the storage of raw materials. The contribution of CHT to Bangladesh is remarkable. It is one of the highest raw material productive region located in the south-eastern part of the state. Moreover, it has also significant record for fruits cultivation and production specially mange, orange, guava, litchi, banana, pineapple, jackfruits, papaya, and lemon, etc.

As already mentioned, the topography of CHT is mountainous which is suitable for monocultural plantation and horticulture. In the world, Bangladesh stands 7th position for mango production while India occupied the first position. It is, however, evidenced that India alone contributes to 9.3 million tons of mango from world production of 14 million tons annually followed by Brazil, Pakistan, Mexico, Philippines, Indonesia, Haiti, China, Bangladesh, Egypt, Sudan, Sri Lanka and Cuba. Before couple of decades ago, commercial fruit cultivation was not initiated in the Chittagong Hill Tracts. In 2004 was marked as the year of commercially fruits production. Based on the report of DAE (Department of Agricultural Extension), there are 1.6 million cultivators in CHTs including marginal, small, medium and large scale from whom 23.93 percent are fruits cultivators.

Table no. 3 reveals the contribution of CHT in Bangladesh. A comparison study of CHT's with Chittagong Division and entire production of Bangladesh demonstrate here from the year of 2020-21 to 2023-24. Furthermore, it covers the land under garden, production of inside and outside garden, and net production in metric tons. In comparison of Chittagong district, CHT contribute to 37.77 percent hectors of land followed by 37.17; 38.75 and 39.49 percent respectively. While CHT to Chittagong division, it contributes to 4.18 percent followed by 3.96; 4.21 and 3.74 percent in the above-mentioned year. And, CHT contribute to 3.76 percent hectors of land followed by 3.58; 3.80 and 2.99 percent in entire Bangladesh. On the other hand, the net production in CHT in comparison to Chittagong district is 18.47 percent metric tons followed by 17.48; 17.44 and 33.81 percent while Chittagong division holds 1.71 percent followed by 1.80; 1.41 and 2.35 percent. Furthermore, in Bangladesh, CHT contribute to 1.56 percent followed by 1.63; 1.30 and 2.27 percent. It is, nowhere, stipulated that Chittagong Hill Tracts significantly contesting with the Chittagong district followed by Chittagong division and Bangladesh. The production rate of mango in CHT comparatively better without which the percentage figure of production cannot be shaped as it is now. That is the reason CHT is dubbed to be the hub of fruits and emerging a silence fruits revaluation in Bangladesh.

Table 3: Comparison amongst Chittagong Hill Tracts (CHT), Chittagong division (CTG) and Bangladesh (BGD).

Areas	**Year**	**CHT to CTG District**	**CHT to CTG Division**	**CHT to BGD (Bangladesh)**
Area Under Garden (Acres)	2020-21	37.77	4.18	3.76
	2021-22	37.17	3.96	3.58
	2022-23	38.75	4.21	3.80
	2023-24	39.49	3.74	2.99
Production of Inside Garden	2020-21	80.60	2.49	2.41
	2021-22	79.55	2.59	2.51
	2022-23	78.99	1.60	1.57
	2023-24	77.78	1.17	1.15
Production of Outside Garden	2020-21	8.52	1.16	1.02
	2021-22	7.97	1.22	1.06
	2022-23	7.99	1.19	1.03
	2023-24	27.40	4.06	3.54
Production of Inside and	2020-21	18.47	1.71	1.56
	2021-22	17.48	1.80	1.63

Outside Garden (M.ton)	2022-23	17.44	1.41	1.30
	2023-24	33.81	2.35	2.27

Source: Source: BBS, 2023; BBS, 2024

Case studies

Some case studies of five mango entrepreneurs are incorporated with the study. Among them three respondents (3) have been taken from the farming sector who are engaged with mango cultivation, one (1) mango business sector and one (1) pesticide businessman. They all belong to indigenous communities from Chittagong Hill Tracts of Bangladesh. The Case studies of five respondents are follows-

Jagot Jyoti Chakma (38) an educated mango cultivator of 3500 mango plantations which spread over 30 acres of land. In this sector, he did not find the bright or successful future anymore and overall, he became disappointed. He opined that in 2024 invested approximately 6 lakhs Taka including labour cost in the garden but could not able to procure the amount due to the lower price. Though the production of mango was sufficient but the price was lower even than expected. He expressed his anguish that if the price of mango fixed to 20 takas per kg. in wholesale rate they would at least have benefited. Apparently, deduction of all cost from 20 takas; 5 takas remained as net income which is lower than expected. It is, however, he further highlighted that it is happening every year with farmer due to the syndicate or controlling the market by invisible entities who always stand against indigenous people. Due to not having the expected price, he did not harvest around 1700 mango tress because of higher labour cost than profit in 2024.

Shanti Bijoy Chakma (52) a mango farmer who has been cultivating mango approximately 500 trees across 5 acres. In his previous life, he has been a businessman. He initiated his mango cultivation since 2005. As having the business experience, he used to sell the mangos directly in market without having the middleman. Furthermore, he said that labour scarcity, lack of wholesales market, unfavourable road and transportation system and lack of quality pesticide is acute in CHT. Annually, his average income from the garden is 4 lakh Takas which is higher than other farming. Moreover, he further addressed that political instability, higher cost of transportation and communication, duplicate pesticide, lack of knowledge and skilled, improper technology, administrative complexity, high rate of municipality tax and labour scarcity are profound in CHT. Having been overcome all these aspects illustrated above, he opined mango farming will be profitable than others farming system and his family having benefited remarkably than the other sector.

Jontu Chakma (35) a mango cultivator of 2 acres of land with 600 mango trees. He has initiated the garden before 5 years in 2020. In his experience, in couple of year he got profit from the garden due to favourable price of 40-50 taka per kg. Ironically, the price now declined up to 7-8 taka per kg. He opined about the benefit of mango cultivation is neutral neither profit nor loss. Nowadays, due to the syndicate, the price of mango relatively became down. Hence, many farmers abandoning mango cultivation. Instead of mango cultivation, they are transferring into jujube *(Ziziphus jujuba)* cultivation which maintained higher price than mango. As a drawback, he pointed out the communication gap between the CHT and city, lack of storage, lack of wholesale market, transportation problem, government patronization, and etc. He, as being mango farmer, finds no more future by cultivating contemporary variety of mango. If anyone now wants to be benefited in mango cultivation, one must have to cultivate high yielding variety of mango based on the market demand.

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Sumit Chakma (45) having a diverse profession in multiple enterprise. By profession he prefers himself to get introduced as a businessman. In addition to that he is also a mango cultivator and businessman, garments entrepreneurs and network engineer. He opined that production of mango in CHT is not a problem. Rather he pointed out the problem marketing system, transportation, scarcity of labour, quality mango production, lack of businessman and so on. He used to sell the mangoes through online. His business motto is to "first taste and then pay". He finds syndicate is the major obstacle in CHT which prohibit the producer and seller. In addition to that administrative sector, municipality tax, and local political party are major bottleneck to the businessman. He further highlighted, nowadays, expenses are higher than output. Hence, marginal, small and medium farmers are being discouraged in mango cultivation. Total 1700 trees of his own garden producing mangoes. Furthermore, he kept a garden of approximately 1000 trees as leased from medium farmer. Last year in 2024 got profit approximately 2 million takas. He urged the government to initiate free environment for sellers and producers, install cool storage for long term preservation, develop the commutation system and transportation, and so on. If all the above-mentioned bottleneck are uprooted then the mango entrepreneurs will be benefited, otherwise he cannot see the future in this sector.

Jewel Chakma (42) a pesticide seller, mango cultivator and farmer. He has started the pesticide business, farming equipment and fertilizer by obtaining a business license from district level agriculture office. He has been engaged with this business for 8 years and financially benefited. Recently, on 11th November 2025, inaugurated another new branch in the market centre which is 4 kilometres away from old business stall. Now, two business stalls are running by his family. He gave time to the local market centre two to three hours daily. Afterwards, when his wife takes in charge than he moved to market centre. He remarked that his family got financial improvement from the year of business he launched. Three bighas of paddy land and 2.5 acres hilly land became possible to buy from the benefit of business. Now, whole family is relying on this business. During the time of 2022 to 2023 was a time of bumper benefit he addressed. After that it got declined remarkably due to the declination of mango price. As a result, famers are relatively being reluctant to continue the mango cultivation further which is also affecting in his business.

Limitations or challenges of the mango cultivators in CHT

Chittagong Hill Tracts, as already mentioned above, topographically hilly region. Majority of the indigenous people reside in the rural areas. Agriculture is the major source of their livelihood specially wet land cultivation. Commercially, fruits cultivation has not been existed before two decades. In Chittagong Hill Tracts, mango farmers and businessmen confront with numerous problem, for example, problem of marketing system followed by scarcity of labour, less quality mango, lack of businessmen, corruption of administrative sector, high rate of municipality tax, lack of cool storage, unfavourable road and transportation system, lack of quality pesticide, political instability, higher cost of transportation and communication, lack of knowledge and skilled, high rate of labour cost, improper technology, communication gap between producer in CHT and entrepreneurs in city, and lack of government patronization.

Conclusion

Bangladesh is a riverine country where agriculture is the major source of income. Among them rice, wheat, sugarcane, maize, jute, papaya and banana are seen to be highest cultivation. Within couple of decades mango has also been started producing commercially. Mango cultivation in some district playing a pivotal role for the upliftment of socio-economical status of farmers. A significant number of entrepreneurs are involved in this sector. In Bangladesh, May to June is the prime month of harvesting.

In this enterprise, the name of Chittagong Hill Tracts has also been enlisted. Despite many families in the hilly region got financially benefited from mango cultivation; there are also prevailing many disadvantages particularly road and transportation system, absent of preservation system, lack of marketing facilities, syndicates in business and price discrepancy which collectively affecting on the indigenous farmers involve in mango cultivation and business. Government must have to ensure training facilities, abolish the syndicate, monitoring price, reduction municipality tax, initiate subside system, and provide high yielding verities in order to facilitating mango cultivators in Chittagong Hill Tracts.

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