STATE-WIDE INVENTORY OF ARECANUT & OTHER HORTICULTURE TREE PLANTATIONS

SAMPLE & OBSERVATION PLOTS

Centre of Excellence

for

Natural Resource Management & Sustainable Livelihoods

Meghalaya Basin Development Authority (MBDA)

REPORT

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MBDA, Shillong

FOREWORD

Horticulture plantations in Meghalaya contribute significantly to rural income and employment. As the sector continues to expand, the need for reliable, field-based data to guide planning and policy has become increasingly important. In this context, the present study 'State Wide Inventory of Arecanut & other Horticulture Tree Plantations' carried out by the Centre of Excellence (NRM & SL), MBDA, bridges the critical data gap about extent of Arecanut and other horticulture plantations in the State and their district-wise distribution.

The distinguishing feature of this study is that it is based on scientific methodology using data from the large number of sample plots distributed across the State in a stratified manner. The field inventory was carried out by the trained Village Community Facilitators (VCFs), whose familiarity with the local conditions and close engagement with farming communities ensured accuracy in data collection. Their efforts were actively supported and coordinated by the dedicated staff of the Centre of Excellence, whose technical guidance and supervision strengthened the overall quality and credibility of the assessment. Data processing, analysis and presentation has also been a herculean task which has been ably done.

The findings presented in this report provide a valuable baseline for understanding the current status, distribution, and potential of arecanut and other horticulture plantations across the State. It is expected that this assessment will serve as an important reference for policymakers, planners, and stakeholders, enabling targeted interventions, improved resource allocation, and the promotion of sustainable agricultural practices.

I commend the efforts of the team CoE (NRM & SL) under the able guidance of the Co-Chairman and Director Dr. S. Ashutosh IFS (Retd) and hope that this report will contribute meaningfully to the continued growth and transformation of Meghalaya's horticulture sector.

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PREFACE

Meghalaya, endowed with rich biodiversity and favourable agro-climatic conditions, holds significant potential for the cultivation of a wide range of horticultural crops. These plantations form an integral part of the State's rural economy, contributing substantially to livelihoods, nutritional security, and local trade. Already increasing number of farmers are raising horticulture plantations. Recognizing the strategic importance of this sector, a comprehensive assessment of arecanut and horticulture plantations across the State has been undertaken to generate primary data on the extent, distribution and species etc, to strengthen planning processes, and formulate informed strategic decisions.

The initiative reflects MBDA's continued commitment to evidence-based planning, sustainable land-use practices, and the promotion of resilient agricultural systems in Meghalaya.

The State-wide Inventory of Horticulture and Rubber Plantations aims to provide a scientific assessment of extent of plantations, number of trees, average spacing, etc, for each district in the State. By establishing a robust baseline of the horticulture resource, the study intends to support strategic decision-making and contribute to the long-term growth and sustainability of the horticulture sector in the State.

It is hoped that the findings of this assessment will serve as a baseline data for policymakers, implementing agencies, researchers, and stakeholders, and will guide future initiatives aimed at strengthening Meghalaya's arecanut and horticulture economy in a sustainable and inclusive manner.

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ACKNOWLEDGEMENT

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1. BRIEF HISTORICAL PERSPECTIVE OF HORTICULTURE PLANTATIONS IN MEGHALAYA

Meghalaya has varied agro-climatic zones, ranging from temperate to tropical, which offer tremendous scope for cultivation of temperate as well as tropical fruits and vegetables. More than two-thirds of the population in Meghalaya depends on agriculture and allied activities for its livelihood. The agriculture sector is of critical importance to the economy and to the well-being of its people. The total geographical area of Meghalaya is 22, 429, 00 Ha, out of which the net cropped area is 3,42,885 ha or 15.28 % of the geographical area. The unutilized potential area is about 5,55,104 ha or 24.75 % of the total area and forest cover is 9,46,089 Ha. Meghalaya is conducive for the development of horticulture due to the large extent of land suitable only for horticultural crops and diversity in agro-climatic factors.

Meghalaya has a monsoon type of climate but with wide variation depending upon altitude and physiographic difference of landmass. While the Shillong plateau (600-2000 mm) has a bracing climate verging towards the temperate type, the lower regions adjoining the Surma and Brahmaputra Valley (100-300m) have a tropical climate.

The Agro-climatic Zones in the State are as follows: -

Sub-Region	Agro-climatic features	Soils	Dominant geographic units
I	Humid and warm with an average rainfall between 1270-2032 mm	Light to medium texture, depth varying between deep to very deep	Hills and rolling and undulating pediment
II	Humid and hypothermic moderately cold in winter and warm in summer rainfall varying between 2800-4000mm	Light to medium texture depth varying from deep to very deep	Upper and middle plateau.
III	Humid and moderately warm summer and severe winter rainfall between 2800-6000mm	Light to medium texture, depth varying from deep to very deep	Upper and middle plateau
IV	Humid and warm high rainfall ranging from 4000-10,000mm	Light to medium texture, depth varying from deep to very deep.	Severely dissected and undulating low hills gentle to steep slope and rolling pediment.

V	Humid and hot, rainfall varying from 2800-4000mm	Light to heavy texture, depth varying from moderately deep to very deep.	Rolling and undulating pediment and valley land having depression

The geo-climatic situation of Meghalaya offers an excellent scope for growing of different types of horticultural crops including fruits, spices, plantation crops, medicinal and aromatic plants of high economic values. Advantages of horticulture crops over traditional food crops are:

- As most of the Horticulture crops are perennials in nature thus also offers bio-mass production and check slash & burn/ jhum cultivation.
- Horticulture crops and their products have high potentiality for export and foreign exchange earnings.
- Generate rural employment opportunity.
- Check erosion and improves ecological balances.
- It enables productive and economical utilization of cultivable wasteland.

Spices such as black pepper, turmeric, ginger and chilies grow abundantly. Plantation crops - tea, cashewnut, coconut and arecanut have been performing well in the State and offer good scope for area expansion.

2. SOCIO-ECONOMIC SIGNIFICANCE OF HORTICULTURE IN THE STATE

Meghalaya holds immense promise for the adoption of organic farming, given its favourable climatic conditions and diverse agro-climatic zones. With abundant rainfall and an ideal climate, conducive to both agriculture and horticulture, the state is poised for organic agricultural success. It boasts a rich variety of high-value crops, including strawberries, ginger, Lakadong turmeric known for its high curcumin content, honey, black pepper, oranges, lemons, pineapples, guavas, litchis, bananas, and jackfruits. Additionally, Meghalaya yields a bounty of temperate fruits such as plums, pears, and peaches, alongside an array of exotic flowers like anthuriums, carnations, and various orchid species. The state also is endowed with substantial production of staple crops like jackfruits and areca nuts.

Areca nut (Areca catechu), commonly known as betel nut is believed to have originated in Philippines or from Malaysia and has been widely cultivated in China, India, Bangladesh, Sri Lanka etc. Meghalaya holds 5th position in the production of Areca nuts, producing 3.3% of total production of Areca nuts in India. Areca nut is grown in every district of Meghalaya.

The average annual income from arecanut plantations in Khasi and Jaintia Hills is approximately INR 5,82,483 whereas in Garo Hills it is INR 4,73,612.

Out of the unutilized potential area for agriculture, about 90% is not settled agriculture, a fact that signifies the availability of land and the potential for large scale horticulture. The hilly terrains and land conditions of the State do not offer much scope in bringing additional area under the wet cultivation, but it possesses vast potential for development of horticulture. Horticulture in Meghalaya is characterized by a wide range of tropical, subtropical, and temperate fruits such as citrus, pineapple, banana, strawberry, pear and plum. Horticulture sector thus has a promising scope for the people of Meghalaya. It augments income and enhances their livelihoods.

3. POLICY SUPPORT FOR HORTICULTURE
Meghalaya State Organic and Natural Farming Policy 2023

Meghalaya is advancing organic agriculture through coordinated State and Central initiatives aimed at promoting sustainable livelihoods. Key programmes include the Meghalaya Organic Value Chain Development for North Eastern Region (MOVCDNER) and the State Organic Mission, which targets the conversion of 1 lakh hectares into certified organic land. Currently, 24,000 hectares are certified, with 8,000 hectares under conversion.

To strengthen these efforts, the State Cabinet approved the Meghalaya State Organic and Natural Farming Policy on 11 January 2023. The policy focuses on income generation, capacity building, technology support, value addition, and market linkages. For its implementation, the Meghalaya Natural and Organic Society for Livelihood and Innovation in Agriculture (MEGNOLIA) was established on 1 June 2023 as the apex body under the Department of Agriculture and Farmers' Welfare.

Certification has been streamlined with the establishment of the APEDA-certified Meghalaya State Organic Certification Body, making Meghalaya the second state in the Northeast after Sikkim to have its own certification agency. A major milestone was the MoU signed between MEGNOLIA and the National Cooperatives of Organic Limited (NCOL) on 20 September 2024 at World Food India 2024, aimed at strengthening procurement, marketing, and ensuring direct compensation to farmers.

These initiatives collectively position Meghalaya as a growing leader in sustainable and profitable organic agriculture.

Policy Initiatives – State Government

- **State Flagship Enterprise Promotion Programme:** The State flagship enterprise promotion program called PRIME (Promotion and Incubation of Market- driven Enterprises) was launched on 22 January 2020. Under this program, Prime Hubs are

being set up at different locations of the State as one–stop-shops for all entrepreneurship related services. The Meghalaya Entrepreneurship Promotion Strategy is a big step in developing and promoting entrepreneurship for the citizens of Meghalaya. The intent of the strategy is to foster entrepreneurship and guide the potential entrepreneurs to build a strong entrepreneurship-focused ecosystem called "Promotion and Incubation of Market-driven Enterprises" (PRIME) that can cater to all segments of entrepreneurs viz., startup entrepreneurs, nano entrepreneurs and livelihood entrepreneur, etc. The strategy also recognizes the importance of easy availability of credit, relevant technology, skilling, mentoring support, access to high leverage markets in supporting their growth. With a special focus on access to finance and markets, it aims at creating a robust financing opportunities to entrepreneurs as well as the approach to provide support in value chain development across sectors as well as forge meaningful partnerships. So far, it has benefited about 1,250 entrepreneurs and 96 entrepreneurs have received zero interest loans. Another 117 entrepreneurs have received startup grants under the PRIME program. Four PRIME hubs are already functional and an amount of ₹25 crore has been allocated in the Budget 2022-23 to set up 15 more PRIME hubs during the year. PRIME Programmes has significantly helped horticulture growers.

- **FOCUS Scheme for FPOs:** FOCUS scheme is a flagship initiative of Govt. of Meghalaya to provide market access and financial assistance to farmers' co-operatives. This scheme was launched on 01 September 2021. The Government of Meghalaya has allocated `200 crores for the FOCUS (Farmers' Collectivisation for Up Scaling Production & Marketing System) scheme which will be utilised for farmers, producer groups & entrepreneurs to help them in their ventures VIZ., support in funding, value chain development, machinery support, market linkages, transportation and aggregation of produce are a few of its services. Under the program, the government is providing an initial mobilization fund of ₹5,000 to each member of the producer group for undertaking agri. related activities. About 82,000 farmers have already benefited from the program. For 2022-23, the target is to cover all the 4.5 lakh farming households Meghalaya in the State. An allocation of ₹150 crore for 2022-23 has been made to achieve this target.

- **Farmers' (Empowerment) Commission:** The Meghalaya Farmers' (Empowerment) Commission was set up in May 2019 by Govt. of Meghalaya to systematically look into the issues faced by the farmers in the State. The farmers Commission will act as a bridge between the farmers and the government and would study and identify key

issues of farmers in the state of Meghalaya and will also suggest remedial measures to make farming sector more attractive and remunerative for farmers and the youth. The Commission shall formulate short term and long term policy measures for the benefit of the farmers and devise ways and means for better implementation of policies relating to agriculture, horticulture, allied sector, food processing, value chain development in the state.

- **Mission Lakadong:** The Government of Meghalaya, with a view to encourage organized aggregation and marketing of the famous Lakadong variety of turmeric of Meghalaya has set up Mission Lakadong in 2018 which intends to scale up Lakadong turmeric related activities in West Jaintia Hills and implement future interventions in a convergent mission mode. The Mission has the following objectives/ components:
  - o Increasing the production of Lakadong turmeric to 50,000 MT from the present level of about 10,000 MT.
  - o Increase the productivity from 6 MT per hectare to 28 MT per hectare.
  - o Increase area under cultivation to 6,070 hectares from the current 2,577 hectares.
  - o Register for geographical Indication (GI).
  - o Induction of latest technology and management practices for enhancing the availability of quality planting material through establishing tissue culture labs in key locations of Meghalaya.
  - o Creation of an ecosystem that catalyses the emergence and growth of local private enterprises in the value chain through a dedicated capacity building process and establishing market linkages.
  - o The Lakadong mission will have a specific time frame of 05 years from 2018 to 2023.

The State has been selected for making a Turmeric Export Zone in the West Jaintia Hills District. Under the Lakadong Mission, the production of turmeric has increased from 6,500 metric tons to 12,800 metric tons over the last three years. Fifteen processing units are being set up across Laskein and Thadlaskein blocks in West Jaintia Hills. During 2022-23, an additional area of 500 hectares will be brought under Lakadong cultivation and a curcumin extraction unit has been set up. An amount of ₹10 crore has been earmarked for these initiatives for 2022-23.

- **Mission Jackfruit:** Jackfruit is one of the most versatile fruit tree crops which has been hailed as a miracle fruit food crop for its nutritional and health properties with every part of the tree having some utility or the other- the fruits and seeds for value

addition, food security and medicinal purposes, the leaves for animal fodder, the timber for furniture and construction, and the roots for water conservation. In addition, the tree is also an excellent candidate for incorporation into a climate change adaptation programme due to its versatility and hardiness. The State Government of Meghalaya, with a view of leveraging the suitable agro climatic condition, has launched a five-year Mission Jackfruit in 2018 with the following objectives:

- To promote sustainable rural and urban livelihoods through processing & value addition of jackfruit small scale and nano-enterprises.
- Creation of a value chain for jackfruit products.
- Addressing food security & nutritional issues in the long run.
- Protection and preservation of catchment areas.
- Providing an additional source of income for rural and urban families.
- Develop market for jackfruit and its value added products

- **Meghalaya Commercial Crops Development Board (MCCDB):** The Meghalaya Commercial Crops Development Board (MCCDB) which was established in 1997 is a statutory corporate body that aims to promote the cultivation, processing, and marketing of horticultural and plantation crops to improve farmers' livelihoods and strengthen the State's economy, while gradually reducing harmful jhum cultivation practices. It functions to promote commercial crop cultivation through technical and financial assistance, assisting farmers in procuring quality seeds and inputs, facilitating establishment of processing units and marketing infrastructure, etc. The Board covers numerous crops of which arecanut is also featured.

4. RATIONALE FOR THE STATE-WIDE INVENTORY OF THE HORTICULTURE PLANTATIONS

The State-Wide Field Inventory provides a scientifically assessed baseline of the resource for planning, monitoring, and investment proposals in Meghalaya's horticulture sector. This assessment is a landmark initiative aimed at generating reliable, ground-verified data on the extent and distribution of the horticulture species and rubber plantations in the State. Given the economic importance of arecanut and other horticulture tree crops in supporting rural livelihoods, this inventory serves as a critical data for policy and planning programmes for the development of the sector.

The exercise enables estimation of plantation area, number of trees and spatial distribution at the district and block levels. Such data strengthens crop planning, input management, and productivity enhancement strategies. It also facilitates the identification of high-potential clusters for value addition, processing infrastructure, and market linkages.

From a governance perspective, the inventory enhances transparency and accountability in scheme implementation by providing a verifiable database for beneficiary targeting, monitoring, and impact assessment. It supports convergence across the departments and improves the design of subsidy, replantation, irrigation, and extension programmes.

The inventory is equally significant in the context of climate resilience and sustainability. By assessing tree-based agricultural systems, it contributes to carbon stock assessment, agroforestry promotion, and ecosystem service valuation. This is particularly relevant for exploring climate finance and carbon market opportunities linked to perennial crops such as arecanut.

Furthermore, the database strengthens Meghalaya's positioning in national and international markets by enabling traceability, certification support, and quality standardization. It also assists in disaster response planning by providing baseline information for damage assessment and recovery planning.

Overall, the State-wide Field Inventory establishes a robust data foundation for transforming Meghalaya's arecanut and horticulture sector into a data-driven, climate-resilient, and market-oriented growth trajectory for rural prosperity.
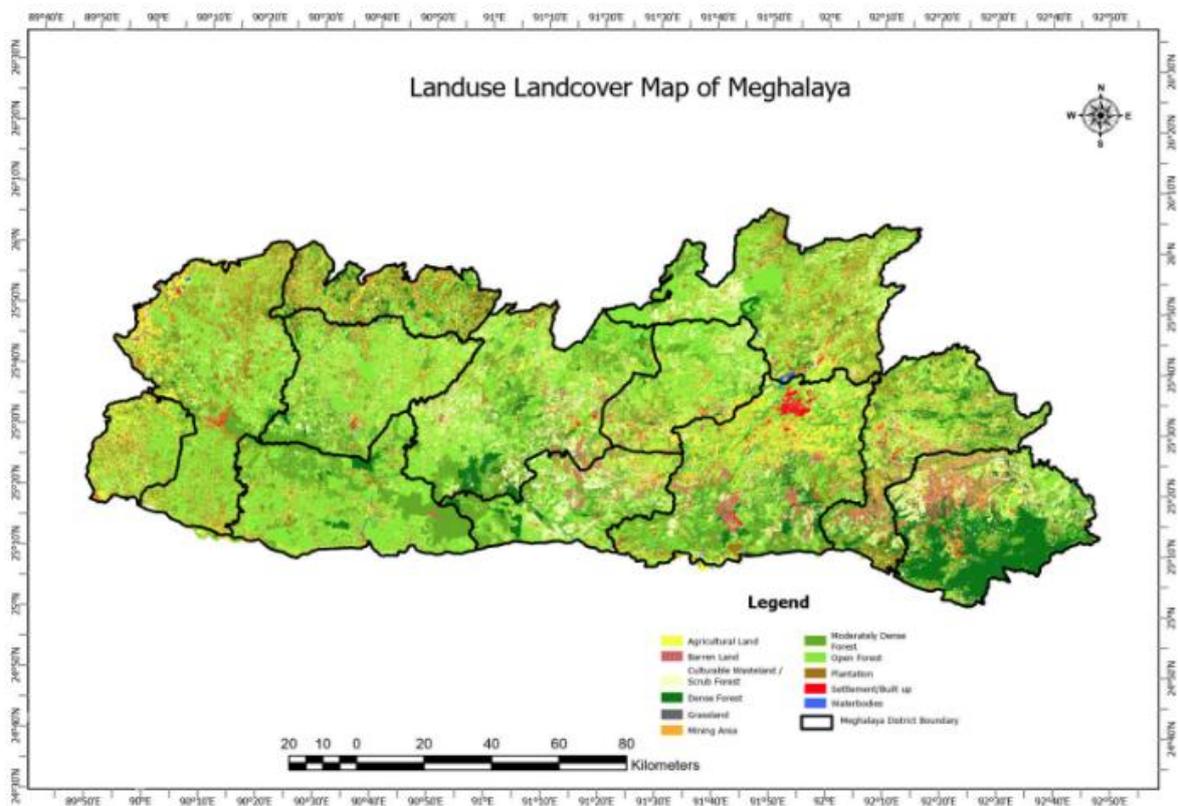
Fig. 1: Land Use & Land Cover of Meghalaya

5. STATE'S LAND USE LAND COVER PROFILE

According to the latest land use land cover mapping done by NESAC ON 1:4000 scale the State's LULC is presented as follows.

Table 1: Land Use & Land Cover of Meghalaya

Sl. No.	LULC Class	Area (ha)
1	Agricultural Land	199635
2	Barren Land	76694
3	Culturable Wasteland/ Scrub Forest	319432
4	Dense Forest	151918
5	Grassland	79
6	Mining Area	6542
7	Moderately Dense Forest	355561
8	Open Forest	874707
9	Plantation	169361
10	Settlement/ Built up	52484
11	Water bodies	36488
	Total	**22,42,900**

6. METHODOLOGY

For the state-wide inventory of arecanut and other horticulture plantations in the State, a stratified random sampling approach has been followed. A state-wide large-scale Land Use/Land Cover (LULC) map at 1:4000 scale, generated by the North Eastern Space Applications Centre (NESAC) was used as the base dataset. The plantation layer was extracted from the LULC layers using GIS tools which was used as the plantation strata for the inventory design. Based on the extracted plantation layer, random sample plots were generated with unique plot-id and their geographic coordinates were extracted block-wise and district-wise in a tabular format.

Village Community Facilitators (VCFs) were engaged for field data collection. Prior to the commencement of the fieldwork, extensive training was conducted for the VCFs covering GPS navigation, plot layout procedures, measurement techniques, and proper filling of data collection formats. Field surveys were conducted using two standardized formats: inventory on sample plots and simple observation to check whether plantations exist on the sample

points or not and if they exist then the species of plantation are also noted. Forty percent (40%) of the total sample plots were allocated for sample plot inventory surveys, while sixty percent (60%) were assigned for observation surveys. For both the surveys, field teams were required to locate the assigned sample plots using GPS coordinates corresponding to the Plot IDs. The exercise involved sample plot measurements on nearly 3000 plots and observations on approximately 5000 plots. Fig. 3 shows the sample plot distribution in the State. For inventory surveys, sample plots as shown in Fig. 2 were laid out using measuring tapes and ropes, with a diagonal distance of 14.14 m measured individually from the centre to each of the four corners, forming a 20 m × 20 m square plot (0.04 ha). Within each plot, data on plot location, administrative details, plantation status, ownership, year of establishment, and species composition were recorded, along with species-wise tree counts for each species present, classified into size classes such as small, medium, and large. To estimate the average spacing between plants, the distance between three trees of the same species was measured in an L-shaped configuration, recorded as X and Y distances. The spacing measurement was repeated for four times in a plot for every species, depending on the availability of sufficient trees of the same species.

For observation surveys, only basic plot information was recorded, including location details, plantation presence, and species observed.
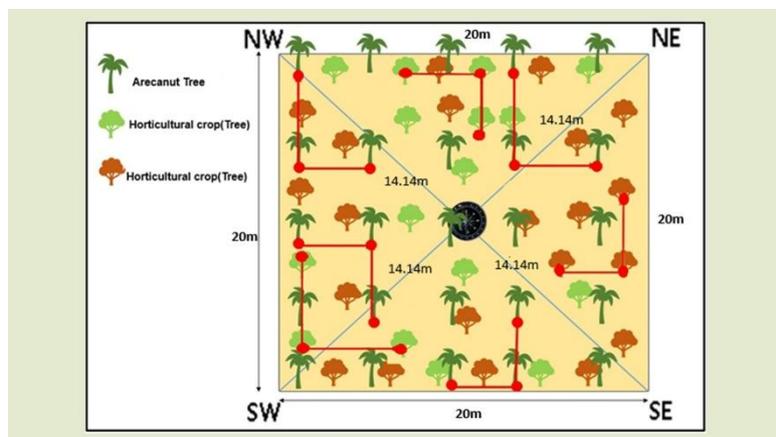
Fig. 2: Lay-out of Sample Plot for the Inventory

Collected field data were entered and the same were checked properly. As the remote sensing derived plantation layer may not represent the plantation extent with reasonable accuracy due to interpretation limitations, therefore errors of commission and omission were assessed and applied to derive the Effective Plantation Area in the State including arecanut plantation, orange, cashew and other horticulture species and also rubber plantations (which is not a horticulture species). The corrected plantation area was subsequently used for species-wise area estimation and estimation of species-wise number of trees for each district. Other

parameters that were estimated include intra-species average spacing and species wise average income per hectare. Average production of arecanut per hectare was also estimated. The estimates of plantation area of different species are expected to be in the range of +- 8% at 95% confidence level.
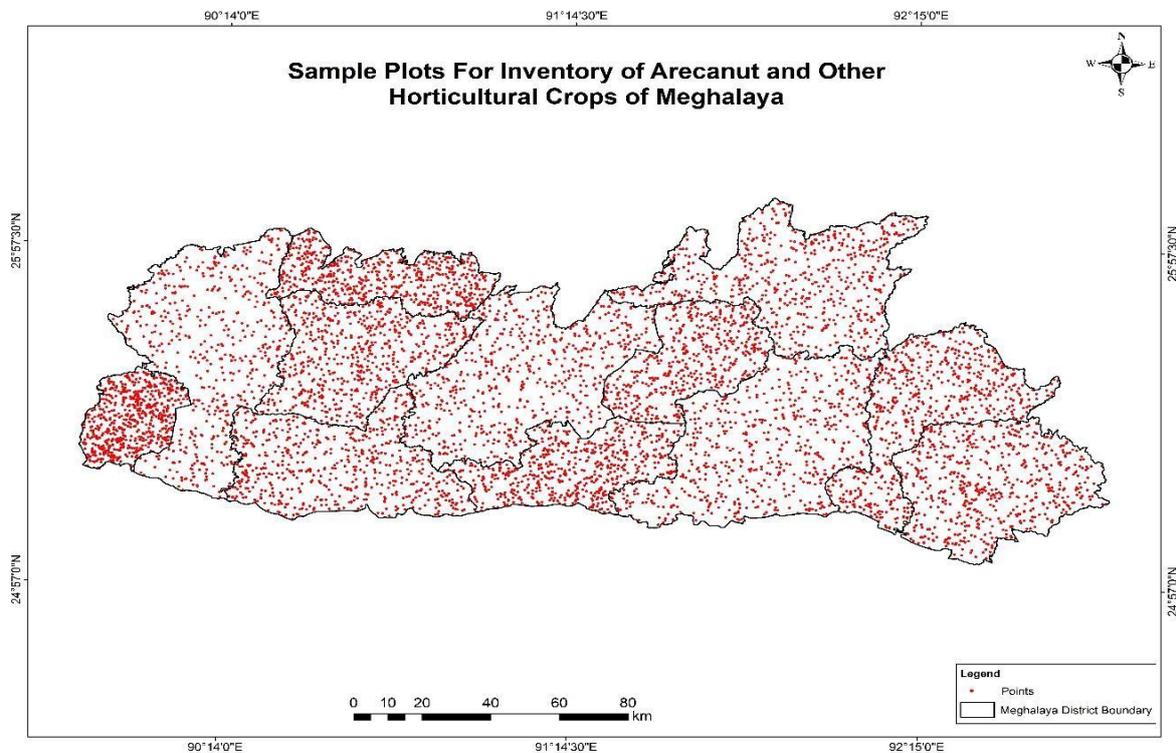
Fig. 3: Sample plots for the Inventory of Arecanut and Horticulture Crops

7. RESULTS OF THE INVENTORY

Table 2 presents the district-wise estimates of plantation area, number of trees, and average spacing for five crop categories namely arecanut, cashew, orange, rubber, and miscellaneous horticulture tree species across eleven districts. The total plantation area covered under these crops is 172,355 ha which is 7.7% of the Geographical Area (GA) of the State. Among all crops, Arecanut occupies the largest area 92,352 ha (4.1% of GA), followed by Miscellaneous species 65,396 ha (2.9% of GA). Plantation of orange 7,795 ha (0.3% of GA), rubber 4,338 ha (0.2% of GA), and cashew 2,474 ha (0.1% of GA) constitute comparatively smaller shares. This clearly indicates that arecanut is the dominant plantation crop in the region.

In terms of tree population, the total estimated number of trees stands at 301,863,167, of which arecanut accounts for an overwhelming 229,226,700 trees, reaffirming its predominance. Miscellaneous species contribute 60,482,066 trees, while orange, cashew, and rubber together account for a relatively smaller proportion.

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District-wise analysis shows that West Garo Hills records the highest plantation area (46,686 ha) and tree population (85,108,517), followed by Ri-Bhoi and North Garo Hills. Districts such as South West Khasi Hills and West Khasi Hills & Eastern West Khasi Hills reflect comparatively lower plantation coverage.

The average spacing data reveals that arecanut plantations are generally maintained at closer spacing (around 1.5 m × 1.6 m to 2.1 m × 2.1 m), resulting in higher tree density. In contrast, crops such as orange and rubber are planted at wider spacing, which corresponds to lower tree densities per hectare.

Overall, the table highlights the strong reliance on arecanut cultivation across districts, alongside a significant presence of diversified horticultural crops. The data provides valuable insights for district-level planning, resource allocation, and future expansion of plantation-based agriculture.

Overall, the data indicates a strong predominance of Arecanut plantations across the state, with significant regional concentration of plantation activity in West Garo Hills, Ri Bhoi, and North Garo Hills.

Many fruit species were observed on the sample plots in every district. However, for the sake of simplicity in presenting the statistics, several species have been grouped as miscellaneous. The miscellaneous category includes fruits such as gooseberries, banana, burmese grape, coconut, guava, jackfruit, lemon, litchi, mango, papaya, pear, pepper, pineapple, plum, pomelo, star fruit, tamarind, etc.

Table 2: Estimate of Plantation Area and Number of Horticulture Trees in Meghalaya

Sl. No.	District	Estimate of Area (ha)						% of GA*	Estimate of number of trees						Average spacing (in meter)				
		Arecanut	Cashew	Orange	Rubber	Misc.	Total		Arecanut	Cashew	Orange	Rubber	Misc.	Total	Arecanut	Cashew	Orange	Rubber	Misc.
1	EKH	7930	0	1431	0	9488	18849	6.9	24075314	0	572480	0	3454420	28102214	1.6 x 1.7	-	5 x 5	-	4.6 x 6
2	WKH & EWKH	1427	0	208	0	1240	2875	0.7	3369375	0	144375	0	825939	4339689	2 x 2.1	-	3.2 x 4.6	-	3.9 x 3.9
3	SWKH	376	0	426	0	380	1182	0.8	1119046	0	436826	0	364632	1920504	1.8 x 1.9	-	3.6 x 2.7	-	3 x 3.4
4	RB	14230	0	1284	0	11761	27275	11.1	33707715	0	1818333	0	16450275	51976323	2 x 2	-	2.4 x 2.9	-	3.7 x 1.9
5	EJH	600	72	368	0	620	1660	0.8	1421375	84297	272344	0	2627895	4405911	1.8 x 2.3	2.8 x 3.1	3.7 x 3.6	-	2.9 x 3.7
6	WJH	1662	0	196	0	4130	5988	3.4	6631915	0	498316	0	7483036	14613267	1.5 x 1.6	-	1.7 x 2.3	-	2.4 x 2.3
7	EGH	7330	280	1200	1157	3882	13849	9.6	19021645	104758	1008522	552201	2207790	22894916	1.8 x 1.8	4.9 x 5.5	4.2 x 5.2	4 x 5.2	3.6 x 4.8
8	WGH	28856	897	1508	1213	14212	46686	16.6	68865861	1167150	717938	802165	13555403	85108517	2.1 x 2	2.7 x 2.9	6 x 3.5	3.6 x 4.2	3.4 x 3.1
9	NGH	13011	573	550	1164	14644	29942	25.8	29037300	365090	247986	780696	10964462	41395534	2.1 x 2.1	4 x 3.9	4.3 x 5.1	3.5 x 4.2	3 x 4.4
10	SGH	5307	495	325	608	4854	11589	6.1	13916196	1127578	632697	350802	2456070	18483343	1.9 x 2	2 x 2.2	2.3 x 2.2	3.4 x 5.2	4 x 4.9
11	SWGH	11623	157	299	196	185	12460	14.4	28060958	81769	288138	99940	92144	28622949	2 x 2	4.5 x 4.2	3.4 x 3	5 x 3.9	3.4 x 5.9
	Total	92352	2474	7795	4338	65396	172355	7.7%	229226700	2930642	6637955	2585804	60482066	301863167					

EKH: East Khasi Hills; **WKH & EWKH:** West Khasi Hill & Eastern West Khasi Hills; **SWKH:** South West Khasi Hills; **RB:** Ri Bhoi; **EJH:** East Jaintia Hills; **WJH:** West Jaintia Hills; **EGH:** East Garo Hills; **WGH:** West Garo Hills; **NGH:** North Garo Hills; **SGH:** South Garo Hills; **SWGH:** South West Garo Hills
* GA = Geographical area of the district

District wise Plantation Area (in ha)
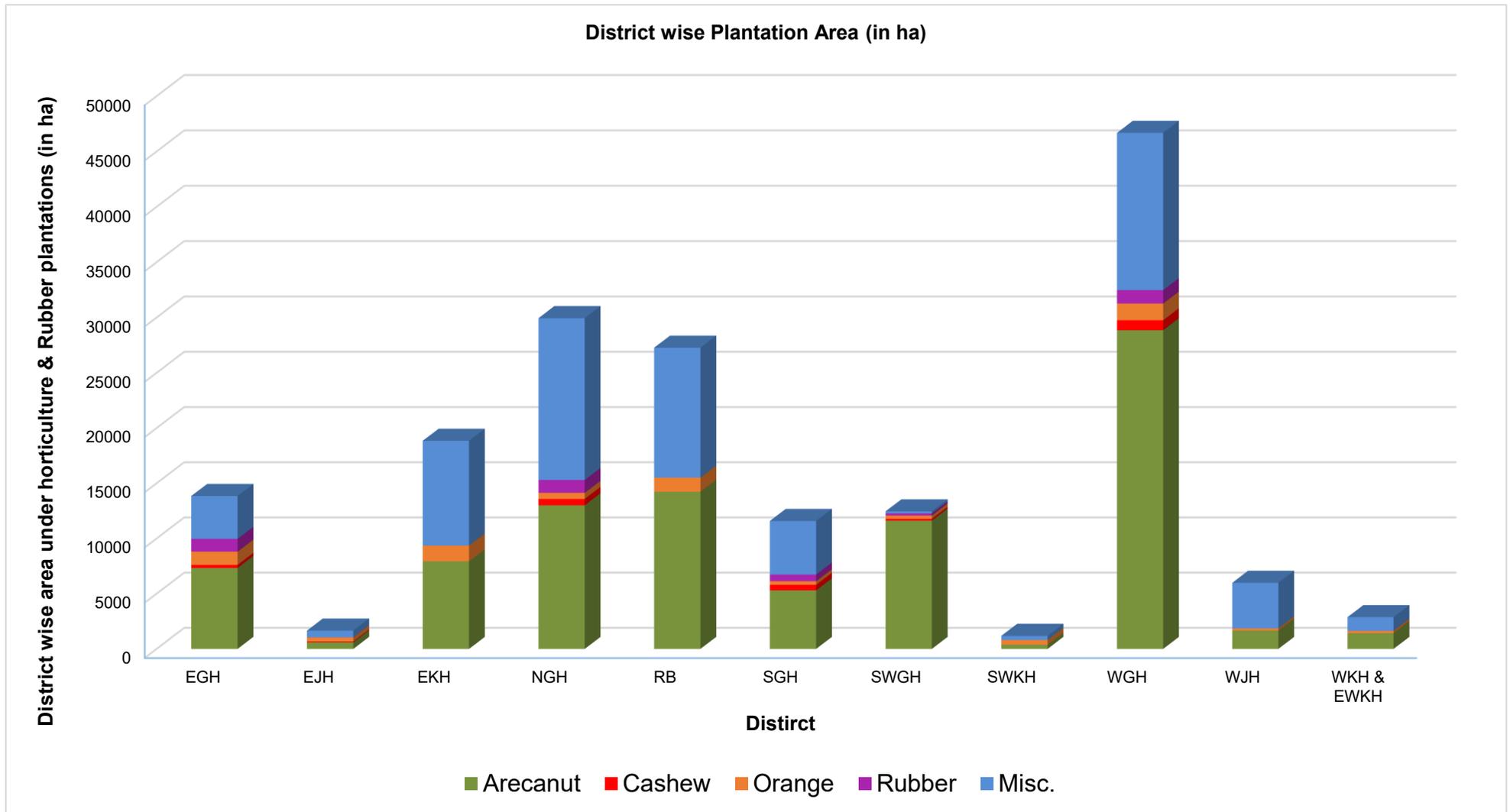
Fig. 4: District wise area under Horticulture & Rubber plantation
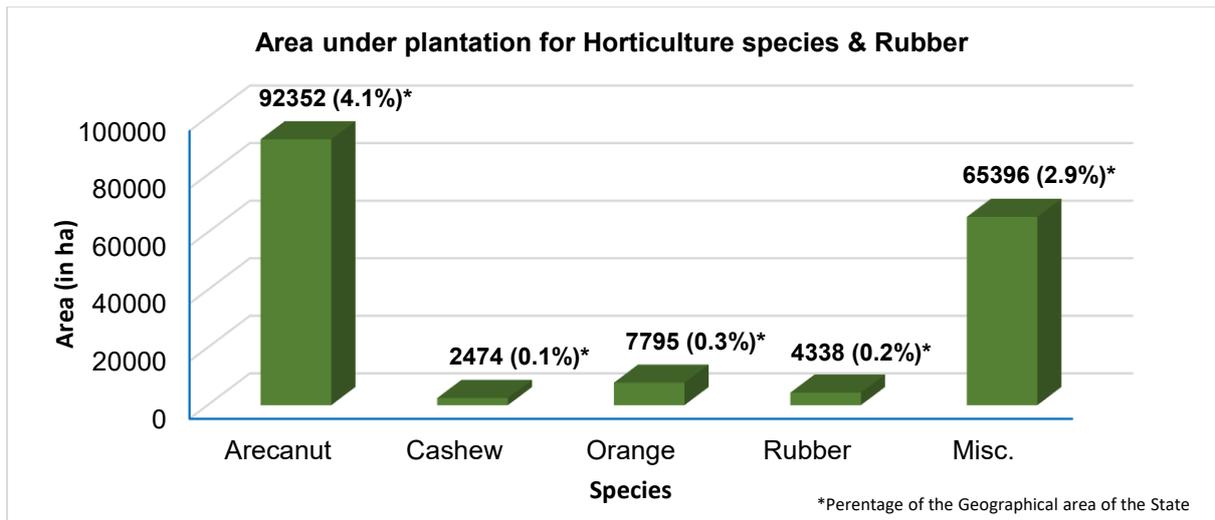
Fig. 5: Estimated area (ha) under plantation for horticulture species and Rubber in the State
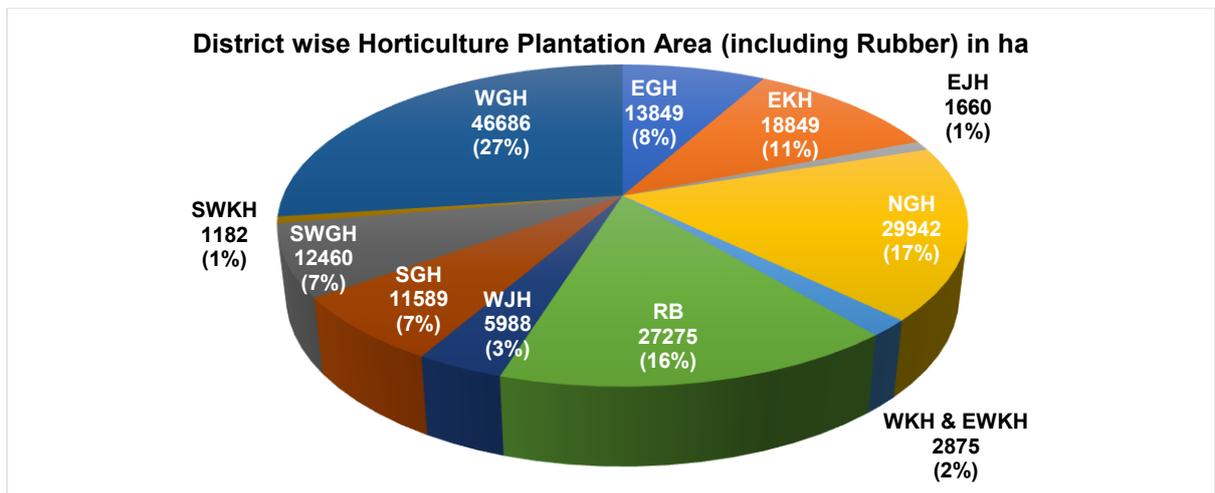
Fig. 6: District-wise area (ha) under horticulture plantation (including rubber)
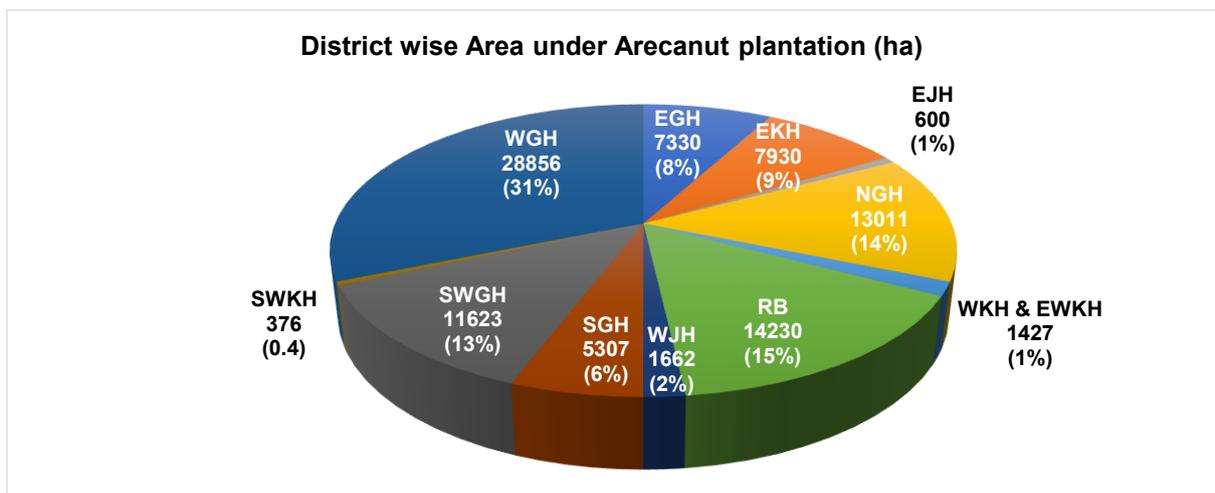
Fig. 7: District-wise area (ha) under arecanut plantation

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8. DISTRICT – WISE INVENTORY REPORT

8.1. EAST KHASI HILLS DISTRICT

8.1.1. District Profile

East Khasi Hills district is centrally located in Meghalaya and holds strategic importance as it includes Shillong, the state capital and district headquarters. The district is bounded by Ri-Bhoi district to the north, West Khasi Hills to the west, Jaintia Hills to the east, and the international boundary of Bangladesh to the south. Geographically, it forms part of the Shillong Plateau and is characterized by rugged hills, undulating uplands, steep escarpments, and deeply incised valleys. The district includes some of the highest elevations in the state, including Shillong Peak, which rises above the surrounding plateau and serves as an important landmark.

The district has a total forest cover of 1,47,533 ha, comprising 1,05,765 ha of open forest and 41,768 ha of dense forest. Plantations cover 18,849 ha (about 7% of the total geographical area). Arecanut and orange are the dominant plantation crops, alongside other fruit and commercial species such as banana, bay leaf, bayberry, betel leaf, chestnut, coconut, jackfruit, jujube, lemon, litchi, mango, peach, pear, citrus spp., wild berry, and broom.

8.1.2. Inventory Results

Table 3: Estimates of number of trees and area under plantation (ha) in East Khasi Hills

Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	7930	42	24075314	1.6 x 1.7
Orange	1431	8	572480	5 x 5
Misc.	9488	50	3454420	4.6 x 6
Total	**18849**	**100**	**28102214**	
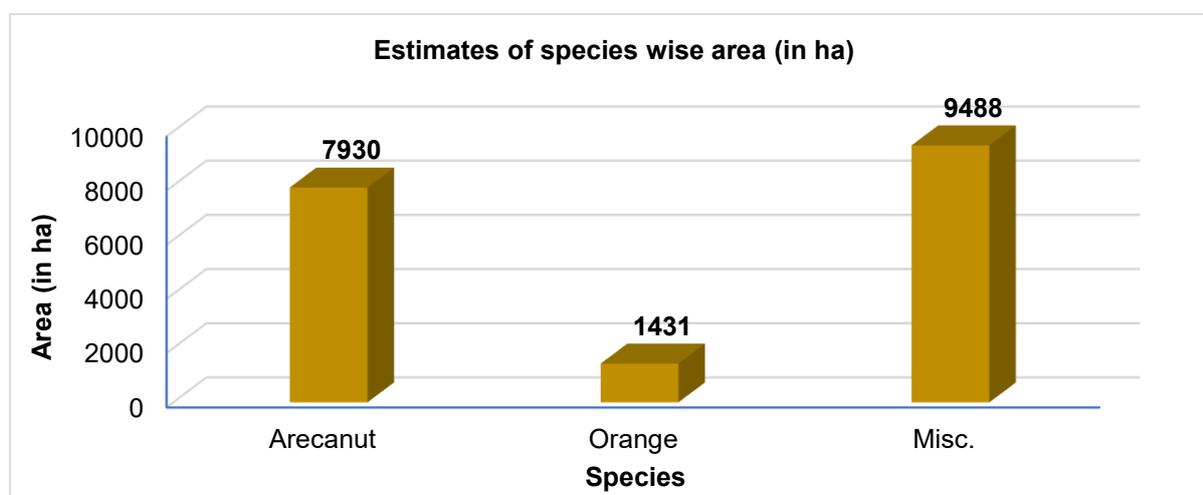
Fig. 8: Estimates of area under plantation in East Khasi Hills
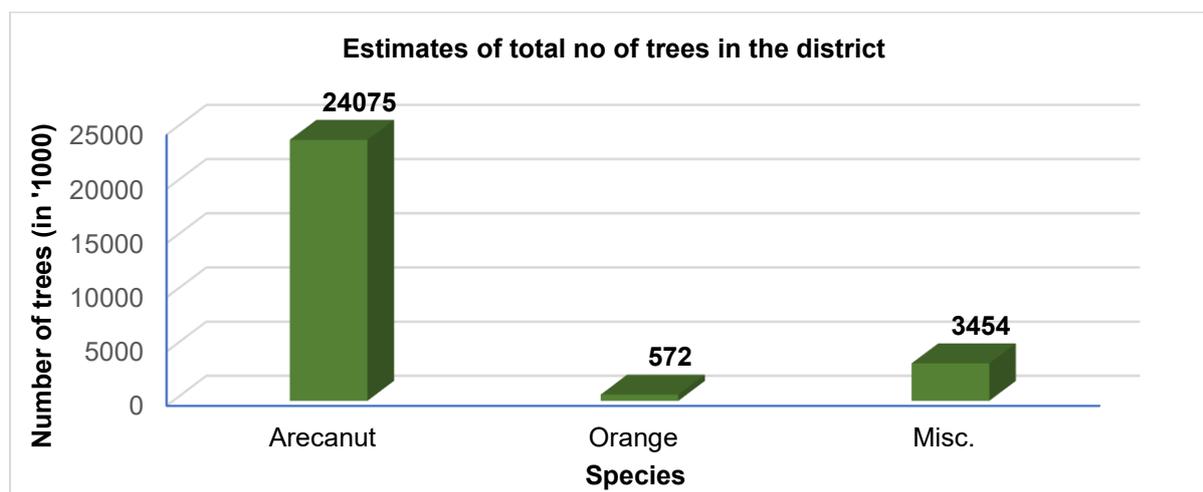
Fig. 9: Estimates of number of trees in East Khasi Hills

Table 4: Yield and sale proceeds from Arecanut Plantation in East Khasi Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	14.8
Average sale proceeds per ha (INR)	619627

8.2. WEST KHASI HILLS & EASTERN WEST KHASI HILLS DISTRICTS

8.2.1. District Profile

The district lies in the central part of the State of Meghalaya and is situated between approximately 25° 10′ and 25° 51′ N latitude, and between 90°44′ and 91°49′ E longitude. West Khasi Hills is situated in the western part of Meghalaya with a hilly terrain. It is bounded on the north-west by Kamrup district of Assam, on the north-east by Ri Bhoi district, on the east-by-East Khasi Hills district, on the south by Bangladesh and South West Khasi Hills district. The district comprises an area of about 3,906 sq.kms which is about 17% of the total area of the State. The elevation of the West Khasi Hills district varies across its terrain. The district comprises both low-lying areas and elevated regions due to its hilly topography. The region is predominantly rural, with agriculture serving as the primary occupation for many residents.

The total forest cover of both the districts is 2,57,539 ha out of which 1,85,832 ha accounts for open forest while 71,707 ha has dense forest. The total plantation area in the districts is 2,875 ha which accounts for about 1% of the total geographical area. Arecanut and orange constitute the principal plantation species in the region while a number of miscellaneous fruit species are also found including banana, guava, jackfruit, lemon, mango, peach, pear, *Prunus nepalensis*, starfruit, broom, etc.

8.2.2. Inventory Results

Table 5: Estimates of number of trees and area under plantation (ha) in West Khasi Hills & Eastern West Khasi Hills

Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	1427	50	3369375	2 x 2.1
Orange	208	7	144375	3.2 x 4.6
Misc.	1240	43	825939	3.9 x 3.9
Total	**2875**	**100**	**4339689**	

Fig. 10: Estimates of area under plantation in West Khasi Hills & Eastern West Khasi Hills

Fig. 11: Estimates of number of trees in West Khasi Hills & Eastern West Khasi Hills

Table 6: Yield and sale proceeds from Arecanut Plantation in West Khasi Hills & Eastern West Khasi Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	12.9
Average sale proceeds per ha (INR)	540058

8.3. SOUTH WEST KHASI HILLS

8.3.1.   District Profile

South West Khasi Hills District has a geographic area of 1341km² and is located between latitude 25.3106° N and longitude 91.2059° E. The District is composed of two Community & Rural Development Blocks viz. Ranikor Community & Rural Development Block and Mawkyrwat Community & Rural Development Block, including 18 (eighteen) villages under Warsan Lyngdoh Gram Sevak Circle of Nongstoin in Community & Rural Development Block. The district is bounded by West Khasi Hills District in the north, Bangladesh in the south, East Khasi Hills District in the east and West Khasi Hills and South Garo Hills District in the west.

The total forest cover in the district is 91,087 ha out of which 36,667 ha is Dense Forest, 54,420 ha is Open Forest Forest and 41,480 ha is Non-Forest.

The area covered under plantations is 1,182 ha which accounts for about 1% of the total geographical area of the district. The prevalent species in the plantations of the district are arecanut and orange. Several other horticultural species are also cultivated in the region, including bayberry, black pepper, jackfruit, lemon, litchi, Meghalayan cherry, silverberry, Himalayan lantern.

8.3.2. Inventory Result

Table 7: Estimates of number of trees and area under plantation (ha) in
South West Khasi Hills

Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	376	32	1119046	1.8 x 1.9
Orange	426	36	436826	3.6 x 2.7
Misc.	380	32	364632	3 x 3.4
Total	**1182**	**100**	**2297391**	

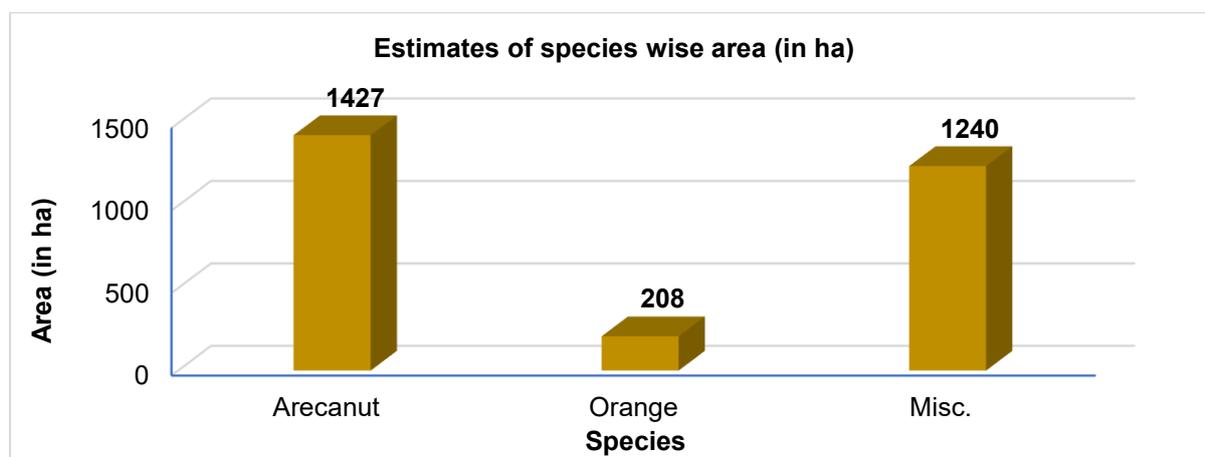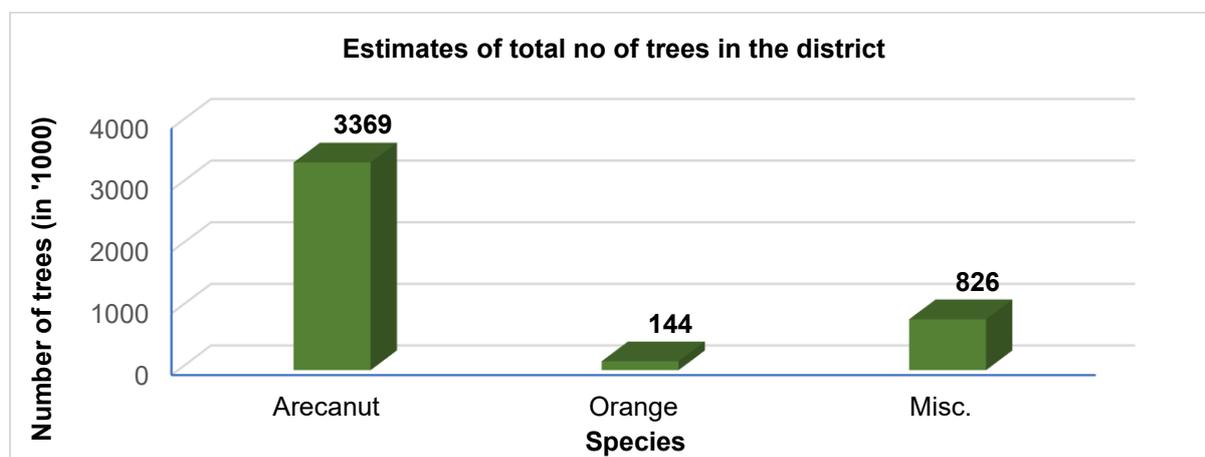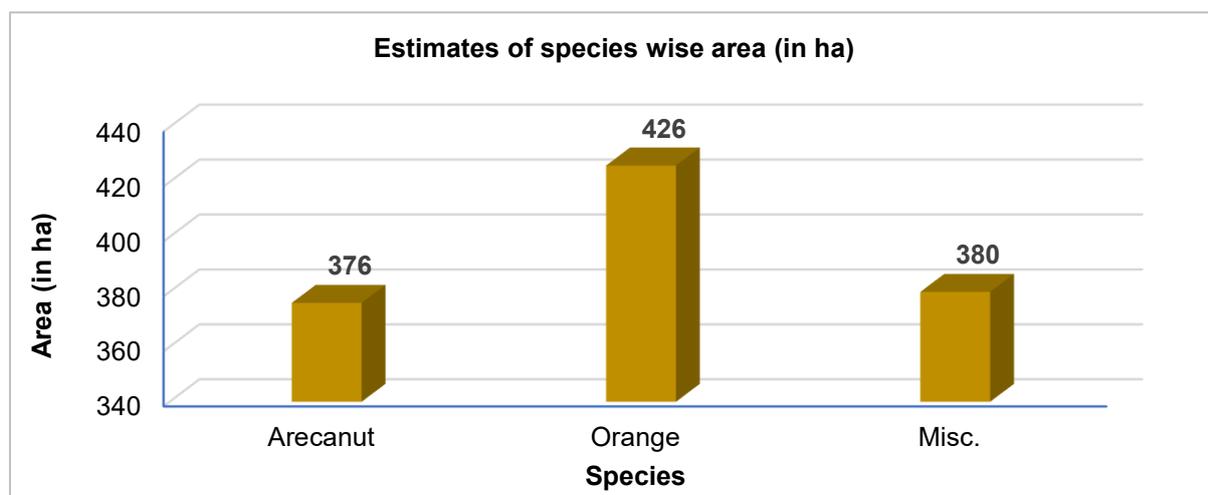Fig. 12: Estimates of area under plantation in South West Khasi Hills
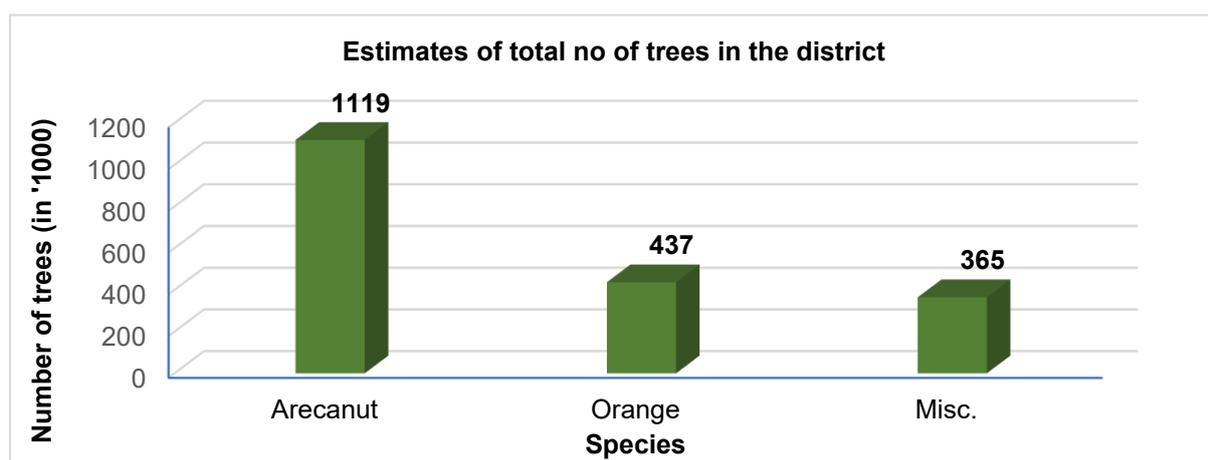
Fig. 13: Estimates of number of trees in South West Khasi Hills

Table 8: Yield and Sale proceeds from Arecanut Plantation in South West Khasi Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	11.9
Average sale proceeds per ha (INR)	500870

8.4. RI BHOI

8.4.1. District Profile

Ri-Bhoi District covers an area of 2,410.00 sq km and is located between longitudes 91°20'30" E and 92°17'00" E, and latitudes 25°40' N and 26°20' N." It is bounded in the north by the Kamrup district of Assam, east by the Karbi Anglong district of Assam, south by the East Khasi Hills and in the west by West Khasi Hills district. It has three Community and Rural Development blocks namely, Umling, Umsning and Jirang. The total forest cover is 1,79,838.62 ha which include dense and open forests of area 78055.49 ha and 101783.13 ha respectively.

Ri Bhoi district is characterized by a diverse biophysical profile and a predominantly rural, agrarian socio-economic structure. Agriculture serves as the primary livelihood for over 70% of the workforce, yet nearly 30% to 40% of households in certain rural blocks live below the poverty line. The total plantation area is more than 27,000 ha which accounts for about 11% of the total geographical area of the district and supports the cultivation of arecanut, orange and rubber. Horticulture crops that are also cultivated includes coffee, guava, jackfruit, litchi, mango, coconut, pomelo, papaya, tamarind, starfruit

8.4.2. Inventory Results

Table 9: Estimates of number of trees and area under plantation (ha) in Ri Bhoi

Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing meter)
Arecanut	14230	52	33707715	2 x 2
Orange	1284	5	1818333	2.4 x 2.9
Misc.	11761	43	16450275	3.7 x 1.9
Total	**27275**	**100**	**51976323**	
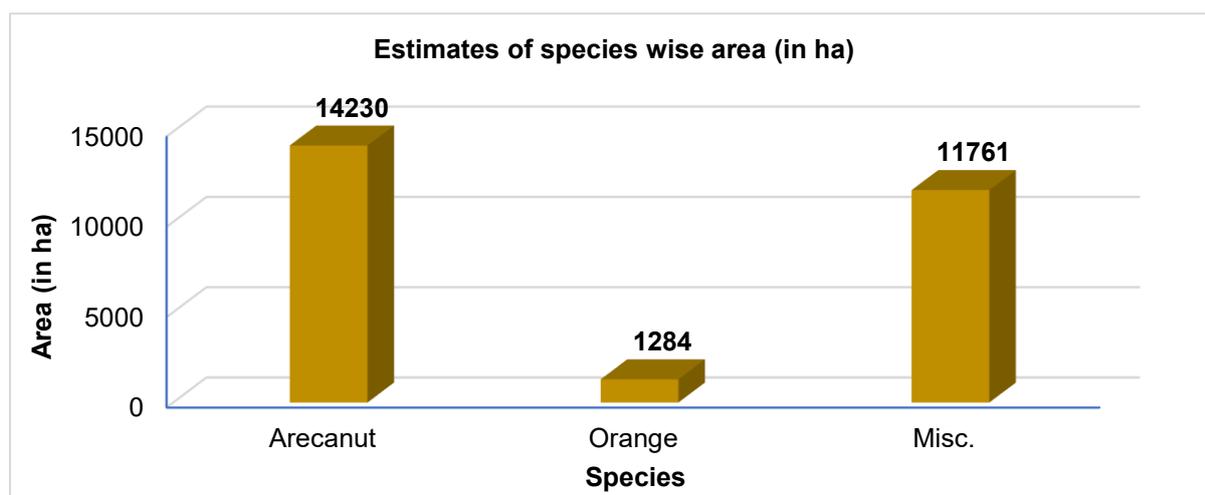
Fig. 15: Estimates of area under plantation in Ri Bhoi
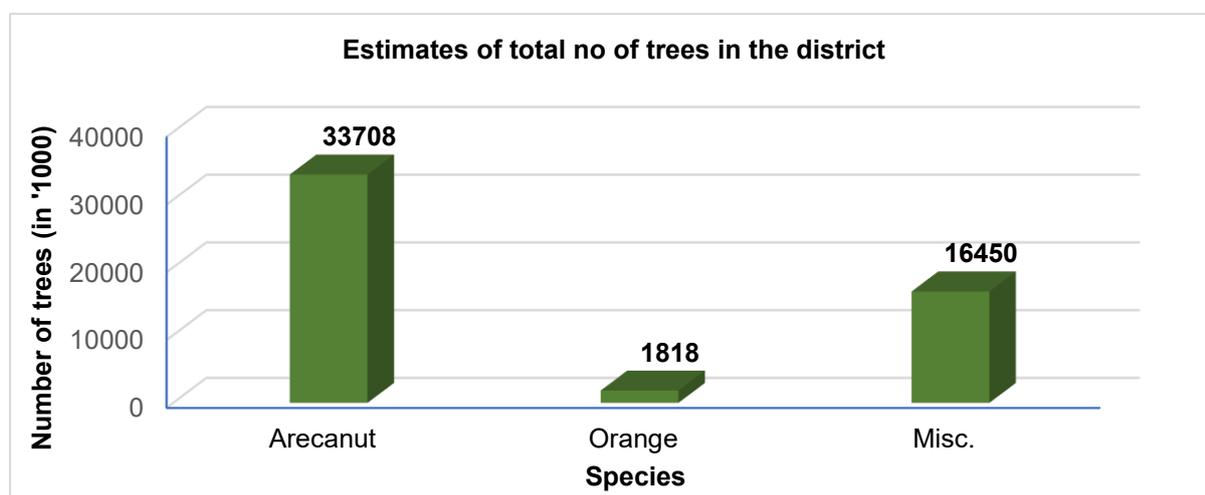
Fig. 14: Estimates of number of trees in Ri Bhoi

Table 10: Yield and sale proceeds from Arecanut Plantation in Ri Bhoi

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	14.8
Average sale proceeds per ha (INR)	622385

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8.5. EAST JAINTIA HILLS

8.5.1. District Profile

East Jaintia Hills District is located at the easternmost part of Meghalaya and covers an area of 2126sq. kms. It stands at an altitude of 1200 meters above sea level and is located between 25°.17 - 25°.22 latitude and 92°.15 - 92°.23 longitude. It is bounded by Bangladesh in the South, North Cachar Hills District in the East and West Jaintia Hills District in the North and West. The District is known for its extensive cave systems and unique karst landscape that are formed out of limestone and contribute to the distinct topography of the region. Overall, the topography of East Jaintia Hills is characterized by its rugged terrain, abundant greenery, water bodies, and unique geological features. The total forest cover of the District is 1,81,044 ha with 1,40,421 ha as open forests and 40,623 ha being dense forests. There are several Reserved Forests in the District namely Saipung Reserved Forest, Narpuh Reserved Forest Block I and Narpuh Reserved Forest Block II.

The population primarily relies on agriculture, forest resources, and mining for its livelihood. The total area under plantations is approximately 1,660 hectares, accounting for nearly 1% of the district's total geographical area. Arecanut and orange are the predominant plantation crops cultivated in the region. In addition, other species such as *Citrus* spp., silverberry, and broom are also grown.

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8.5.2. Inventory Results

Table 11: Estimates of number of trees and area under plantation (ha) in East Jaintia Hills

Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	600	36	1421375	1.8 x 2.3
Cashew	72	4	84297	2.8 x 3.1
Orange	368	22	272344	3.7 x 3.6
Misc.	620	37	2627895	2.9 x 3.7
Total	**1660**	**100**	**4405911**	

Estimates from the Horticulture Resource Inventory

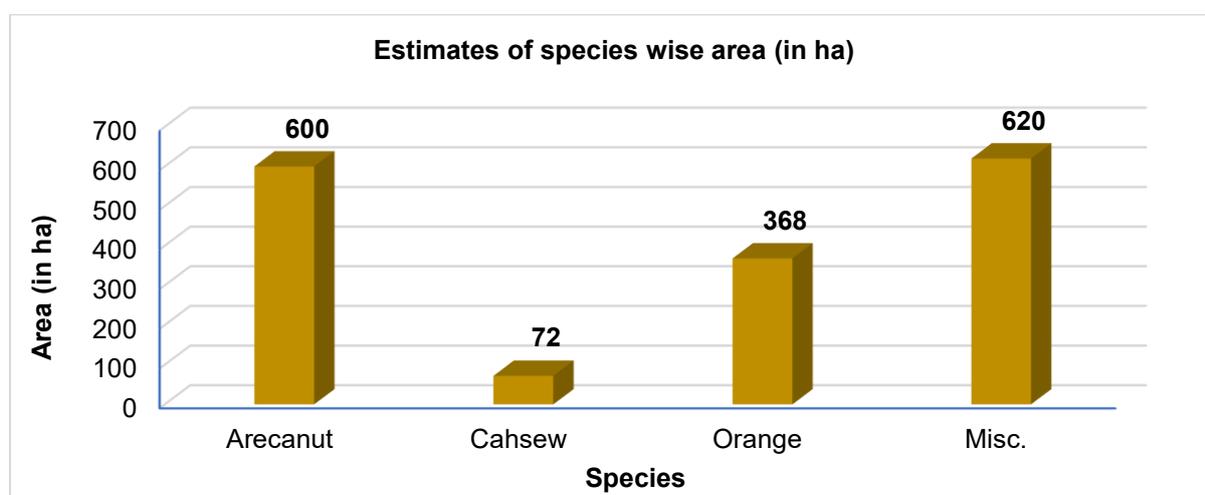Fig. 16: Estimates of area under plantation in East Jaintia Hills

Fig. 17: Estimates of number of trees in East Jaintia Hills

Table 12: Yield and sale proceeds from Arecanut Plantation in East Jaintia Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	14.2
Average sale proceeds per ha (INR)	597396

8.6. WEST JAINTIA HILLS

8.6.1. District Profile

West Jaintia Hills District is located in the central part of the Jaintia Hills region of Meghalaya and was carved out as a separate district in 2012. The district shares its boundaries with East Jaintia Hills District to the east, East Khasi Hills District to the west, and Assam to the north. The altitude varies considerably, resulting in diverse micro-climatic conditions suitable for a range of agricultural and horticultural crops. West Jaintia Hills is predominantly rural, with a strong dependence on agriculture, horticulture, and forest-based livelihoods. The district follows a traditional landholding system, where community ownership and clan-based management are common, influencing land use and plantation practices.

Forest cover in the district extends over an area of 1,18,836 ha that includes community forests, clan forests, and reserved forests. Open forests accounts for ha 93,459 ha and dense forest spans and area of 25,377 ha. Livelihoods are closely linked to natural resources, and seasonal migration for labour is limited compared to other regions. Total plantation area includes an area of 5,988 ha which makes up 4% of the total geographical area of the district. The main plantation crops are arecanut and orange while miscellaneous fruit species such as guava, jackfruit, lemon, peach and pear are also cultivated.

8.6.2. Inventory Results

Table 13: Estimates of number of trees and area under plantation (ha) in West Jaintia Hills

Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	1662	28	6631915	1.5 x 1.6
Orange	196	3	498316	1.7 x 2.3
Misc.	4130	69	7483036	2.4 x 2.3
Total	**5988**	**100**	**14613267**	

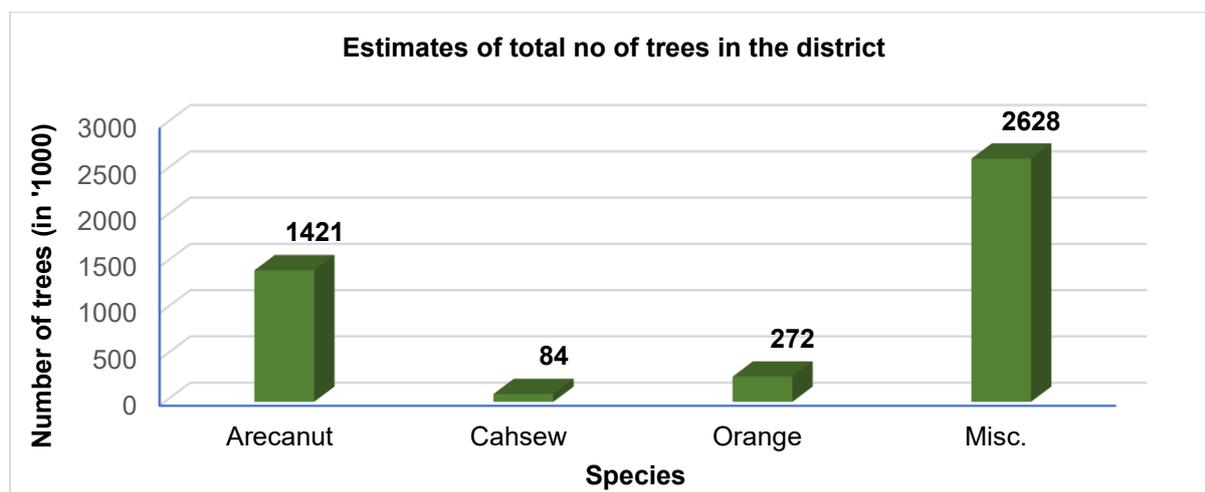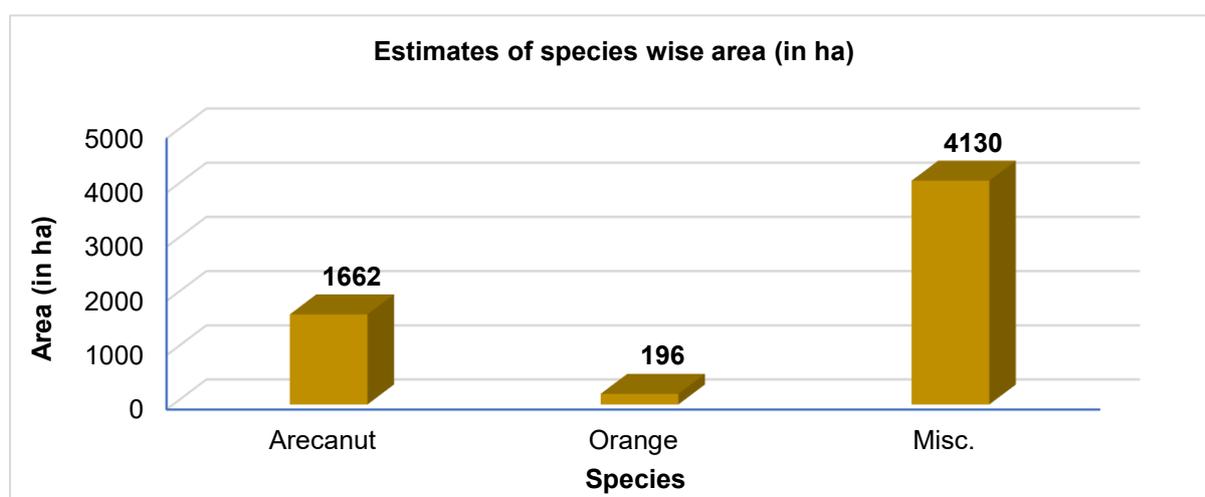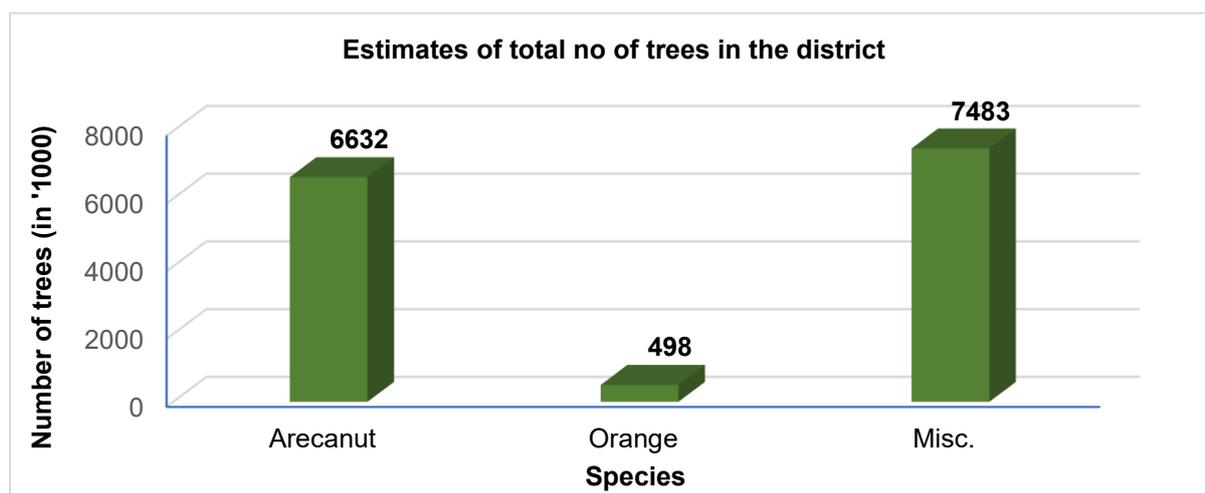Fig. 18: Estimates of area under plantation in West Jaintia Hills

Fig. 19: Estimates of number of trees in West Jaintia Hills

Table 14: Yield and sale proceeds from Arecanut Plantation in West Jaintia Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	14.6
Average sale proceeds per ha (INR)	614564

8.7. EAST GARO HILLS

8.7.1. District Profile

East Garo Hills District is situated between 250 24′ 45″ to 260 01′ 00″ N latitude and 900 07′ 00″ to 910 02′ 00″ E. The district is bounded by South Garo Hills on the south, West Garo Hills on the west, West Khasi Hills on the east and North Garo Hills on the north. The district headquarter is located at Williamnagar. The geographical area of the District covers to a total of 1,48,999 ha. The District is characterized by hilly terrain, forming part of the Garo-Khasi range. The topography of the rest of the district is of undulating low hills, with altitude ranging from 150 to 600 metres above sea level.

The total forest cover of the District is 1,08,056 ha which is 72.6% of the geographical area of the district. Open and dense forest accounts for 93,668 ha and 14,388 ha respectively. There are several Reserved Forest in the District viz. Songsak Reserved Forest, Rongrengre Reserved Forest and Darugre Reserved Forest.

More than 13,000 ha (9% of the total geographical area of the distric) extends over plantations of arecanut, cashew, orange, rubber. Other species that are cultivated included banana, burmese grape, coconut, gooseberry, guava, jackfruit, jasamgre, lemon, litchi, mango, papaya, pear, pepper, pineapple, plum, pomegranate, pomelo, star fruit, tamarind, etc.

8.7.2. Inventory Results

Table 15: Estimates of number of trees and area under plantation (ha) in East Garo Hills

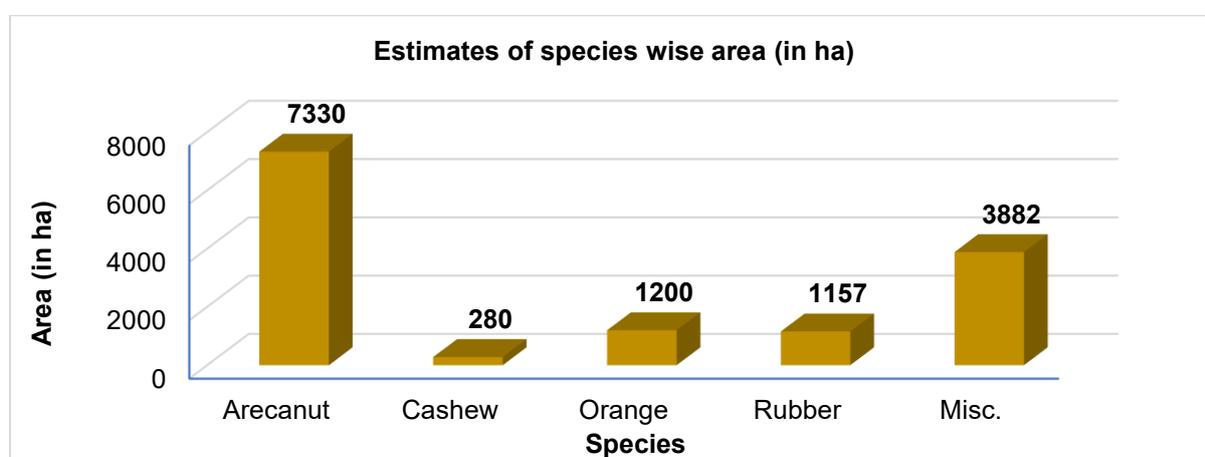| Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing meter)
Arecanut	7330	53	19021645	1.8 x 1.8
Cashew	280	2	104758	4.9 x 5.5
Orange	1200	9	1008522	4.2 x 5.2
Rubber	1157	8	552201	4 x 5.2
Misc.	3882	28	2207790	3.6 x 4.8
Total	13849	100	22894916	

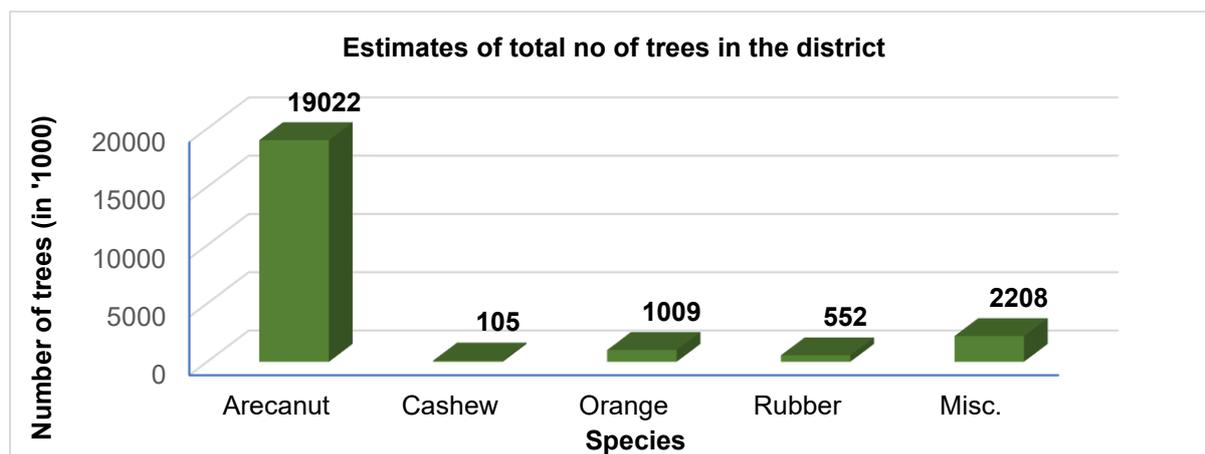Fig. 20: Estimates of area under plantation in East Garo Hills

Fig. 21: Estimates of number of trees in East Garo Hills

Table 16: Yield and sale proceeds from Arecanut Plantation in East Garo Hills

Yield and sale proceeds per hectare from arecanut plantation	
Average yield per ha (tonnes)	14.7
Average sale proceeds per ha (INR)	514470

8.8. WEST GARO HILLS

8.8.1. District Profile

West Garo Hills is one of the largest districts of Meghalaya located in the western part of the State. The district is situated between 25° 34' 5" N latitude and 90° 13' 28" E. The geographical area covers to a total of 2,89,300 ha West Garo Hills District is mostly hilly with plains fringing the northern, western and the south-western borders. West Garo Hills District has a forest cover of 1,84,312 ha with open forest that spans an area of 1,77,953 and dense forest extending over an area of 6,359 ha. The total forest cover of the district is accounts for 50% of the geographical area of the district. Several mineral resources are also found this district like Coal, Limestone, Phosphorus, Gypsum and Glass sand. The District of West Garo Hills comprises of 8 (eight) Community and Rural Development (C&RD) Blocks namely Rongram, Dadengre, Dalu, Selsella, Tirikilla, Gambegre, Demdema and Batabari C&RD Blocks.

Agriculture is the major economic activity of the district with 70 % of the population engaged in agriculture. Other predominant economic activities in the district are horticulture plantation, rubber plantation and livestock activities. Area under plantation in the district is about 13% of the total geographical area (46,686 ha) and supports the cultivation of arecanut, cashew, orange, rubber. Other horticulture species that are also cultivated include Burmese grape, guava, jackfruit, lemon, litchi, mango, pear and pomelo.

8.8.2. Inventory Results

Table 17: Estimates of number of trees and area under plantation (ha) in West Garo Hills

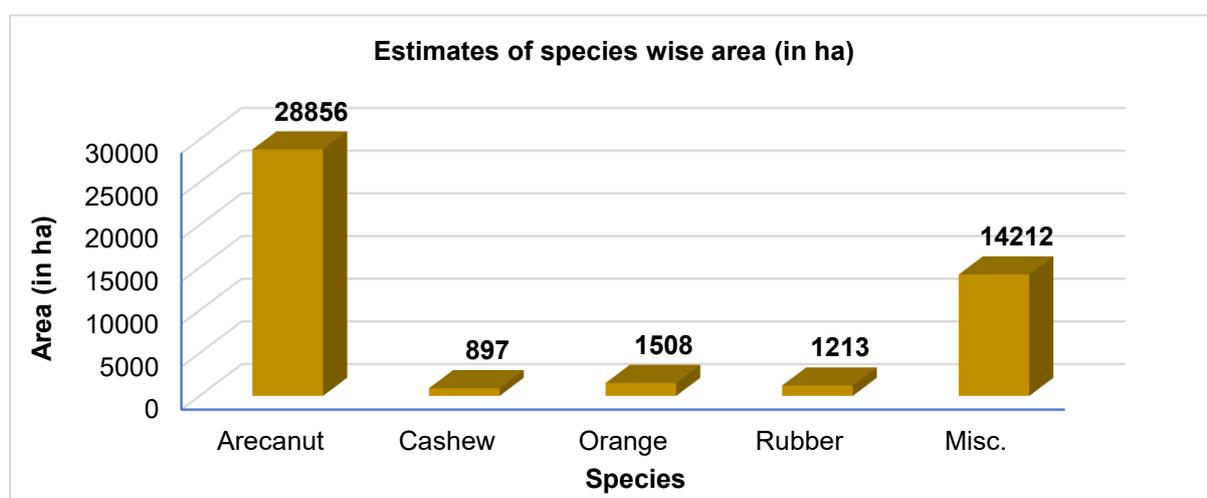| Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	28856	62	68865861	2.1 x 2
Cashew	897	2	1167150	2.7 x 2.9
Orange	1508	3	717938	6 x 3.5
Rubber	1213	3	802165	3.6 x 4.2
Misc.	14212	30	13555403	3.4 x 3.1
Total	**46686**	**100**	**85108517**	

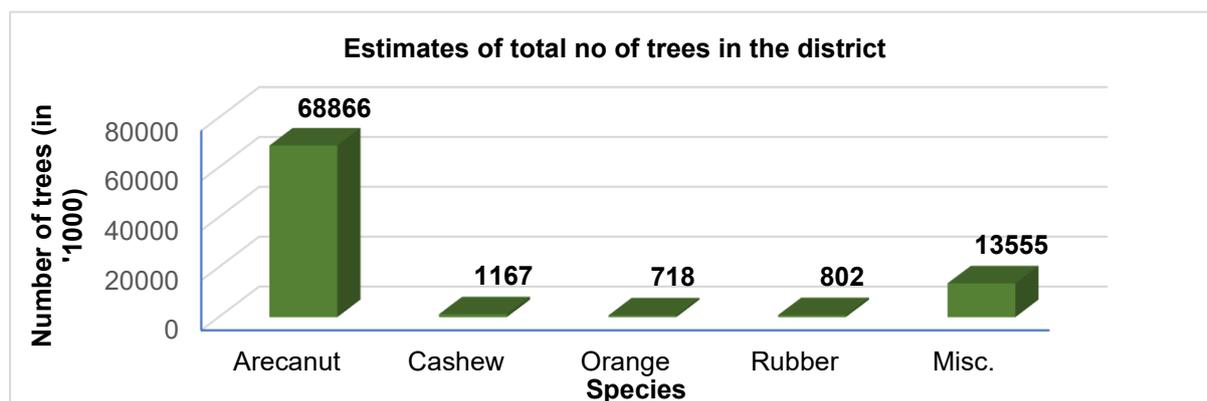Fig. 22: Estimates of area under plantation in West Garo Hills

Fig. 23: Estimates of number of trees in West Garo Hills

Table 18: Yield and sale proceeds from Arecanut Plantation in West Garo Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	12.2
Average sale proceeds per ha (INR)	427730

8.9. NORTH GARO HILLS

8.9.1. District Profile

North Garo Hills occupies the northernmost part of the Garo Hills and serves as a gateway to the region, sharing borders with the neighbouring state of Assam. The district's terrain is largely hilly and forested, typical of the larger Garo Hills region known for lush landscapes and high rainfall. Total forest cover is 79460 ha that include 62072 ha of open forest and 17388 ha of dense forest.

Connectivity supports agriculture and trade but can still be challenging during monsoon seasons due to terrain and rainfall. The economy is predominantly agrarian with roughly 90% of the population dependent on agriculture. The total plantation area covers 29,942 hectares, accounting for approximately 26% of the district's total geographical area.

The predominant species that are cultivated include arecanut, cashew, orange and rubber while miscellaneous species such as apple, banana, black pepper, coconut, grapes, guava, jackfruit, litchi, mango, papaya, pepper, pineapple, plum are also cultivated.

8.9.2. Inventory Results

Table 19: Estimates of number of trees and area under plantation (ha) in North Garo Hills

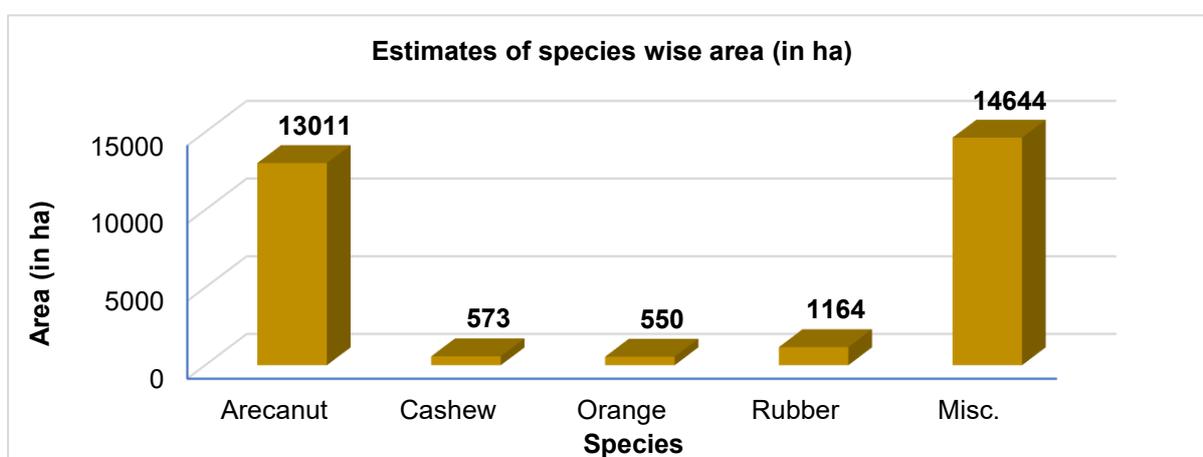| Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	13011	43	29037300	2.1 x 2.1
Cashew	573	2	365090	4 x 3.9
Orange	550	2	247986	4.3 x 5.1
Rubber	1164	4	780696	3.5 x 4.2
Misc.	14644	49	10964462	3 x 4.4
Total	**29942**	**100**	**41395534**	

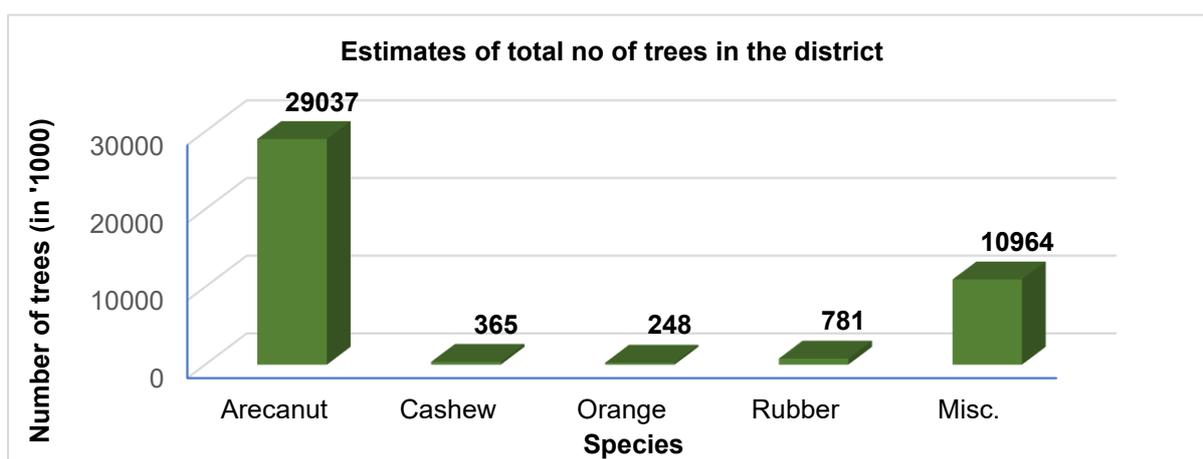Fig. 24: Estimates of area under plantation in North Garo Hills

Fig. 25: Estimates of number of trees in North Garo Hills

Table 20: Yield and sale proceeds from Arecanut Plantation in North Garo Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (tonnes)	15.0
Average sale proceeds per ha (INR)	524644

8.10. SOUTH GARO HILLS

8.10.1. District Profile

South Garo Hills district is situated between 25º10' and 25º35'N latitudes and 90º15 and 91º0' E longitude. It covers an area of 1,887sq. Km and is bounded in the north by East Garo Hills, in the East by the West Khasi Hills District, in the West by the West Garo Hills district and in the South by Bangladesh. The district has dense tropical mixed forests and is part of the Indo-Burma Biodiversity Hotspot. It is home to Balpakram National Park and the Siju Bird Sanctuary. The total forest cover of the district is 1,67,358 ha which is 88% of the geographical area of the district. Open and dense forests accounts for 1,44,193 ha and 23,165 ha respectively.

South Garo Hills district is characterized by hilly, undulating plateau terrain, rich biodiversity, and notable mineral resources, with a predominantly rural population reliant on agriculture. Plantations cover approximately 11,589 hectares, accounting for about 6 percent of the district's total geographical area. Major crops include arecanut, cashew, orange, and rubber, along with other species such as banana, betel leaf, black pepper, cocoa, coffee, gooseberry, jackfruit, lemon, litchi, mango, papaya, pineapple, pomelo, and tamarind

8.10.2. Inventory Results

Table 21: Estimates of number of trees and area under plantation (ha) in South Garo Hills

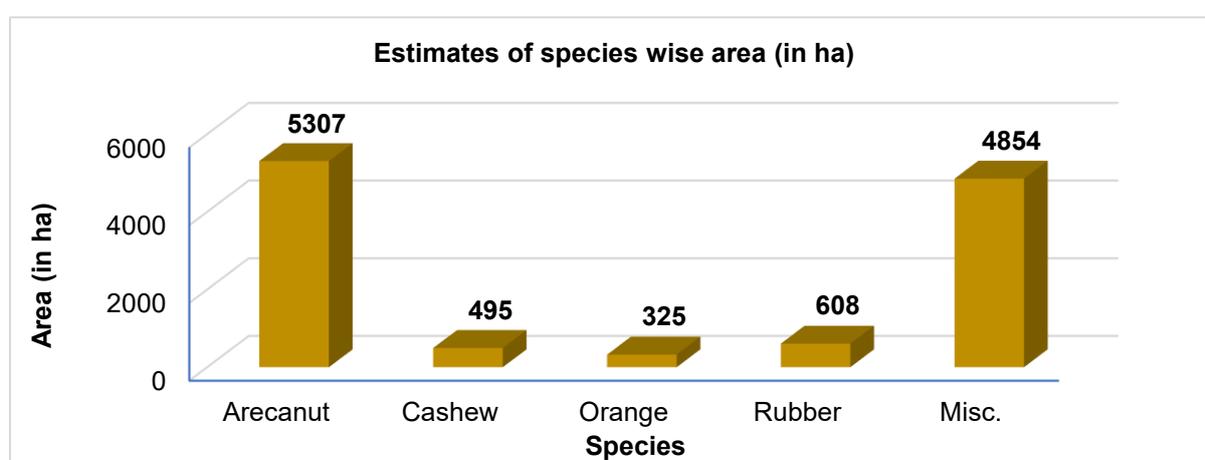| Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	5307	46	13916196	1.9 x 2
Cashew	495	4	1127578	2 x 2.2
Orange	325	3	632697	2.3 x 2.2
Rubber	608	5	350802	3.4 x 5.2
Misc.	4854	42	2456070	4 x 4.9
Total	**11589**	**100**	**18483343**	

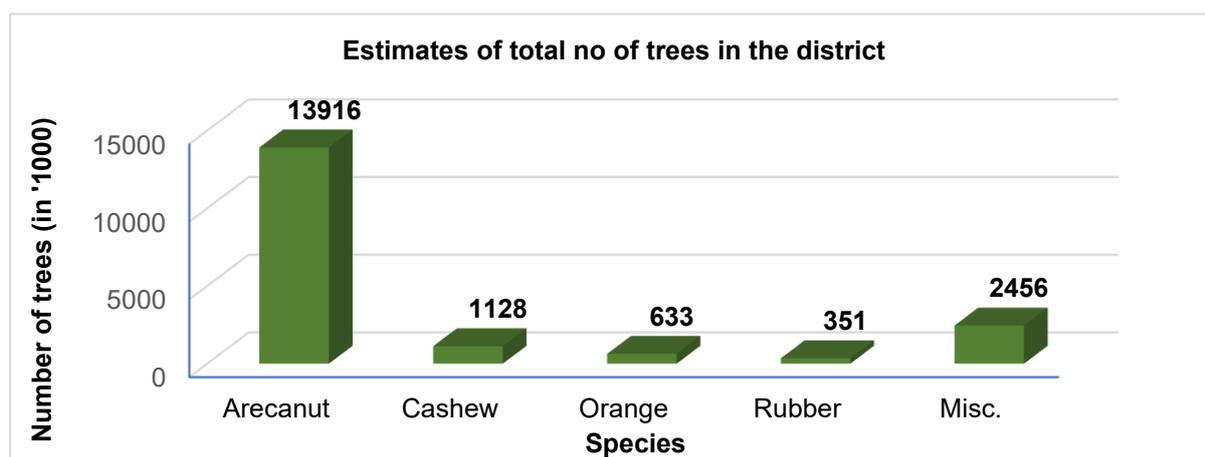Fig. 26: Estimates of area under plantation in South Garo Hills

Fig. 27: Estimates of number of trees in South Garo Hills

Table 22: Yield and sale proceeds from Arecanut Plantation in South Garo Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (in tonnes)	15.8
Average sale proceeds per ha (in INR)	554094

8.11. SOUTH WEST GARO HILLS

8.11.1. District Profile

South-West Garo Hills district is situated between 25° 28' 21" N latitude and 89° 56' 2"
E and covers a geographical area of 86,600 ha. The district is bounded by Assam and
West Garo Hills District on the North, Bangladesh on the South, West Garo Hills District
on the East, and Assam and Bangladesh on the West. Nearly one third of the total area
is covered with hills, while the rest is a plain region scattered with small hillocks. The
district of South West Garo Hills comprises of 4 (three) Community and Rural
Development (C&RD) Blocks namely Betasing, Rerapara, Zikzak and Purakhasia
C&RD Blocks. The total forest cover of the district is 48,502 ha which accounts for 59%
of the total geographical area. The area under open and dense forest covers an area
of 39,056 ha and 9,446 ha respectively. There are several Reserved Forest in the
District viz. Songsak Reserved Forest, Rongrengre Reserved Forest and Darugre
Reserved Forest.

The area under plantation activities is 12,460 ha (14% of the total geographical area)
that supports the cultivation of arecanut, cashew, orange and rubber. Other that are
also cultivated include Burmese grape, guava, jackfruit, lemon, litchi, mango, pear and
pomelo.

8.11.2. Inventory Results

Table 23: Estimates of number of trees and area under plantation (ha) in
South West Garo Hills

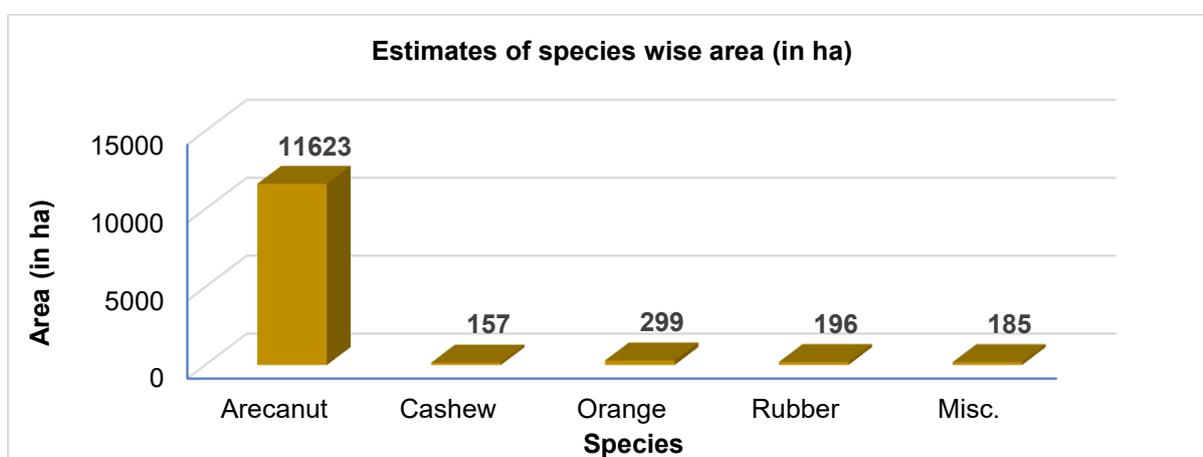| Estimates from the Horticulture Resource Inventory				
Species	Estimate of species wise area (ha)	Percent (%)	Estimate of total no of trees in the district	Average spacing (meter)
Arecanut	11623	93	28060958	2 x 2
Cashew	157	1	81769	4.5 x 4.2
Orange	299	2	288138	3.4 x 3
Rubber	196	2	99940	5 x 3.9
Misc.	185	1	92144	3.4 x 5.9
Total	**12460**	**100**	**28622949**	

Fig. 28: Estimates of area under plantation in South West Garo Hills

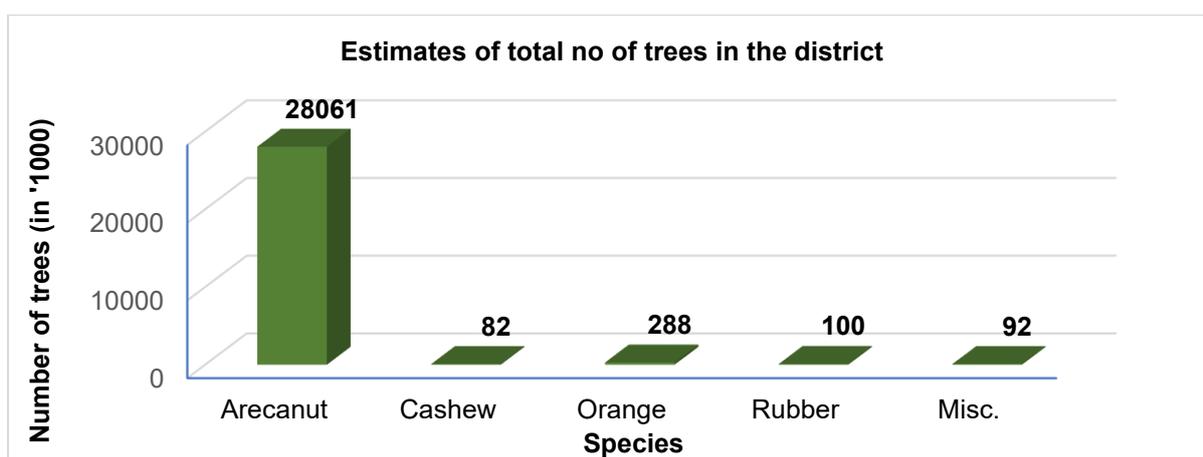Fig. 29: Estimates of number of trees in South West Garo Hills

Table 24: Yield and sale proceeds from Arecanut Plantation in South West Garo Hills

Yield and sale proceeds from arecanut plantation	
Average yield per ha (in tonnes)	9.9
Average sale proceeds per ha (in INR)	347121

9. LIMITATIONS OF THE ASSESSMENT

East Khasi Hills

- Poor roads and network connectivity affecting travel and GPS tracking.
- Long distances between scattered plots; limited daily coverage.
- Restricted access to private/forest lands and absence of landowners.
- Delayed payments to VCFs affecting motivation.
- Difficulty in explaining survey objectives to village authorities.

West Khasi Hills & Eastern West Khasi Hills

- Poor road conditions.
- Long distances and difficult terrain; some sample points lost due to network issues.
- Restricted entry without permission from local authorities (Rangbah Shnong).
- Limited access to forest areas.
- Incomplete yield data in absence of landowners.

South West Khasi Hills

- Poor network connectivity causing GPS errors and data delays.
- Restricted access to forest areas.
- Large distances between plots and difficult terrain affecting efficiency.

Ri Bhoi

- Poor network connectivity affecting GPS accuracy and data recording.
- Restricted forest access limiting data collection.
- Widely dispersed plots and challenging terrain affecting coverage.

East Jaintia & West Jaintia Hills

- Difficult terrain and limited accessibility.
- Minor variations in field measurements and species identification.
- Seasonal changes, recent harvesting, and new plantations not captured.
- Productivity and income estimates based on limited observations.
- Satellite data inaccuracies, terrain challenges, reliance on farmer inputs, and limited productivity estimates.

East Garo Hills

- Yield variations across farms and regions.
- Poor road conditions.
- Pest and disease damage not always visible.

-

West Garo Hills

● Limited cooperation from some villagers due to land ownership concerns.

● Scattered plots requiring extensive travel.

● Physical and time pressures on VCFs affecting efficiency.

North Garo Hills

● Weather variability and yield fluctuations.

● Poor road conditions.

● Pest/ disease damage not fully visible.

South Garo Hills

● Poor roads and network connectivity affecting GPS tracking.

● Scattered and inaccessible plots.

● Restricted access to private lands and absentee landowners.

● Safety risks during travel and monsoon challenges.

● Delayed payments to VCFs and communication challenges with village authorities.

South West Garo Hills

● Limited community cooperation due to land-related concerns.

● Scattered plots and long travel distances.

● Time and physical constraints affecting timely implementation.

10. CONCLUSION

The State-Wide Inventory of Arecanut & Other Horticulture Tree Plantations report presents the results of the first ever exercise of this nature and scale for the State. The exercise is based on a scientific methodology involving data from over 2900 sample plots. The findings offer a reliable baseline for evidence-based planning, policy formulation, and targeted interventions aimed at enhancing productivity and sustainability. By systematically documenting the spatial extent, density, and species composition of plantations, the study provides actionable insights for improving crop management practices and strengthening market linkages.

Arecanut, along with diverse horticultural species such as orange, lemon, jackfruit, bayberry, black pepper, litchi, and other regionally important fruit trees, forms the backbone of plantation-based horticultural systems in the State. These species not only provide a steady source of household income but also contribute significantly to nutritional security, employment generation, and value-chain development. However, no scientific assessment about the horticulture resource of the State in terms of species-wise extent and estimates of number of trees was available before this exercise. The results of this assessment therefore serve not only as a statistical account of plantation resources for harnessing their full potential.

The assessment was faced with constrains that were logistical, technical, environmental, poor roads and network connectivity, difficult terrain, scattered and inaccessible plots, etc. However, care has been taken to overcome the limitations posed by these conditions by data refinement and procession methods.

In conclusion, the comprehensive inventory establishes a strong foundation for advancing Meghalaya's horticulture plantation sector through informed decision-making, improved resource management, and sustainable growth. It underscores the immense utility of arecanut and horticulture tree species as instruments of economic resilience, environmental stewardship, and long-term rural prosperity in the State.

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