GOVERNMENT OF MEGHALAYA
DEPARTMENT OF FORESTS AND ENVIRONMENT
OFFICE OF
THE PRINCIPAL CHIEF CONSERVATOR OF FOREST
WORKING PLAN, RESEARCH & TRAINING AND DISTRICT COUNCIL AFFAIRS
MEGHALAYA, SHILLONG

No. MFRT/G/280 | 1275 Dated Shillong, the 21st August 2024

Notice Inviting Comments and Suggestions

This Office with financial assistance from the Meghalaya Basin Development Authority (MBDA) is implementing a project titled '**Establishment of a Supply Chain to Ensure Assured Supply of Seeds and Other Plant Propagules of Superior Genetic Makeup'.** A copy of the project document containing details of various activities to be undertaken under the project including a list of 50 species tentatively prioritised for development of the supply chain in the first phase, is enclosed.

All interested stakeholders may provide their comments and suggestions and may suggest appropriate amendment(s), if any in the activities proposed to be undertaken under the project and 50 species tentatively prioritised for development of the supply chain in the first phase, through email at pccfmeghccrandt@gmail.com, on or before 23.55 Hrs. on 22nd September 2024.

Encl.: As above.

21/08/24

(H.C. Chaudhary, IFS)
Principal Chief Conservator of Forests
Working Plan Research & Training and District Council Affairs
Meghalaya: Shillong
Email: pccfmeghccrandt@gmail.com Ph:91-364-2227311

Government of Meghalaya
Forest and Environment Department

Proposal for

Establishment of A Supply Chain

for

Assured Supply of Seeds

and

Other Plant Propagules

of

Superior Genetic Makeup

Prepared By:

H.C. Chaudhary, IFS
Principal Chief Conservator of Forests
Working Plan, Research & Training and District Council Affairs

CONTENTS

		Page No.
1	BACKGROUND	1
2	PROPOSAL	1
2.1	Project Components	1
2.2	Details of activities to be undertaken under each project component	2
2.2.1	Prioritization of Species	2
2.2.2	Establishment of Sources of Seeds and Other Plant Propagules of Superior Genetic Makeup	4
2.2.2.1	Establishment of In-Situ Seed Production Areas and Seed Stands	5
2.2.2.2	Establishment of Ex-Situ Sources of Seeds and Other Plant Propagules of Superior Genetic Makeup	5
2.2.2.2.1	Obtaining/Procuring License to Utilize Seeds and other Propagules of Certified Clones and Plus Trees of Prioritised Species	6
2.2.2.2.2	Establishment of Seedling Seed Orchards	6
2.2.2.2.3	Establishment of Clonal Seed Orchards	6
2.2.2.2.4	Establishment of Vegetative Multiplication Gardens	6
2.2.2.2.5	Identification of Candidates Plus Trees and Heritage/Old Growth Trees	7
2.2.2.2.6	Establishment of Seedling Seed Orchards cum Progeny Trials	7
2.2.2.2.7	Establishment of Clonal Orchards cum Progeny Trials	8
2.2.3	Standardization of Collection, Extraction, Drying and Pre-Storage Treatment	8
2.2.4	Establishment of Seed Storage and Testing Facilities	9
2.2.4.1	Long Term Storage for Bio-Preservation	9

2.2.4.2	Medium Term Storage	10
2.2.4.3	Working Storage	10
2.2.4.4	Seed Testing Facilities	10
2.2.5	Establishment of Facilities for Timely Collection, Extraction, Processing, Testing and Sowing of Seeds of Recalcitrant Species	12
2.2.5	Capacity Building of Persons Involved in Seed Collection, Extraction, Drying, Pre- Storage treatment, Storage and Testing	13
2.2.5.1	Publication of Seed Manual	13
2.2.5.2	Publication of handbooks	13
2.2.5.3	Preparation of Informative Video	13
2.2.5.4	Publication of Posters and Leaflets and Other IEC Materials	14
2.2.5.5	Organization of Trainings	14
3	PROJECT DURATION	14
4	ESTIMATED OUTLAY	14
5.	IMPLEMENTATION MECHANISM	15

ANNEXURES

Annexure-I	Map of 32 hectare land transferred in favour of the Forest and Environment Department at Daruggre for raising compensatory afforestation in lieu of 31.558 hectare deemed forest land diverted in favour of NangalbibraBongaigaon Transmission line for construction of 400 KV DCNagalbibraBongaigaon Transmission Line proposed to be utilised for establishment of *ex-situ* seed source	(i)
Annexure-II	Map of 10 hectare land located within the Rongrenggre Reserve Forest proposed to be utilised for establishment of *ex-situ* seed source	(ii)

Annexure-III	Map of 5 hectare land located within the Rongrenggre Reserve Forest proposed to be utilised for establishment of *ex-situ* seed source	(iii)
Annexure-IV	Map of 3 hectare land located at Experimental Plot of Silviculture Division located at Lumsohpatblang proposed to be utilised for establishment of *ex-situ* seed source	(iv)
Annexure-V	Map of 7 hectares land owned by Jaintia Hills Autonomous District Council located at Minkjai Village, West Jaintia Hills District proposed to be utilised for establishment of *ex-situ* seed source	(v)
Annexure-VI	Map of 3 hectares land owned by Jaintia Hills Autonomous District Council located at Jarain Village, East Jaintia Hills District proposed to be utilised for establishment of *ex-situ* seed source	(vi)
Annexure-VII	Detailed specification of Medium Term Seed Storage Facility proposed to be established at Upper Shillong	(vii)
Annexure-VIII	Detailed estimates for establishment of supply chain for assured supply of seeds and other plant propagules of superior genetic make up	(xv)
Annexure-IX	A copy to Notification No. LBG.9/2023/ 5 dated 31.03.2023 issued by the Labour Department, Government of Meghalaya to revise the minimum wage for unskilled labourer*w.e.f.* 01.04.2023.	(xxvi)

1. BACKGROUND

1.1 Every year a large sum is spent by Forest and Environment Department and various other Departments and Agencies in Meghalaya on plantation of forestry species. Availability of good quality seeds of diverse species and provenances is the first and the most important requirement for success of plantations and other afforestation works.State however, presently does not have a mechanism to ensure assured supply of good quality seeds of forestry species suitable for climatic and edaphic conditions of the State.

1.2 Seeds required for afforestation works in the State areprocuredfrom non-verified sources. Quality oftheseeds is neither tested nor certified by any agency. Many a time, required number of plants ofspeciesidentified for afforestation workscannot be raised in nurseries due to non-availability of seeds. Non-availability of seeds of the desired species forces the managers of nurseries to either wait till seeds of these species are available or to raise plants of whatever species whose seeds are available, even if suchspecies are neither suitable for climatic and edaphic conditions of the State nor required by intended beneficiaries of afforestation works.

1.3 Growth, productivity and survival of afforestation worksdepend on genetic makeup of plants used in these works. Use of seeds and propagules of superior genetic makeup may substantially enhance productivity, growth and survival of afforestation activities.

1.4 Non-availability ofseeds and other propagules of superior genetic makeup in time thereforeresults in sub-optimal performance of afforestation works. It is also one the main reasons for failure of afforestation activities in the State.

2. PROPOSAL

2.1 Project Components: To ensure timely availability ofgood quality certified seeds and other propagules of superior genetic makeup offorestry species suitable for climatic and edaphic conditions of the Statehaving good economic value and market demand,it is proposed to establish a seamless supply chain. The same will involve the following components:

(i) Prioritization of 50 important species for development of initial phase of supply chain.

(ii) Establishment of *in-situ* and *ex-situ* sources of seeds and other propagules of superior genetic makeup of prioritised species.

(iii) Standardization of collection, extraction, drying and pre-storage treatment of the seeds of prioritised species.

(iv) Establishment of seed storage facilities.

(v) Procurement and installation of seed testing equipment.

(vi) Establishment of institutional and infrastructural set up for timely collection, extraction, processing, testing and sowing of seeds of recalcitrant species which cannot survive drying and freezing.

(vi) Capacity building onseed collection, extraction, drying, processing, testing and storage.

2.2 Details of activities to be undertaken under each project component: Details of activities to be undertaken toestablish each component of the supply chain are as below:

2.2.1 Prioritization of Species

2.2.1.1 Based on climatic, edaphic, topographic conditions in the State and natural presence, distribution, economic value and market demand of various species, following 50 forestry species have been tentatively identified for development of supply chain in the first phase:

1. *Adina cordifolia*
2. *Aegle marmelos*
3. *Aesculesindica*
4. *Alnusnepalensis*
5. *Amoorawallichii*
6. *Anthocephaluschinensis*
7. *Aquillariamalacensis*
8. *Artocarpuschaplasha*
9. *Artocarpusintegrifolia*
10. *Bombaxceiba*
11. *Callistemon viminalis*
12. *Casia fistula*
13. *Castonopsisindica*
14. *Chukrasiatabularis*

15. *Cinnamomumtamala*
16. *Dalbergiaassamica*
17. *Dalbergiasissoo*
18. *Delonixregia*
19. *Duabanga grandiflora*
20. *Dysoxylumhamiltonii*
21. *Emblica officinalis*
22. *Exbucklandiapupulnea*
23. *Gmelinaarborea*
24. *Grevillea robusta*
25. *Ilex khasiana*
26. *Kayeaassamica*
27. *Lagerstroemia speciosa*
28. *Mesuaferrea*
29. *Magnolia champaca*
30. *Mimusopuselengi*
31. *Morus alba*
32. *Pinus kesia*
33. *Phoebe goalparensis*
34. *Pongamiapinnata*
35. *Prunusnepalensis*
36. *Prunuscerasoides*
37. *Sapiumbaccatum*
38. *Schimawallichii*
39. *Shorearobusta*
40. *Sterculiaurenus*
41. *Szygiumjambolanum*
42. *Tamarindusindica*
43. *Taxusbaccata*
44. *Tectonagrandis*

45. *Terminalia arjuna*
46. *Terminalia bellirica*
47. *Terminalia myriocarpa*
48. *Tetramelesnudiflora*
49. *Toonaciliate*
50. *Tremaorientalis*

2.2.1.2 At beginning of the project, an Inception Workshop will be organised to critically examine activities proposed to be undertaken under the project,including the tentative list of species prioritized for development of supply chain andto suggest appropriate amendments therein. Officers and other experts in Forest and Environment and other Departments, Agencies, Organisations and Authorities in Meghalaya involved in afforestation works;representatives of Forest Department in other North Eastern States; Researchers; Academicians; representatives of Autonomous District Councilsand members of reputed Civil Society Organisations involved in forestry activities will be invited to the Workshop. To facilitate informed discussions during the Workshop, a copy of the proposalwillbe sharedwith the invitees well in advance. A copy of the proposal will also be placed on website of the Forests and Environment Department to invite comments from all interested stakeholders. Based on discussions held during the Workshop and comments of stakeholders, 50 speciesfor development of supply chain will be finalized.

2.2.2 Establishment of Sources of Seeds and Plant Propagules of Superior Genetic Makeup: Project aims to establish, manage and utilize both *in-situ* as well as *ex-situ* sources of seeds and other planting materials of superior genetic makeup. The project aims to identify, delineate and manage 500 hectare (on an average 10 hectares for each prioritised species) in-*situ* seed production areas and seed stands containing vigorously growing and vigorously flowering medium aged trees meeting the selection criteria specified for each such species and 60 hectares *ex-situ* seed sources by planting seedlings, rooted cutting and tissue cultured plants sourced from superior quality trees. To ensure vigorous growth and flowering, *ex-situ* seed sources will be raised in natural habitats of each prioritised species. Project also aims to identify candidates plus trees (CPTs) of priority species having superior morphological/phenotypic characteristics. While undertaking survey for identification of CPTs, old growth threes will also be identified and documented for future protection. Details of activities to be undertaken for establishment of *in-situ* and *ex-situ* sources are as below:

2.2.2.1 Establishment of *in-situ* Seed Production Areas and Seed Stands: Details of the activities to be undertaken for identification, delineation, establishment and management of *in-situ* seed production areas and seed stands are as below:

(i) Formulation of parameters/characteristics for designation of an area as a Seed Stand (SS) or Seed Production Area (SPA) for each prioritised species in consultation with research institutes and individual experts.

(ii) Survey of existing forests, plantations and tree stands to identify and delineate the areas which meet parameters/characteristics formulated for designation of an area as Seed Stand or Seed Production Area of each prioritised species.

(iii) Improvement of Seed Production Areas and Seed Stands by culling of inferior quality individuals and by undertaking other cultural operations like climber cutting, weeding, soil and moisture conservation measures *etc.*

2.2.2.2 Establishment of *Ex-situ* Sources of Seeds and Other Plant Propagules of Superior Genetic Makeup: It is proposed to establish *ex-situ* sources of seeds and other planting materials of superior genetic makeup such as Seedling Seed Orchard (SSO), Clonal Orchard (CS), Vegetative Multiplication Garden (VMG), Seedling Seed Orchard Cum Progeny Trial (SSO cum PT), Clonal Orchards cum Progeny Trial (CSO cum PT). Each of these *ex-situ* sources will be raised by planting seedlings or rooted cutting or tissue cultured plants raised by using propagules sourced from plants of proved or likely superior genetic makeup at 2.5 m x 2.5 m spacing. These areas will have 1,600 plants per hectare. The entire 60 hectares *ex-situ* seed and other plant propagules production sites will have 96,000 plants. The following plots of lands having a total 60 hectare area are proposed to be utilised for development of *ex-situ* sources of seeds and other plan propagules of superior genetic makeup:

(i) 32 hectare land transferred in favour of the Forest and Environment Department at Daruggre for raising compensatory afforestation in lieuof 31.558 hectaredeemed forest land diverted in favour of Nangalbibra Bongaigaon Transmission line for construction of 400 KV DCNagalbibra Bongaigaon Transmission Line, as per map enclosed as **Annexure-I.**

(ii) 10 hectare land located within the Rongrenggre Reserve Forest, as per map enclosed as **Annexure-II.**

(iii) 5 hectare land located within the Rongrenggre Reserve Forest, as per map enclosed as **Annexure-III.**

(iv) 3 hectare land located at Experimental Plot of Silviculture Division located at Lumsohpatblang, as per map enclosed as **Annexure-IV.**

(v) 7 hectares land owned by Jaintia Hills Autonomous District Council located at Minkjai Village, West Jaintia Hills District, as per map enclosed as **Annexure-V.**

(vi) 3 hectares land owned by Jaintia Hills Autonomous District Council located at Jarain Village, East Jaintia Hills District, as per map enclosed as **Annexure-VI.**

Establishment of *ex-situ* sources will involve following activities:

2.2.2.2.1 Obtaining/Procuring License to Utilize Seeds and Other Propagules of Certified Clones and Plus Trees of Priority Species: Prioritized species for which Certified Clones and Plus Trees already exist, permission/license to utilize seeds, cuttings and other propagules of such clones/plus trees to raise Seedling Seed Orchards and Clonal Orchards will be obtained from the respective owners/licenseesfree of cost or on payment of license fee, wherever concerned licensee insists for such fee.

2.2.2.2.2 Establishment of Seedling Seed Orchards: Seedlings Seed Orchards (SSOs) will be established by plantingseedlings raised from seeds sourced from certified clones and plus trees. The plants raised at the SSOs will be intensively maintained for a period of six years so that they are fully established. During maintenance, inferior quality plants, if any, will be culled to maintain genetic superiority of Orchards.

2.2.2.2.3 Establishment of Clonal Seed Orchards: Clonal seed orchards will be established by planting rooted cuttings and tissue cultured plants raised from propagules sourced from certified clones and plus trees. The plants raised at the SSOs will be maintained for a period of six years so that they are fully established. During maintenance, inferior quality plants, if any, will be culled to maintain genetic superiority of Orchards.

2.2.2.2.4 Establishment of Vegetative Multiplication Gardens (VMG): To ensure availability of mother plants of genetically superior makeup for raising rooted cuttings and tissue cultured plants of prioritised species, vegetative multiplication gardens(VMGs) of prioritised species will be established by planting rooted cuttings and tissue cultured plants raised by using propagules sourced from certified

clones and plus trees. To increase availability and also to facilitate easy collection of cuttings, plants raised at VMGs will be appropriately trimmed and managed to ensure that they grow in a bushy form.

2.2.2.2.5 Identification of Candidates PlusTrees and Heritage/Old Growth Trees: Candidates Plus Trees are the trees having superior phenotypic/morphological features. In consultation with research institutes and other domain experts, morphological/phenotypic features/ parameters for classification of a trees of prioritised species as Candidate Plus Tree (CPT) will be formulated. Morphological/phenotypic features for designation of Trees of various species as Heritage/Old Growthtree will also be formulated. Based on morphological/phenotypic features/characteristics, candidates plus trees of prioritized species will be identified and marked for collection of seeds and other propagules for establishment of Seedling Seed Orchards cum Progeny Trials and Clonal Orchards cum Progeny Trials to assess their genetic superiority. Till lack of genetic superiority of a CPT is established through progeny trial, seeds, cuttings and other propagules of CPTs will be utilised for raising seedlings, rooted cuttings and tissue cultured plants, in case adequate alternate sources of proven genetic superior make up to meetrequirements of the Department are not available. Identification of CPTsand Heritage/Old Growth Trees will involve following steps:

(i) Listing of morphological/phenotypic features for identification of CPT for each prioritized species.

(ii) Listing of morphological/phenotypic features for classification oftrees of various species as a Heritage/Old Growth tree.

(iii) Survey of forests, plantations and isolated trees to select the trees which meet morphological features listed for identification of CPTs and Heritage/Old Growth Trees.

(iv) Recording of geo-coordinates, placing of indelible identification marks and preparation of a dossier containing full description of each identified CPT and Heritage/Old Growth Tree.

2.2.2.2.6 Establishment of Seedling Seed Orchards (SSOs) cum Progeny Trials (PTs): Seedling Seeds Orchards cum Progeny Trial for each CPT will be established by planting seedlings raised from seeds collected from such CPT to assess itsgenetic superiority and also to act as source of superior quality seeds. Seedling Seeds Orchards cum Progeny Trials will be intensively maintained for 6 years to ensure that the plants raised therein are fully established. Certainphenotypic/morphological parameters/characteristics identified to assess genetic superiority of each species, such as diameter at breast height (dbh), clear bole height, straightness of the bole, *etc.*of each plant raised at Seedling Seeds Orchards cum Progeny Trials will bemeasured and analyzed to ascertain genetic superiority of the mother

plant. Inferior quality plants which do not exhibit desired phenotypic characters of their respective mother plants will be culled from the Seedlings Seed Orchards cum Progeny Trials. Mother plants of all such inferior quality plants will be excluded from the list of CPTs.CPTs, whose progenies exhibit superior phenotypic/morphological parameters/characteristics will be designated as Plus Trees. Each such Plus Tree will be assigned a unique identification code.

2.2.2.2.7 Establishment of Clonal Orchards cum Progeny Trials: Clonal Orchard cum Progeny Trial for each CPT will be established by planting rooted cuttings and tissue cultured plants raised from propagules sourced from CPTs of prioritized species to assess genetic superiority of each such CPT and also to act as a source of superior quality seeds. Plants raised at Clonal Orchard cum Progeny Trial will be intensively maintained for 6 years to ensure that they are fully established. Certain phenotypic/morphological parameters/characteristics identified to assess genetic superiority of each species, such as diameter at breast height (dbh), clear bole height, straightness of the bole, *etc.* of each plant raised at Clonal Orchard cum Progeny Trial will be measured and analyzed to ascertain genetic superiority of the mother plant. Inferior quality plants which do not exhibit desired morphological/phenotypic characters of their respective mother plants will be culled from the Clonal Orchards cum Progeny Trials. Mother plants of all such inferior quality plants will be excluded from the list of CPTs. CPTs, whose progenies exhibit superior phenotypic/morphological parameters/characteristics will be designated as Plus Trees. Each such Plus Tree will be assigned a unique identification code.

2.2.3 Standardization of Collection, Extraction, drying andPre-Storage Treatment: To facilitatetimely collection, extraction and pre-storage treatment of seedsin an efficient, effective and a timely manner so that the seeds do not lose their viability, the following activities are proposed to be undertaken for each prioritised species:

(i) Listing of fruiting and seed collection season.

(ii) Listing of morphological/phenotypic features of fruits and seeds to confirm ripening or readiness for seed collection.

(iii) Compilation of the prevailing practices for collection, extraction, drying and pre-storage treatment.

(iv) Compilation of information on tools, equipments, machineries available in the market which may be utilised for collection, extraction, drying and pre-storage treatment

(v) Method study to standardizeprocesses and techniques forcollection, extraction, drying and pre-storage treatment by critical examination of existing and all probable processes and techniques, eliminating avoidable and wasteful activities in each such process and technique, and avoidable and

wasteful movements in each unavoidable activity in each existing as well as probable process and techniques and to finally select the most efficient and cost-effective processes and techniques.

(vi) Documentation of standardized processes and techniques by preparing a manual containing complete written description along with drawings, specifications and pictorial description (wherever required) of each such process and technique as well as each implement, equipment, plant and machinery used therein.

2.2.4 Establishment of Seed Storage and Testing Facilities: Process for raising plants in nurseries for majority of forestry species starts in the month of June-July. Fruiting and seed collection season for various species however, varies from species to species. Extent of fruiting and seed production per year also varies from year to year. Seeds therefore needto be stored till they are required for raising plants in nurseries. A sufficient buffer stock of the seeds of each prioritised species is also required to be maintained to address annual fluctuations in availability and requirement of seeds of various prioritised species. Seeds lose their viability with increase in storage temperature and moisture content. Physical damage caused by impacts and injuries also adversely affect viability of seeds. Seeds therefore need to be stored in a cool and dry environment free from any danger of damage by pests or any physical impact or injury to reduce the metabolic activities and the process of natural aging. To ensure that viable and healthy seeds are only stored, it is necessary to test their viability and health at the time of their receipt. Viability and health of the seeds are also required to be tested at the time of their delivery from the storage facility. Following activities are proposed for establishment of seed storage and testing facilities:

2.2.4.1 Long Term Storage for Bio-Preservation

2.2.4.1.1 For long term preservation of rich biodiversity of the State, seeds of all seed bearing plants in the State are proposed to be collected and preserved for next one hundred years. To retain viability during such a long period, seeds are required to be preserved at -40^0 Ctemperature and 5 percenthumidity. Establishment, operation and maintenance of a facility for preservation of seeds at such low temperature and humidity will involve huge expenditure. It is therefore proposed to utilize long term storage facilities developed by the Indian Council of Agriculture Research (ICAR)-National Bureau of Plant Genetic Resources (NBPGR)for the purpose.

2.2.4.1.2 In collaboration with Regional Centre of NBPGR located in Shillong, a detailed program will be drawn for collection of seeds of all flowering plants naturally existing in Meghalaya. The seeds will be deposited with the NBPGR, with an understanding that a part of the seeds deposited with the NBPGR will be reserved for future use of the Department. A detailed methodology/standard operating procedure (SoP)

for prioritization of species and collection, deposit and retrieval of the seeds will be of formulated and communicated to all concerned for guidance and follow up.

2.2.4.2 Medium Term and Working Storage

2.2.4.2.1 For preservation of viability of seeds required for afforestation works undertaken in the State, seeds are proposed to be stored at 4 degree Celsius at 35 percent humidity. Most of the orthodox seeds stored in these conditions retain their viability for ten to fifteen years. To minimize cooling requirements, the storage facility is proposed to be established at existing land of the Siliviculture Division located in Upper Shillong at an elevation of about 1,900 meters above mean sea level.

2.2.4.2.2 Detailed specificationsof the proposed facility, consisting two modules, each having the capacity to store 5,000 to 7,500 kg seeds at a time, prepared in consultation with scientists and technical experts dealing with establishment and operation of similar facilities in the NBPGR, are enclosed as **Annexure-VII.**

2.2.4.2.3 To minimize cost in operation and maintenance of the storage facility, one of the module may be operated at working storage conditions of 15^0 C temperature and 15% humidity. At this temperature, the seeds can be stored to 2 to 3 years without any adverse impact on their viability.

2.2.4.2.4 In case adequate quantities of seedsof forestry species are not available,spare capacity of the seed storage facility will be made available to other Departments, Agencies, Organisations and private individuals for storage of seeds on payment of rent.

2.2.4.4 Seed Testing Facility

2.2.4.4.1 To test and ascertain that the seed received at and dispatched from the Storage Facility are viable, the storage facility will be provided with the following seed testing equipments:

Sl. No.	Name of Equipment	Quantity	Unit
1	Moisture Bottles (small and big)	100	Nos.
2	Mortar Pestle	20	Nos.
3	Metal Trays	20	Nos.
4	Hot Air Oven	2	Nos.
5	Self indicating silica gel	20	Kg

6	Airtight containers	100	Nos.
7	Glass Petri-plates	200	Nos.
8	Weighing Balance	2	Nos.
9	Laboratory Mixer Grinder	2	Nos.
10	Sealing Machine	2	Nos.
11	Scissors	10	Nos.
12	Tissue rolls	20	Nos.
13	Stapler	20	Nos.
14	Stapler pins	20	Nos.
15	Calculator	2	Nos.
16	Laboratory Note Book	20	Nos.
17	Large Scales	20	Nos.
18	Spatula	20	Nos.
19	Markers	20	Nos.
20	Desiccators	10	Nos.
21	Gloves	20	Boxes
22	Seed Germinators	6	No.
23	Germination Towel Papers (Size 18 inch x 12 inch)	20	Kg
24	Wax or Butter Papers (size 20 inch x 15 inch)	20	Kg
25	Petri-dishes (11 cm)	50	Nos.
26	Filter paper round (11 cm)	50	Pack
27	Distilled water bottles (wash bottles)	100	Nos.
28	Plastic Trays	50	Nos.
29	Alkathene (polythene) Bags	50	Kg
30	Rubber bands	5	Kg
31	TTZ (2,3,5- Triphenyltetrazolium chloride)	10	Kg
32	Beakers (25 and 50 ml)	100	Nos.
33	Measuring cylinder	4	Nos.
34	Aluminum Foil packets tri-layered	20	Nos.
35	Muslin bags	500	Nos.
36	Plastic Baskets	200	Nos.

37	Double Distilation Unit	2	Nos.
38	BoD Incubator	2	Nos.
39	Spectrophotometer	2	Nos.
40	Moisture Meter	4	Nos.
41	EC Meter	4	Nos.
42	pH Meter	4	Nos.

2.2.5 Establishment of Facilities for Timely Collection, Extraction, Testing, Pre-Sowing Treatment and Sowing of Seeds of Recalcitrant Species: Seeds of certain species are recalcitrant in nature. Seeds of these species are viable for a very limited period and lose their viability on drying or freezing. These seeds cannot be stored for longer duration. Arrangements therefore needto be made for timely collection, extraction, processing and sowing of these seeds as soon as they are collected.Following activities are proposed to be undertaken for timely collection, extraction, testing, pre-sowing treatment and sowing of seeds of recalcitrant species:

(i) Identification and listing of recalcitrant species.

(ii) Listing of fruiting and seed collection season.

(iii) Listing of morphological/phenotypic features to confirm ripening or readiness of fruit for seed collection.

(iv) Compilation of the prevailing practices for collection, extraction, processing, testing and pre-sowing treatment

(v) Compilation of information on tools, equipments, machineries available in the market which may be utilised for collection, extraction, testing and pre-sowing treatment

(vi) Method study to standardize processes and techniques for collection, extraction and pre-sowing treatment by critical examination of existing and all probable processes and techniques, eliminating avoidable and wasteful activities in each such process and technique, and avoidable and wasteful movements in each unavoidable activity in each existing as well as probable process and techniques and to finally select the most efficient and cost-effective processes and techniques.

(vii) Documentation of standardized processes and techniques by preparing a complete written description along with drawings, specifications and pictorial description (wherever required) of each such process and technique as well as each implement, equipment, plant and machinery used therein

(viii) Earmarking of nurseries for raising plants of recalcitrant species and synchronization of the activities for raising of nurseries with fruiting and ripening of the seeds of recalcitrant species.

2.2.5 Capacity Building of Persons Involved in Collection, Extraction, Drying, Pre-Storage Treatment, Storage and Testing of Seeds: To acquaint officials of Forest and Environment Departmentand various other Departments, Agencies and Organisations involved in afforestation activitieswith various aspects of collection, extraction, drying, pre-storage treatment, storage and testing the seeds of prioritised species, following activities are proposed to be undertaken:

2.2.5.1 Publication of Seed Manual: A manual containing details of each activity involved in collection, extraction, pre-storage treatment, storage, pre-sowing treatment and testing of seeds of prioritized species in a simple and easy to understand language will be prepared for guidance and reference of officials involved in these activities.Printed copy of the manual will be distributed to all concerned for reference and guidance. The manual to be prepared in English will be translated in Khasi, Jaintia and Garo languages for easy reference of field functionaries, farmers and other local residents not conversant with and fluent in English. A soft copy of manual and its translations in Khasi, Jaintia and Garo languages will also be prepared in e-book format and a copy thereof will be uploaded on website of Forest and Environment Department for guidance and reference by all concerned.

2.2.5.2 Publication of Handbooks: For easy reference and guidance by field officers hand books,covering important aspects relating to collection, extraction, drying, pre-storage treatment, storage and testing of seeds of prioritized species will be prepared for each of the prioritised species and the same will be distributed to all concerned for reference and guidance. The Handbooks to be prepared in English will be translated in Khasi, Jaintia and Garo languages for easy reference of field functionaries, farmers and other local residents not conversant with and fluent in English. A soft copy of Handbooks and their translations in Khasi, Jaintia and Garo languages will also be prepared in e-book format and a copy thereof will be uploaded on website of Forest and Environment Department for guidance and reference by all concerned.

2.2.5.3 Preparation of Informative Videos: For easy comprehension, informative videos covering various activities relating to collection, extraction, drying, pre-storage treatment, storage and pre-sowing treatment of seeds of prioritized species will be prepared and CDs containing a copy thereof will be distributed to all concerned for reference. The Video to be prepared in English will be dubbed in Khasi, Jaintia and Garo languages for easy reference of field functionaries, farmers and other local residents not conversant with and fluent in English. A copy of these videos will be uploaded on website of Forest and

Environment Department for guidance and reference by all concerned. A copy of these videos will also be uploaded on social media platforms like YouTube *etc.* for a wider reach.

2.2.5.4 Publication of Posters, Leaflets and Other IEC Materials: To create awareness about the importance of scientific collection, extraction, pre-storage treatment, storage and pre-sowing treatment of seeds of prioritized species and also to acquaint officials of the Forests and Environment Department and various other Departments, Agencies and Organisations involved in afforestation activities with various aspects of these activities, posters, leaflets and other IEC materials in easy to understand language will be prepared. Posters, leaflets and other IEC materials to be prepared in English will be translated in Khasi, Jaintia and Garo languages for easy reference of field functionaries, farmers and other local residents not conversant with and fluent in English. A copy of these Posters, Leaflets and various other IEC materials will also be uploaded on website of Forest and Environment Department for guidance and reference by all concerned.

2.2.5.5 Organization of Trainings: To acquaint officials of Forest and Environment Department and various other Departments, Agencies and Organisations involved in afforestation works within the State with various aspects of collection, extraction, processing, storage, drying, pre-sowing treatment and testing of seeds of prioritised species trainings will be organised. The trainings will involve both classroom as well as hands on components.

3. PROJECT DURATION

The project will have a total duration of 9 (nine) years. Plants raised under the project will be maintained for a period of six (06) years to ensure that they are safe from any damage by biotic pressure.

4 ESTIMATED OUTLAY

4.1 The project will have a total estimated outlay of Rs. 21,39,56,000 (rupees twenty one crore thirty nine lakh fifty six thousand only).Year-wise breakup of funds required for each activity proposed to be undertaken during the nine years is given in a statement enclosed as **Annexure-VIII.**

4.2 The estimated outlay has been prepared at the current wage rate of Rs. 395 per person-day for an unskilled person. A copy of Notification No. LBG.9/2023/ 5 dated 31.03.2023 issued by the Labour Department, Government of Meghalaya to revise the minimum wage for unskilled labourer*w.e.f.* 01.04.2023 is enclosed as **Annexure-IX.**

4.2 The estimated outlay has been prepared at the current wage rate of Rs. 395 per person-day for an unskilled person. A copy of Notification No. LBG.9/2023/ 5 dated 31.03.2023 issued by the Labour Department, Government of Meghalaya to revise the minimum wage for unskilled labourer *w.e.f.* 01.04.2023 is enclosed as **Annexure-IX.**

4.2 Out of the said estimated outlay, an amount of Rs. 2,89,56,000 (rupees two crore eighty nine lakh fifty six thousands only) will be met from the monies deposited in the Meghalaya State Compensatory Afforestation Fund by the Nangalbibra Bongaigaon Transmission Company Limited for raising compensatory afforestation in lieu of 31.558 hectare deemed forest land diverted in their favour for construction of 400 KV DC Nagalbibra Bongaigaon Transmission Line.

4.3 The balance amount of Rs. 18,50,00,000 (rupees eighteen crore fifty lakh only) will be met from the funds to be provided by the Meghalaya Basin Development Authority (MBDA) or any other source in the Government of Meghalaya.

5. IMPLEMENTATION MECHANISM

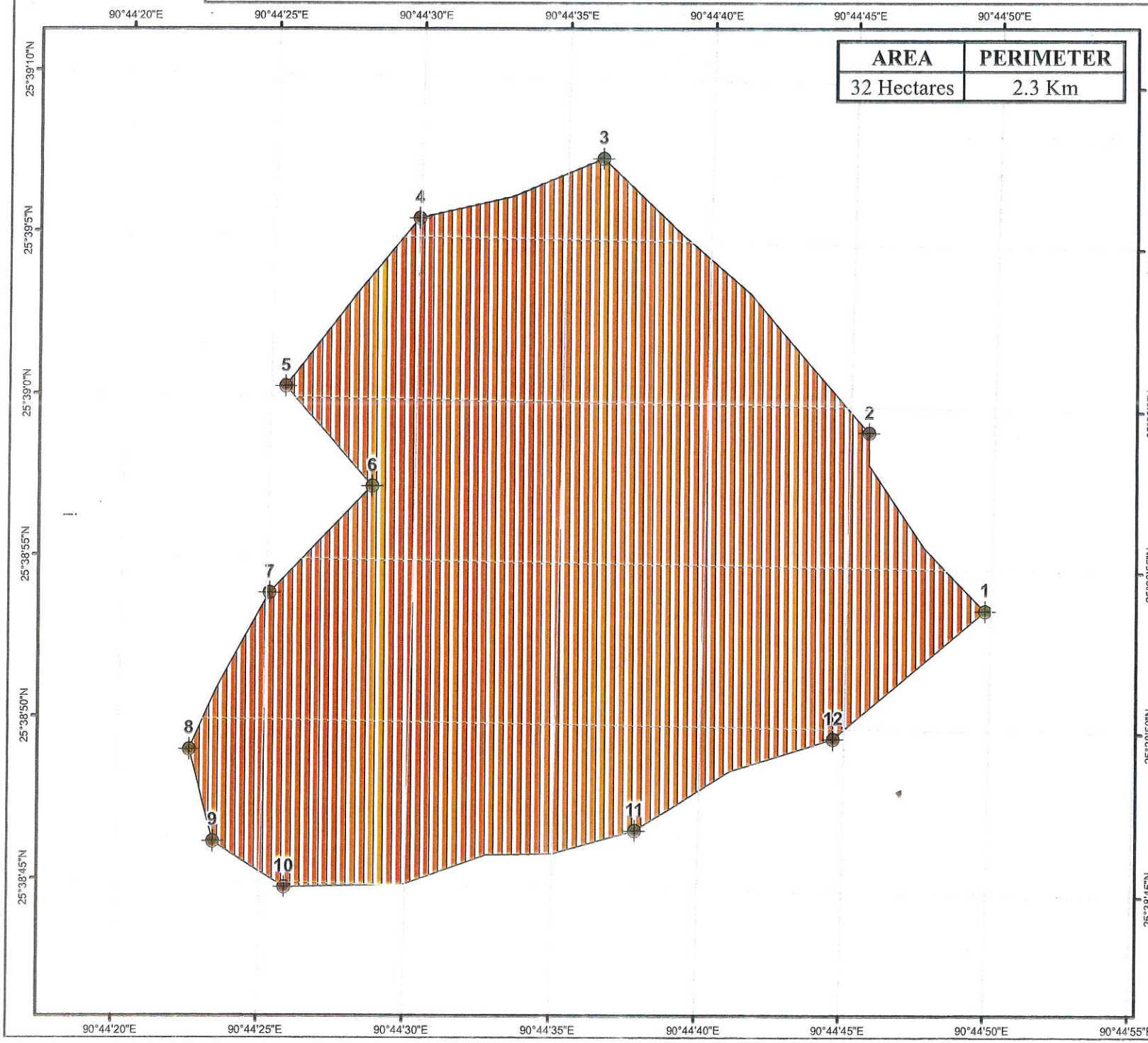
5.1 The project will be implemented by the Divisional Forest Officer, Silviculture Division under the overall superintendence, control and guidance of the Principal Chief Conservator of Forests, Working Plan, Research & Training and District Council Affairs.

5.2 A Project Management Unit (PMU) consisting of a Technical Assistant will be established in office of the Principal Chief Conservator of Forests, Working Plan, Research & Training and District Council Affairs to assist the Principal Chief Conservator of Forests and Divisional Forest Officers in planning and monitoring the progress in execution of various activities under the project and also to ensure timely submission of utilization certificate and physical and financial progress reports .

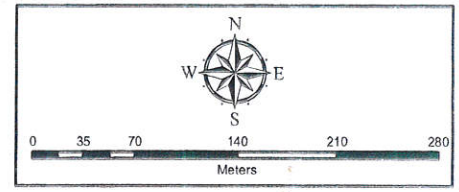
****

ANNEXURES

BOUNDARY MAP SHOWING PROPOSED SITE FOR SEED ORCHARD AT DARUGGRE (SITE – 3)



AREA	PERIMETER
32 Hectares	2.3 Km



WAYPOINT	LONGITUDE	LATITUDE
1	90° 44' 50.027" E	25° 38' 53.775" N
2	90° 44' 45.894" E	25° 38' 59.216" N
3	90° 44' 36.450" E	25° 39' 7.563" N
4	90° 44' 30.195" E	25° 39' 5.608" N
5	90° 44' 25.735" E	25° 39' 0.365" N
6	90° 44' 28.789" E	25° 38' 57.287" N
7	90° 44' 25.368" E	25° 38' 53.948" N
8	90° 44' 22.725" E	25° 38' 49.050" N
9	90° 44' 23.609" E	25° 38' 46.244" N
10	90° 44' 26.096" E	25° 38' 44.873" N
11	90° 44' 38.051" E	25° 38' 46.790" N
12	90° 44' 44.865" E	25° 38' 49.701" N

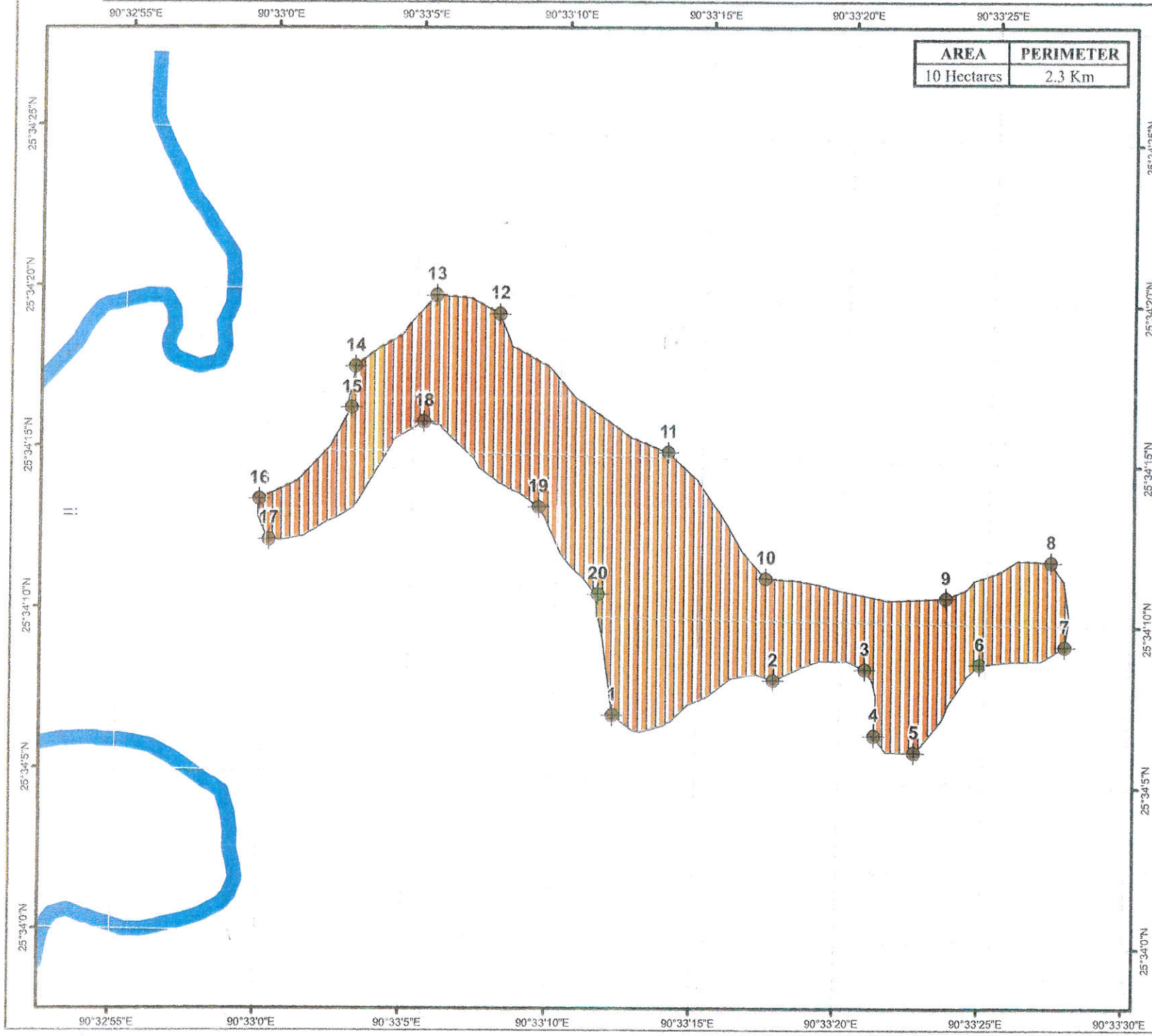
1 centimeter = 50 meters

WAYPOINT

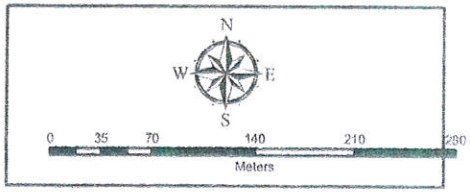
SITE

Annexure-I

BOUNDARY MAP SHOWING PROPOSED SITE FOR SEED ORCHARD AT RONGRENGGRE RESERVED FOREST (SITE - 2)



AREA	PERIMETER
10 Hectares	2.3 Km



WAYPOINT	LONGITUDE	LATITUDE
1	90° 33' 12.296" E	25° 34' 6.966" N
2	90° 33' 17.855" E	25° 34' 8.151" N
3	90° 33' 21.055" E	25° 34' 8.546" N
4	90° 33' 21.426" E	25° 34' 6.479" N
5	90° 33' 22.838" E	25° 34' 5.974" N
6	90° 33' 25.024" E	25° 34' 8.764" N
7	90° 33' 27.962" E	25° 34' 9.366" N
8	90° 33' 27.423" E	25° 34' 11.980" N
9	90° 33' 23.791" E	25° 34' 10.808" N
10	90° 33' 17.525" E	25° 34' 11.313" N
11	90° 33' 14.006" E	25° 34' 15.186" N
12	90° 33' 8.072" E	25° 34' 19.403" N
13	90° 33' 5.879" E	25° 34' 19.947" N
14	90° 33' 3.166" E	25° 34' 17.694" N
15	90° 33' 3.065" E	25° 34' 16.387" N
16	90° 32' 59.966" E	25° 34' 13.469" N
17	90° 33' 0.336" E	25° 34' 12.223" N
18	90° 33' 5.558" E	25° 34' 15.992" N
19	90° 33' 9.576" E	25° 34' 13.392" N
20	90° 33' 11.688" E	25° 34' 10.729" N

1 centimeter = 50 meters

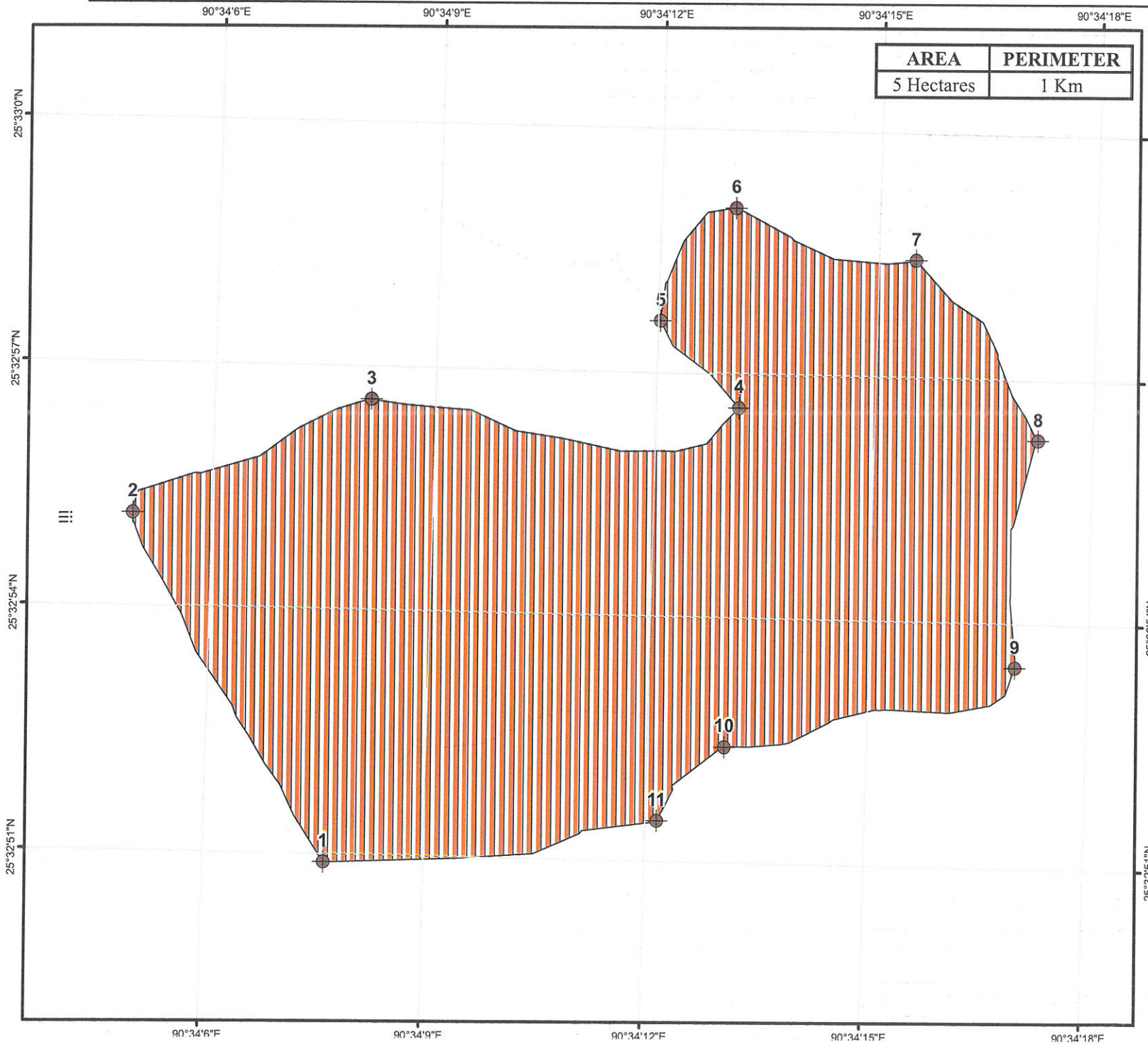
WAYPOINT

RIVER

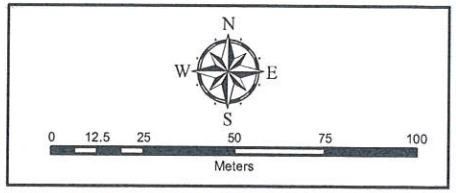
SITE FOR SEED ORCHARD

Annexure-II

BOUNDARY MAP SHOWING PROPOSED SITE FOR SEED ORCHARD AT RONGRENGGRE RESERVED FOREST (SITE – 1)



AREA	PERIMETER
5 Hectares	1 Km



WAYPOINT	LONGITUDE	LATITUDE
1	90° 34' 7.843" E	25° 32' 50.902" N
2	90° 34' 5.133" E	25° 32' 55.141" N
3	90° 34' 8.331" E	25° 32' 56.591" N
4	90° 34' 13.335" E	25° 32' 56.591" N
5	90° 34' 12.230" E	25° 32' 57.637" N
6	90° 34' 13.223" E	25° 32' 59.041" N
7	90° 34' 15.714" E	25° 32' 58.447" N
8	90° 34' 17.438" E	25° 32' 56.265" N
9	90° 34' 17.199" E	25° 32' 53.467" N
10	90° 34' 13.259" E	25° 32' 52.419" N
11	90° 34' 12.361" E	25° 32' 51.501" N

Annexure-III

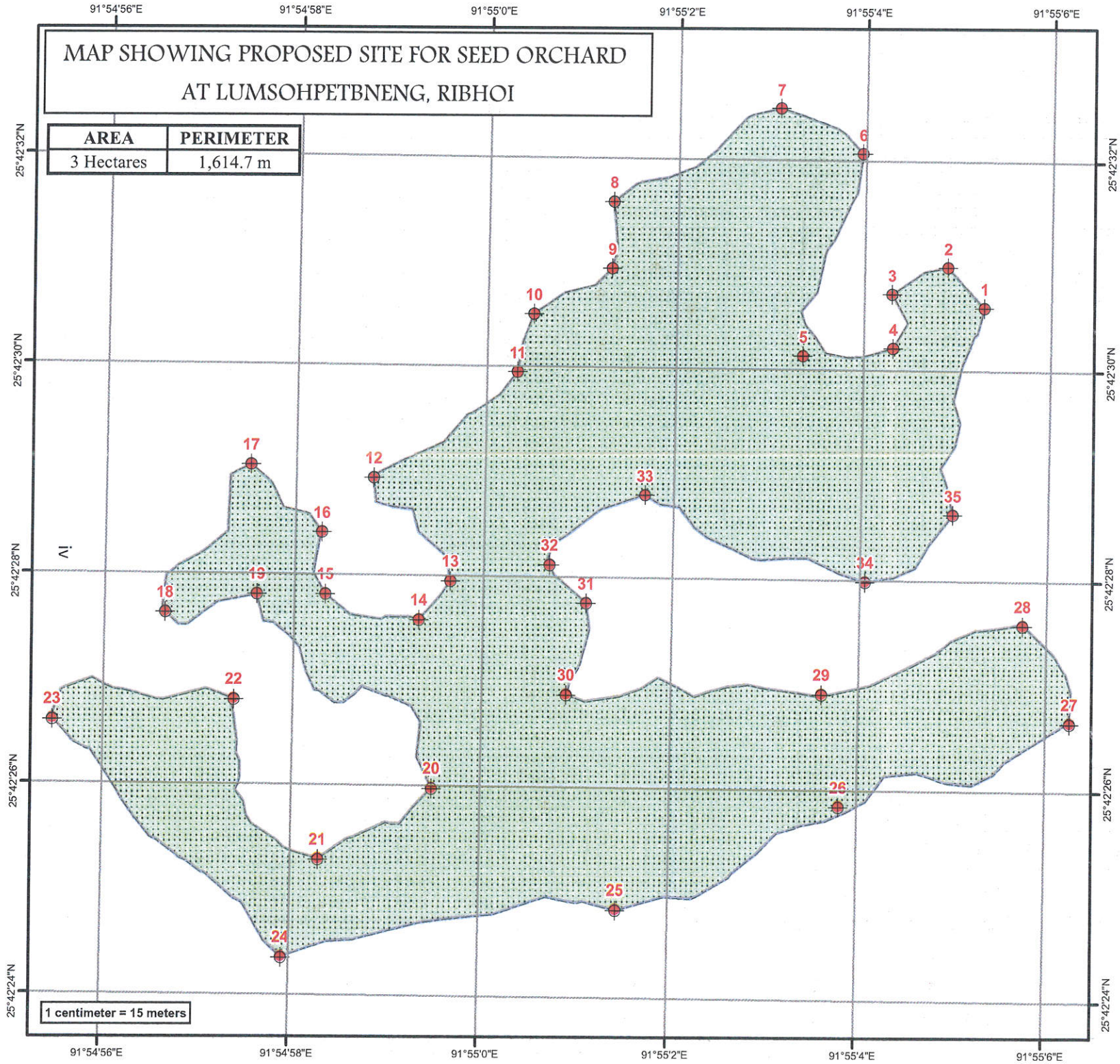
1 centimeter = 20 meters

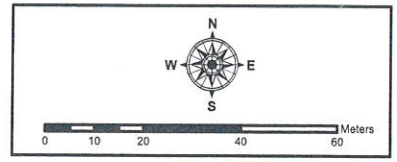
WAYPOINT

SITE FOR SEED ORCHARD

MAP SHOWING PROPOSED SITE FOR SEED ORCHARD AT LUMSOHPETBNENG, RIBHOI

AREA	PERIMETER
3 Hectares	1,614.7 m





AREA	PERIMETER
3 Hectares	1,614.7 m

WAYPOINT	LONGITUDE	LATITUDE
1	91° 55' 5.409" E	25° 42' 30.609" N
2	91° 55' 5.014" E	25° 42' 30.992" N
3	91° 55' 4.426" E	25° 42' 30.732" N
4	91° 55' 4.442" E	25° 42' 30.215" N
5	91° 55' 3.481" E	25° 42' 30.138" N
6	91° 55' 4.094" E	25° 42' 32.069" N
7	91° 55' 3.208" E	25° 42' 32.494" N
8	91° 55' 1.441" E	25° 42' 31.587" N
9	91° 55' 1.436" E	25° 42' 30.950" N
10	91° 55' 0.614" E	25° 42' 30.508" N
11	91° 55' 0.452" E	25° 42' 29.950" N
12	91° 54' 58.948" E	25° 42' 28.928" N
13	91° 54' 59.783" E	25° 42' 27.951" N
14	91° 54' 59.454" E	25° 42' 27.578" N
15	91° 54' 58.456" E	25° 42' 27.814" N
16	91° 54' 58.411" E	25° 42' 28.402" N
17	91° 54' 57.644" E	25° 42' 29.042" N
18	91° 54' 56.769" E	25° 42' 27.626" N
19	91° 54' 57.730" E	25° 42' 27.809" N
20	91° 54' 59.615" E	25° 42' 25.974" N
21	91° 54' 58.428" E	25° 42' 25.287" N
22	91° 54' 57.507" E	25° 42' 26.804" N
23	91° 54' 55.597" E	25° 42' 26.600" N
24	91° 54' 58.045" E	25° 42' 24.353" N
25	91° 55' 1.575" E	25° 42' 24.837" N
26	91° 55' 3.934" E	25° 42' 25.843" N
27	91° 55' 6.389" E	25° 42' 26.656" N
28	91° 55' 5.872" E	25° 42' 27.584" N
29	91° 55' 3.740" E	25° 42' 26.913" N
30	91° 55' 1.021" E	25° 42' 26.881" N
31	91° 55' 1.218" E	25° 42' 27.754" N
32	91° 55' 0.822" E	25° 42' 28.116" N
33	91° 55' 1.823" E	25° 42' 28.790" N
34	91° 55' 4.186" E	25° 42' 27.988" N
35	91° 55' 5.103" E	25° 42' 28.633" N

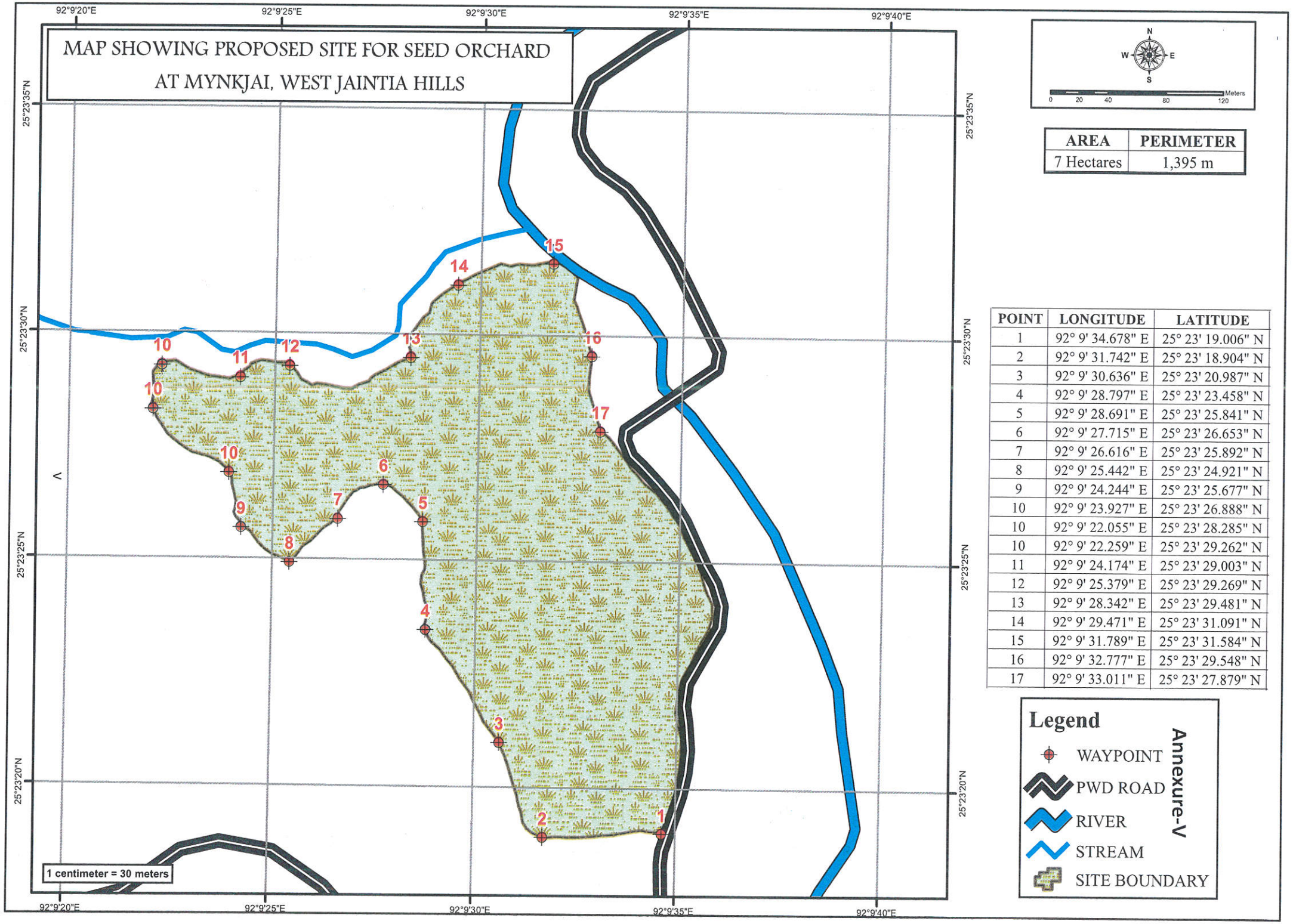
Legend

WAYPOINT

SITE BOUNDARY

Annexure-IV

MAP SHOWING PROPOSED SITE FOR SEED ORCHARD AT MYNKJAI, WEST JAINTIA HILLS



AREA	PERIMETER
7 Hectares	1,395 m

POINT	LONGITUDE	LATITUDE
1	92° 9' 34.678" E	25° 23' 19.006" N
2	92° 9' 31.742" E	25° 23' 18.904" N
3	92° 9' 30.636" E	25° 23' 20.987" N
4	92° 9' 28.797" E	25° 23' 23.458" N
5	92° 9' 28.691" E	25° 23' 25.841" N
6	92° 9' 27.715" E	25° 23' 26.653" N
7	92° 9' 26.616" E	25° 23' 25.892" N
8	92° 9' 25.442" E	25° 23' 24.921" N
9	92° 9' 24.244" E	25° 23' 25.677" N
10	92° 9' 23.927" E	25° 23' 26.888" N
10	92° 9' 22.055" E	25° 23' 28.285" N
10	92° 9' 22.259" E	25° 23' 29.262" N
11	92° 9' 24.174" E	25° 23' 29.003" N
12	92° 9' 25.379" E	25° 23' 29.269" N
13	92° 9' 28.342" E	25° 23' 29.481" N
14	92° 9' 29.471" E	25° 23' 31.091" N
15	92° 9' 31.789" E	25° 23' 31.584" N
16	92° 9' 32.777" E	25° 23' 29.548" N
17	92° 9' 33.011" E	25° 23' 27.879" N

Legend

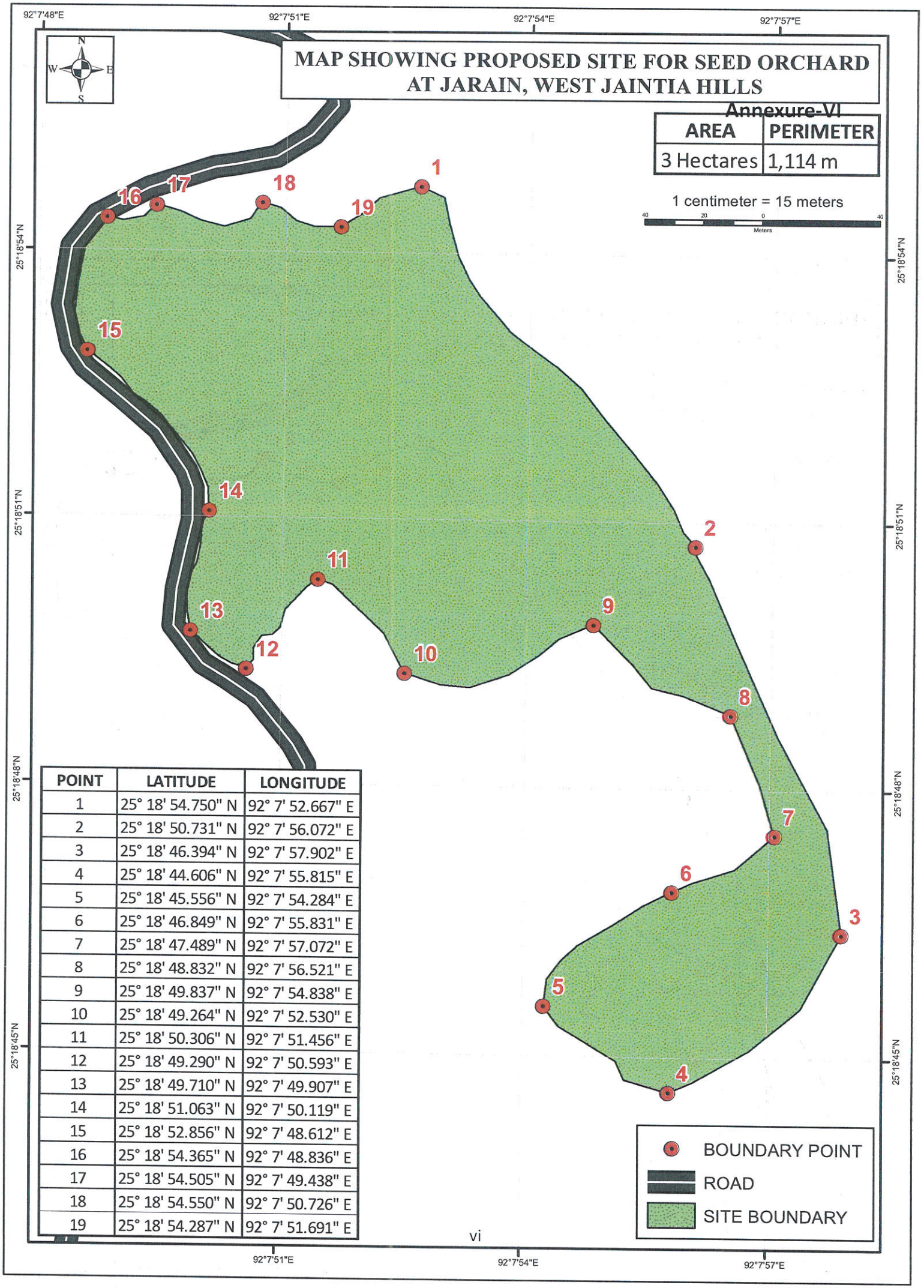
- WAYPOINT
- PWD ROAD
- RIVER
- STREAM
- SITE BOUNDARY

Annexure-V

MAP SHOWING PROPOSED SITE FOR SEED ORCHARD AT JARAIN, WEST JAINTIA HILLS

Annexure-VI

AREA	PERIMETER
3 Hectares	1,114 m



POINT	LATITUDE	LONGITUDE
1	25° 18' 54.750" N	92° 7' 52.667" E
2	25° 18' 50.731" N	92° 7' 56.072" E
3	25° 18' 46.394" N	92° 7' 57.902" E
4	25° 18' 44.606" N	92° 7' 55.815" E
5	25° 18' 45.556" N	92° 7' 54.284" E
6	25° 18' 46.849" N	92° 7' 55.831" E
7	25° 18' 47.489" N	92° 7' 57.072" E
8	25° 18' 48.832" N	92° 7' 56.521" E
9	25° 18' 49.837" N	92° 7' 54.838" E
10	25° 18' 49.264" N	92° 7' 52.530" E
11	25° 18' 50.306" N	92° 7' 51.456" E
12	25° 18' 49.290" N	92° 7' 50.593" E
13	25° 18' 49.710" N	92° 7' 49.907" E
14	25° 18' 51.063" N	92° 7' 50.119" E
15	25° 18' 52.856" N	92° 7' 48.612" E
16	25° 18' 54.365" N	92° 7' 48.836" E
17	25° 18' 54.505" N	92° 7' 49.438" E
18	25° 18' 54.550" N	92° 7' 50.726" E
19	25° 18' 54.287" N	92° 7' 51.691" E

Annexure-VII

Detailed Specifications of Seed Storage Facility

Medium Term Seed Storage Modules

1. The seed storage capacity for each MTS is about 5,000-7,500 Kg Seeds
2. A total number 2 Medium-Term Storage (MTS) modules (puff panels thickness ≥100 mm as per the present approval.
3. MTS modules to be maintained at +4 to 8°C temperature in peak ambient conditions of temperature and relative humidity at its location with size/dimension measuring 10 m x 4.5 m x 2.8 m: (L x B x H)
4. MTS module to be fitted with de-humidifier.
5. Pre-fabricated puff insulated, 100 mm thick, metallic sheet with white enamel paint, food safe, anti-microbial, joints sealed with approved silicon.
6. Galvanised steel flooring, automated door closure, heavy hinge locks and safety release, glass window $1m^2$
7. Voltage Range 300-460 V, 50 HZ , Three phase, AC, power supply, CFC free refrigerants, Hot gas by-pass system,
8. Outdoor, air-cooled refrigeration unit, constant/switch mode, dual compressors.
9. Seed Storage shall be fitted with rail mounted lockable seed shelves(each with sliding drawer seed cabinets with divisors inside), max in 8-10 tiers and made of powder coated CRCA sheets (may be perforated) and each shelf should have load bearing capacity of min 150 -200 kg.
10. Vapor protected light fixtures, mounted on frame, switch and pilot lights.

A. Module Control System

1. Full logic control using PID (Proportional-Integral-Derivative) Control System.
   Programmable alarms for multiple module functions and components.
2. Intelligent alarm system with multiple communication methods.
3. All data stored in module controller and uploaded to central management system.

4. Remote viewing and diagnostics of control parameters and module components from engineering staff work station.

5. Internet- compatible and access by supplier via Forest Department, MeghalayaLAN as and when required.

6. Fully independent control for each module with power supply board, input module and appropriate number of input and output boards for control of temperature.

7. Controller to have automatic switch over to secondary controller in the event of failure.

8. Aspirator: Non-rusting ABS aspirator to house controller sensors. Should include piping to connect.

9. The data available at the every display screen on the modules and CMS should include main module variables. All Parameters to be logged automatically every 15-20 seconds and could be viewed in the form of Trend graphs. Trend graphs could be viewed, with up to five-seven days of history, directly on the local display screen for both 'set-point' and 'actual' values. Zoom and Pan Functions shall be able to provide additional visualization tools allowing the user to precisely and accurately view and access the data. All refrigeration pressures and coil temperatures are to be viewable at controller screen and log both into control memory and set to main computerized control station.

10. The data shall be made available for all local variables with the display units: RH, temperature, lighting, carbon dioxide and displayed in graphical mode.

11. The data available remotely should include every input and output parameter being monitored and controlled. Data needs to be automatically logged every 20-30 seconds regardless of the number of parameters. It should provide adequate data resolution for the user and to the service personnel.

12. Alarms: Audible and color coded visual alarms should be provided at module controller for user-settable absolute alarms for all controlled processes and user-settable process tracking alarms for temperature. In addition, there should be "built in" alarms available for module component monitoring. Provision needs to be made for alarm history logged to daily text files which could be easily retrievable from any Ethernet connected computer (either with or without a Central Management) or through the local control screen.

13. Programmable 'ECONOMICAL' mode as per (refrigeration system specifications).

14. Password- protected levels reserved for users (three), administrator (one), technicians / Forest Department personnel as and when decided.

15. Start-Up Delay: Modules to be programmed with staggered restart should there be a power failure at facility to ensure the backup generators are not overloaded or when electrical systems come back on line.

16. Central Alarm Contacts for connection to the Gene bank Central Management System.

17. Surge protection and uninterrupted power supply, on controller only, for continuous operation of the controller during power interruptions, duration of the UPS to be approximately 5 hours.

18. Full remote capabilities from a central computer station to provide remote control, diagnostics and independent controls switch over. Ethernet backbone within the area housing the modules by contractor.

19. Central computer system to be capable to email intelligent alarms and SMS in event of system malfunction to multiple email accounts of the authorized users.

20. Entire assembly as a whole including all the above components must be of latest European Conformity (CE) or higher certification standards to be compatible to the existing facility.

21. In order to maintain hassle-free, safe and uninterrupted working of the Seed Storage modules, there should be smart fault detection system and IT level message so that with the advance knowledge of any anticipated fault, necessary correction measures can be taken by the concerned staff.

22. All supporting documentation must be supplied with technical tender.

B. Seed Storage- Central Management System (Seed Storage - CMS)

Seed storage - Central Management System must have the following features:

1. Ability to programme each room control system independently for Central Management Screen.
2. A supervisory dashboard to provide a quick overview of all operational modules with quick links to

separate full screen and should record each modules management details.

3. Logged data files in secured and light, file format like Comma Separated Value (CSV) file format, with duration of each file representing 24 hours period.
4. Alarm logging must maintain individual module alarm data file in secured and light file format like CSV format.
5. Seed Storage - CMS should have multiple alarm notification through connection to building services from a central point, autodialed voice messaging from a central point, internal audible alarm, global and individual email alert messages from client-configured alarms.
6. Digital compilation of Seed Storage- CMS archives which allows access to service history information.
7. Reporting of opening and closing of the module and running/stopping of the machinery fitted with the modules.
8. There should be provision of editing of the module properties data *e. g.* name of the tree species, name of the module, purpose etc. or any other relevant details.
9. There should be provision of Web reporting from the Seed Storage - CMS in a Web server which allows viewing of alarm, data log, trend graphs and service history from any web browser, and should also facilitate data downloading.
10. Hardware must include latest or Windows 11 Professional Operating System workstation computer or better/latest version for smooth and efficient operation of Seed Storage - CMS and should be able to send web reports to intended users through existing LAN system of Forest Department, Meghalaya.
11. Communication from the module to Seed Storage - CMS should be secure and compatible with the LAN at Forest Department, Meghalaya.

C. Security and safety

1. Levels of passwords which allow for different access for the varying levels of the control system.
2. MTS doors of 6ft. 7in. x 3ft. 2in. fixed with suitable aluminium skinned polyurethane cored, low temperature design. Should consist of magnetic seals, heat jams and heated dual pan observation window of 14 in. x 14 in. size. Doors must include biometric entry lock and internal emergency opener and emergency alarm system.
3. Exterior mount panic alarm with strobe light and quick release interior panic button to unlock door, also connected to building security system.

x

4. Security lighting to be automatically switched on in event of power failure.

5. The best technology for Safety and Security System of machinery and human beings should be incorporated in the modernization design and 3 levels of password should be followed, which allow for different access to the varying levels of the control system and biometric entry passage lock.

D. Refrigeration System

1. A total number 2 Medium-Term Storage (MTS) modules (puff panels thickness ≥100 mm)

2. Two (2) MTS modules to be maintained at +4 to 8□C±1°C temperature and 30-35% Relative Humidity in peak ambient conditions of temperature and relative humidity at its location with size/dimension measuring 5 m x 4.5 m x 2.8 m: L x B x H

3. Each MTS module to be fitted with de-humidifier.

4. Vendor has to provide redundant refrigeration system including compressor, remote condensing systems and evaporators with R404A/R410A Refrigerant system or the latest as per CE. Full redundancy control of switch over through controller in case of system failure.

5. Pre-fabricated puff insulated, 100 mm thick, metallic galvanised steel sheet with white enamel paint, food safe, anti-microbial, joints sealed with approved silicon

6. Galvanised steel flooring, insulated flooring for low temperature operation

7. Automated door closure, heavy hinge locks and safety release, glass window of appox. $1m^2$ doors fitted with thermal gasket, positive closer device and door stop

8. Voltage range 300-460 V, 50 HZ three phase AC power supply, CFC free refrigerants, Hot gas by-pass system

9. Outdoor, air-cooled refrigeration unit, constant/switch mode, dual compressors

10. Gene banks shall be fitted with rail mounted lockable seed shelves(each with sliding drawer seed cabinets with divisors inside), max in 8-10 tiers and made of powder coated CRCA sheets(may be perforated) and each shelf should have load bearing capacity of min 150 -200 kg.

11. Vapor protected light fixtures, mounted on frame, switch and pilot lights.

12. Vendor must supply two fully independent refrigeration systems at each module with adequate capacity which is capable of maintaining +4 to 8□C in MTS, constantly with a maximum

temperature variation of ± 1 C at sensor location. The compressor must have a minimum warranty period of five years and to be of preferably hermatic type. The compressor may be equipped with VFD (Variable Frequency Drive) for capacity control.

13. Refrigeration system must be continuous running to maintain temperature uniformly throughout the module and equipped with hot gas bypass defrosting system.

14. High and low pressure regulators must be able to trigger not only alarms but also the secondary control system to allow for automatic switch over in event of failure. Pressure to be displayed and logged at module controller as well as at Genebank – Central Management System.

15. All systems must have pressure transducers on both high (discharge) and low sides (suction). Information must be displayed through module control system.

16. Evaporator coil temperature sensors must be readable through control system.

17. Compressors and receivers must be in the corridor behind the modules to allow for easy maintenance and all weather condensers must be exterior to the building. Vendor should be responsible for all inter connection refrigeration and control line.

18. Anti-vibration Mechanism for Machinery: To ensure proper functioning and enhanced durability, the machinery should be well balanced and vibration tolerant.

19. Ensure working of module uninterruptedly.

20. The remote defrosting on cooling units should be automated with inherent need based on on/off mechanism. Every Medium Term Storage (MTS) door's opening should be ice free and have peeping windows.

21. Programmable 'ECONOMICAL' mode. Hot gas system should automatically shut down and the system should be capable of running in ON/OFF mode with a maximum of 1 C temperature variation at sensor location.

22. Wall panels of bonded paneling construction with 4 inch of foams in place of CFC free polyurethane insulation.

23. Interior and Exterior Finish: White enamel backed.

24. All panels assembled from interior with suitable camlock fasterners/couplers.

25. Small ante room after the door with air lock for entry/exit options.

26. Door: One door with inside safety release latch and cam type , self closing hinges, Door must

have positive closure device, thermal plastic gasket with magnetic core and door stop.

27. Insulated floor for low tem requirements

28. LED Lighting, control panel be erected on exterior, lamp heat removed by refrigeration system

E. Humidity system for MTS Module

1. Vendor to provide additive dehumidification components.

2. All components to be 100% redundant by supply of secondary system.

3. Dehumidification must be by chemical drier and not by refrigeration.

4. Each chemical drier must have a minimum process air flow rate of 300 cfm.

5. Chemical driers should be of shaft drive wheel type, and capable of maintaining the module at a minimum value of a 30 to 35% Relative Humidity round the year.

6. Chemical drier must be certified by European Conformity or higher certification agency.

F. Material Handling, Installation and Commissioning

1. No damage of any kind will be acceptable in the given plan.

2. All works must be completed by the authorized trained personnel of the vendor.

3. All work must be done with all sanitary precautions with safety precautions and on condition that the work site will not be contaminated in any way.

4. All excess materials and refuse must be removed from site and disposed on a daily basis by the vendor to keep the site clean and workable.

5. Complete and comprehensive project plan and scope along with design etc, if any, must be provided at time of tender.

G. Maintenance of Upgraded facility by vendor through trained personnel/ engineer

1. Vendor should include the backup spare parts for minimum five years at his cost and the Staff to be engaged by the Forest and Environment Department to operate and manage the Seed Storage should be sufficiently trained in handling and maintenance of Seed Storage modules.

2. Vendor should depute trained and experienced personnel/engineer at his cost to rectify any defect/ malfunctioning of the Seed Storage. Such person/engineer within 48 hours from the date of receipt of intimation of defect during a period of 5 (five) years from the date of completion of the project by the Vendor.

H. Civil/Electrical work/Additional Terms and conditions

The supply/installation/commissioning/Operationalisation of Seed Storage, will also include the following synchronized civil and electrical work:

1. Vitrified tiling, with adequate provision of LED lighting, AC outlet, CCTV outlet and conduiting of the Gallery matching with the existing aesthetics of the Gene bank. Colour and design of the tiles and ceiling should be approved by the Competent Authority of Forest Department, Meghalaya.

2. Vendors should provide 48 KVA servo stabilizers for MTS module and the stabilizers hooked to MTS modules, with specification of input voltage range 300-460 V, 50 Hz, three phase AC supply and output voltage of 380V ±1%.

3. Vender / bidder must visit the site for the exact measurement and quantity of materials etc.

4. Vender / bidder should be OEM / authorized dealer of OEM having proper experience and certificates issued by national / international certification agencies.

5. Vendor/bidder should be registered with MSME/any other Govt. agency for the specific job mentioned in tender. The bidder will submit the proof of the same.

6. Vender / bidder should have the facility network with trained personnel to provide after sale service within a time limit.

7. The equipment should be equipped with all necessary accessories, microprocessors, sensors, controllers and safety devices with testing certificates (CE, ISO etc).

8. Vendor will provide a list of satisfied clients with certificates issued by them. Officials of the Forest and Environment Department, Meghalaya may visit the sites of the clients on the cost of bidder.

****

GOVERNMENT OF MEGHALAYA
LABOUR DEPARTMENT

*****

Annexure-W

NOTIFICATION
Dated Shillong, the 31st March, 2023

LBG. 9/2023/5 – In exercise of the powers sub-section (2) of Section 5 of the Minimum Wages Act, 1948 (Central Act XI of 1948) as amended, the Governor of Meghalaya is pleased to revise the rates of minimum wages in respect of the following schedule of Employments all categorized and defined as indicated in the table below :-

(1) Agriculture (2) Construction and maintenance of Buildings including Public Health Engineering, etc., (3) Stone crushing and breaking operations (4) Construction, Generation and Distribution of Powers, Water supply, land development excavation and reclamation, (5) Sericulture & Weaving, (6) Fruit Preservation, (7) Soil Conservation, (8) Animal Husbandry and Veterinary, (9) Forest, (10) Local Authority, (11) Public Motor Transport (12) Saw Mill, (13) Plywood Industry, (14) Motor Workshops, (15) Furniture Industry, (16) Bakery (17) Shops and Establishment, (18) Printing Press (19) Sales, Distribution and handling of petroleum products (20) Steel Fabrication and concrete products including brick making, (21) Tailoring, (22) Wax and Candle industry (23) Hotels and Restaurants (24) Mines and Minerals(25) Safai Karamcharis (26) Employment in Registered Factories not elsewhere classified (27) Employment under Government Authority (casual contingency Employee) (28) Domestic Workers and (29) Security Guard :-

(2)

Sl. No.	Category	Minimum wage + Revised VDA payable w.e.f. 1st October, 2022
1.	Unskilled	₹300/- + 95 = ₹395/-
2.	Semi-skilled	₹340/- + 107 = ₹447/-
3.	Skilled	₹380/- + 120 = ₹500/-
4.	Highly-skilled	₹420/- + 133 = ₹553/-

The above rates of minimum wages are effective from 1st April, 2023.

Explanation:

1. **UNSKILLED** : means work which involves simple operation, little or no skill or experience in the job.
2. **SEMI-SKILLED**: means work which involves some degree of skill and competence acquired through experience on the job which is capable of being performed under the supervision and guidance of skilled employees and includes unskilled supervisory works.
3. **SKILLED** : means work which involves skill or competence acquired through experience on the job or through training as apprentice in a technical or vocational institute and the performance of which calls for initiative and judgement.
4. **HIGHLY SKILLED** : means expert in the work requiring great skills.

The revised rates proposed are inclusive of Variable Dearness Allowance but exclusive of other concession if any enjoyed by the employees. The existing task and hours of work i.e. 8 (eight) hours a day 48 (forty eight) hours a week shall continue until further orders. The Minimum rates of wages proposed include the wages payable for weekly day of rest. The rate of wages of overtime work shall be double the ordinary rate of wages.

The revised rates shall be deemed to come in force with effect from 01.10.2022 and will be revised every 6 (six) months by adoption of Consumer Price Index (CPI) linked Variable Dearness Allowance (VDA).

This supersedes this Department's earlier Notification No.LBG.75/2012/422 dt. 21.10.2022.

Contd.....2/-

The Variable Dearness Allowance has been rounded off to the next higher rupee.

This issues with the concurrence of Finance Department vide I/D No.F(PR) 98/2023 dt 28.03.2023.

Sd/-
Shri. B. Hajong, IAS ,
Secretary to the Govt. of Meghalaya,
Labour Department.
***

Memo No. LBG 9/2023/5-A **Dated Shillong, the 31st March, 2023.**

Copy to :

1. P.S. to Chief Minister, Meghalaya for favour of kind information of Hon'ble Chief Minister.
2. P.S. to Minister i/c Labour, Meghalaya for favour of kind information of Minister
3. P.S. to all Ministers, Meghalaya for favour of kind information.
4. P.S. to Chief Secretary to the Govt. of Meghalaya for favour of kind information of the Chief Secretary.
5. The Additional Chief Secretary/Principal Secretary/Commissioner & Secretary/Secretary of all Departments
6. Finance (Pay Revision) Department (consulted I/D above).
7. All Administrative Department/All Heads of Department
8. The Labour Commissioner, Meghalaya, Shillong for information and necessary action.
9. Director of Information and Public Relations for wide publicity.
10. Director of Printing and Stationery, Meghalaya, Shillong for publication in the extra ordinary gazette and to supply 100 copies to this Department urgently.
11. Managing Director, MTC, Meghalaya, Shillong
12. Chairman/Chief Executive Officer, Shillong/Jowai/Tura/Williamnagar/Baghmara/Resubelpara Municipal Board
13. President, Frontier Chamber of Commerce, G.S. Road, Shillong-2
14. Managing Director, Meghalaya Plywood Pvt. Ltd C/o Bawri Mansion, Dhankheti, Shillong
15. General Secretary, Shillong Municipality Harijan Mazdoor Union, Bara Bazar, Harijan Colony, Shillong-2
16. President INTUC, Meghalaya Branch, Opp Lum Jingshai, Short Round Road, Shillong
17. General Secretary, AITUC, Meghalaya Branch, C/o CPI Officer, Quinton Road, Shillong-2
18. General Secretary, Meghalaya Power Workers' Union, C/o B.C. House, Me.E.C.L, Shillong-1
19. General Secretary, Garo Hills PWD, Labour Union, P.O. Tikrikilla, P.S. Phulbari
20. General Secretary, Shillong Municipal Employers' Association, Shillong
21. General Secretary, Meghalaya PWD, Muster Roll Workers' Union, C/o CPI Office, Quinton Road, Shillong-1

By Order etc.,

Deputy Secretary to the Govt. of Meghalaya,
Labour Department

Annexure-VIII

Detailed Estimates for Establishment of a Supply Chain For Assured Supply of Seeds and Other Propagules of Superior Genetic Makeup

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
A	**Prioritization of Species for Development of Supply Chain for Assured Supply of Seeds of Superior Genetic Make Up Under the Project**																						
A.1	Organization of an Inception Workshop	Nos.	4,00,000	1.00	4.000		-		-		-		-		-		-		-		-	1.00	4.000
	Sub-Total for 'A'				**4.000**		-		-		-		-		-		-		-		-		**4.000**
B.	**Establishment of *In-situ* and *Ex-situ* Sources of Seeds and Other Plant Propagules of Superior Genetic Makeup**																						
B.1	**In-Situ Seed Sources:** Identification, Mapping, Improvement and Management of Seed Production Areas (SPAs), Seed Stands (SSs), Candidate Plus Trees (CPTs) and old growth trees				-		-		-		-		-		-		-		-		-	-	-
B.1.1	Publication of a Notice in local Dailies to invite information on natural forests, tree stands and individual trees of prioritised species having superior morphological/ phenotypic characters	Nos.	20,000	5	1.000		-		-		-		-		-		-		-		-	5	1.000
	Engagement of Field Surveyor cum Technical Assistant to survey, shortlist, assess and evaluate areas and individual trees which may be designated and developed as SPA, SS and CPT of prioritised species and Heritage/Old Growth threes, select the areas and indididual trees which may be designated as SPA, SS, CPT and Heritage/Old Growth Tree and prepare detailed description and a map/geo-coordinate of each SPA, SS, CPT and Heritage/Old Growth Tree by using GPS (two in each of the three regions of the State)	Person Month	25,000	36	9.000	72	18.000		-		-		-		-		-		-		-	108	27.000
B.1.3	Organisation of training for Field Surveyor cum Technical Assistants and officials of the Forest and Environment Department on survey, shortling, assesment and evaluation of areas and individual trees which may be designated and developed as SPA, SS and CPT of prioritised species and Heritage/Old Growth trees and preparation of detailed description and a map/geo-coordinate of each SPA, SS, CPT and Heritage/Old Growth Tree by using GPS	No. of Persons	10,000	25	2.500		-		-		-		-		-		-		-		-	25	2.500
B.1.4	Culling and removal of inferior quality trees available in areas designated as SPAs and SSs	Hectare	5,000	100	5.000	200	10.000		-		-		-		-		-		-		-	300	15.000
B.1.5	Improving health of SPAs and SSs by undertaking Silviculture Operations such as climber cutting, removal of weeds and non-prioritised species *etc.* affecting growth of prioritised species and soil and moisture conservation works	Hectare	20,000	100	20.000	200	40.000		-		-		-		-		-		-		-	300	60.000

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
B.1.6	Travel expenses on tours to be undertaken by Field Surveyors cum Technical Assistants and officials of Forests and Environment Department in connection with identification, delineation and mapping of SPAs, SSs and CPTs	Person Month	20,000	36	7.200	72	14.400		-		-		-		-		-		-		-	108	21.600
B.2	**Ex-Situ Seed Sources:** Establishment of Clonal Seed Orchard (CSO), Seedling Seed Orchards (SSO), CSO cum Progeny Trials (PT), SSO cum PT, Vegetative Multiplication Garden (VMG)																						
B.2.1	Obtaining permissions from organizations/ firms/persons having Certified Clones and Plus Trees of prioritized species to obtain propagules of these clones and plus trees free of cost, wherever possible.	Nos.	-		-		-		-		-		-		-		-		-		-	-	-
B.2.2	Procurement of license to utilize seeds and other propagules of certified clones and plus trees of Priority Species	Nos.	2,00,000	5	10.000	2	4.000	2	4.000		-		-		-		-		-		-	9	18.000
B.2.3	Collection of seeds, cuttings and other propagules of certified clones, plus trees and candidate plus trees for raising seedlings, rooted cuttings and tissue cultured plants for planting in the ex-situ plantation sites.	Lump-Sum		L.S	0.500	L.S.	0.500	L.S.	0.500	L.S.	0.500		-		-		-		-		-	L.S.	2.000
B.2.4	Raising of seedlings, rooted cuttings and tissue cultured plants of priority species by utilizing propagules sourced from certified clones, plus trees and candidate plus trees by undertaking following activities:																						
B.2.4.1	Preparation of a mother bed by 30 cm deep digging of soil, breaking of clods, removal of debris/ stones/ pebbles, allowing the soil to weather for about fifteen days, mixing of farmyard manure, chemical fertilizer and pesticide , leveling and compacting of top surface and dressing of sides	No. of Beds	395	3.00	0.012	6.48	0.026	6.72	0.027	1.82	0.007	1.25	0.005	0.67	0.003	0.22	0.001	-	-	-	-	20.16	0.080
B.2.4.2	Preparation of a new nursery bed for poly bags on a plain earthen surface by digging of soil, clearance of debris/stones/pebbles, leveling compacting and dressing of sides and providing all along its periphery a 30 cm high bamboo barrier	No. of Beds	1,580	30	0.474	64.80	1.024	67.20	1.062	18.24	0.288	12.48	0.197	6.72	0.106	2.16	0.034	-	-	-	-	201.60	3.185
B.2.4.3	Pre-sowing Treatment of Seeds	No. of Beds	39.50	30.00	0.012	64.80	0.026	67.20	0.027	18.24	0.007	12.48	0.005	6.72	0.003	2.16	0.001	-	-	-	-	201.60	0.080
B.2.4.4	Sowing of seeds in a mother bed by evenly spraying of seeds on surface of the bed, mixing of seeds with soil and covering of bed with grass/straw excluding the cost of seeds but including the cost of straw/husk	No. of Beds	39.50	3	0.001	6.48	0.003	6.72	0.003	1.824	0.001	1.248	0.000	0.672	0.000	0.216	0.000		-		-	20.16	0.008
B.2.4.5	Procurement of Polythene Bags of the size 12.50 cm x 22.50 cm	Kg	750	30.00	0.225	64.80	0.486	67.20	0.504	18.24	0.137	12.48	0.094	6.72	0.050	2.16	0.016	-	-	-	-	201.60	1.512
B.2.4.6	Procurement of following ingredients for preparation of potting media including the cost of loading, unloading and transportation up to nursery site:																						

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
B.2.4.6.1	Farm Yard Manure	No. of Beds	750	30.00	0.225	64.80	0.486	67.20	0.504	18.24	0.137	12.48	0.094	6.72	0.050	2.16	0.016	-	-	-	-	201.60	1.512
B.2.4.6.2	Sand	No. of Beds	250	30.00	0.075	64.80	0.162	67.20	0.168	18.24	0.046	12.48	0.031	6.72	0.017	2.16	0.005	-	-	-	-	201.60	0.504
B.2.4.6.3	Ordinary Soil	No. of Beds	100	30.00	0.030	64.80	0.065	67.20	0.067	18.24	0.018	12.48	0.012	6.72	0.007	2.16	0.002	-	-	-	-	201.60	0.202
B.2.4.7	Preparation of potting media by mixing of compost, FYM, sand, clay and ordinary soil; filling and placing the poly bags in an orderly manner in the nursery bed including mixing of pesticide, PGPR, chemical fertilizer etc. but excluding the cost of compost, FYM, sand, ordinary soil, clay, PGPR, chemical fertilizer, chemical pesticides etc.:	No. of Beds	3,950	30.00	1.185	64.80	2.560	67.20	2.654	18.24	0.720	12.48	0.493	6.72	0.265	2.16	0.085	-	-	-	-	201.60	7.963
B.2.4.8	Transplanting of seedlings from mother bed to polythene bags	No. of Beds	39.5	30.00	0.012	64.80	0.026	67.20	0.027	18.24	0.007	12.48	0.005	6.72	0.003	2.16	0.001	-	-	-	-	201.60	0.080
B.2.4.9	Provision of shade for nursery beds consisting of bamboo posts and agronet roof covering fixed on bamboo structure excluding the cost of posts, agronet *etc.*	No. of Beds	895	30.00	0.269	64.80	0.580	67.20	0.601	18.24	0.163	12.48	0.112	6.72	0.060	2.16	0.019	-	-	-	-	201.60	1.804
B.2.4.10	Watering of polybag plants in nursery - daily on each non-rainy days	No. of Beds	395	30.00	0.119	64.80	0.256	67.20	0.265	18.24	0.072	12.48	0.049	6.72	0.027	2.16	0.009	-	-	-	-	201.60	0.796
B.2.4.11	Weeding of polybag plants in nursery	Per weeding per bed	39.50	270	0.107	583.20	0.230	604.80	0.239	164.16	0.065	112.32	0.044	60.48	0.024	19.44	0.008	-	-	-	-	1,814.40	0.717
B.2.4.12	Shifting and grading of plants	Per shifting per Bed	198	150	0.296	324	0.640	336	0.664	91	0.180	62	0.123	34	0.066	11	0.021	-	-	-	-	1,008.00	1.991
B.2.4.13	Spray of insecticides, pesticides fertilizers *etc.* by using a back mounted Knapsack or a machine operated pump	Per Spray Per Bed	3.95	150	0.006	324	0.013	336	0.013	91	0.004	62	0.002	34	0.001	11	0.000	-	-	-	-	1,008.00	0.040
B.2.4.13	Engagement of a Nursery Chowkidar	Person Month	11,850	18	2.133	24	2.844	24	2.844	12	1.422	12	1.422	12	1.422	12	1.422						
B.2.4.14	Purchase of tools, equipment, machineries *etc.*	Lump-Sum		L.S.	0.500	L.S.	0.500		-		-		-		-		-		-		-		1.000
B.3	**Site Development and Preparatory Activities for Planting at Ex-situ Seed Production Areas**				-				-		-		-		-		-		-		-	-	-
B.3.1	Chain link fencing of two out of four sites identified for establishment of *ex-situ* seed source	Running Meters	4,500	3,695	166.275	1,450	65.250	2,300	103.500		-		-		-		-		-		-	7,445	335.025
B.3.2	Supply and installation of Signboards contain the layout and details of species planted at *ex-situ* seed production areas	No	40,000	2	0.800	1	0.400	3	1.200		-		-		-		-		-		-	6	2.400
B.3.3	Construction of site office cum RCC Post, RCC Roof Office Building cum temporary seed storage having 40 sqm plinth area	Sqm. Plinth Area	30,000	80	24.000	40	12.000	120	36.000		-		-		-		-		-		-	240	72.000
B.3.4	Construction of seed extraction cum pre-storage processing centre consisting of MS Posts MS Angle Iron Superstructure, GI sheet roof and PCC floor having 60 sqm plinth area	Sqm. Plinth Area	10,000		-		-		-	-	-	120	12.000	60	6.000	180	18.000		-		-	360	36.000
B.3.5	Site clearance by cutting, removal and disposal/burning of existing vegetation in non-pine sites				-		-		-		-		-		-		-		-		-	-	-
B.3.5.1	Non-pine areas	Hectare	11,850	10.00	1.185	20.00	2.370	17.00	2.015		-		-		-		-		-		-	47	5.570
B.3.5.2	Pine areas	Hectare	3,950	2.50	0.099	5.00	0.198	5.50	0.217		-		-		-		-		-		-	13	0.514

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
B.3.6	Identification and marking of the pit location by erecting a wooden peg at each pit location, including cost of pegs	Per Plant	8.950	20,000	1.790	40,000	3.580	36,000	3.222		-		-		-		-		-		-	96,000	8.592
B.3.7	Digging of 90 cm dia and 90 cm deep cylindrical pits by using tractor mounted augur	Number of Pit	79.0	20,000	15.800	40,000	31.600	36,000	28.440	-	-	-		-			-		-		-	96,000	75.840
B.3.8	Procurement of tools, implements and equipments	No. of sites	10,000	2	0.200	1	0.100	3	0.300	-	-	-	-	-	-		-		-		-	6	0.600
B.4.1	**Safety and Security of Sites**																-		-		-	-	-
B.4	Engagement of Chowkidar cum Fire Watcher cum Fire Line Cleaners (2 persons at ex-situ site located at Darugre and one person at each of the remianing five sites)	Person Month	11,850	18	2.133	42	4.977	66	7.821	84.00	9.954	84.00	9.954	84.00	9.954	84.00	9.954	84.00	9.954	84.00	9.954	630	74.655
B.4	**Planting and First Year Maintenance**																						
B.4.1	Transportation of seedlings, rooted cuttings and tissue cultured plants from nurseries to temporary on-site temporary cum acclimatization facilities established within the ex-situ seed production sites	No. of plants	2	-	-	20,000	0.400	40,000	0.800	36,000	0.720	-	-	-	-		-		-		-	96,000	1.920
B.4.2	Planting of seedlings, rooted cuttings and tissue cultured plants of superior genetic makeup	No. of plants	7 9/10	-	-	20,000	1.580	40,000	3.160	36,000	2.844	-	-		-		-		-		-	96,000	7.584
B.4.3	Weeding, five times in non-pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per-hectare Per weeding	7,900	-	-	10.00	0.790	20.00	1.580	17.00	1.343		-		-		-		-		-	47	3.713
B.4.4	Weeding, 3 times in pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per hectare per weeding	3,950	-	-	2.50	0.099	5.00	0.198	5.50	0.217		-		-		-		-		-	13	0.514
B.4.5	Vacancy filling to replace the plants which have died and the inferior quality plants have been culled to ensure genetic superiority of the stock.				-		-		-		-		-		-		-		-		-	-	-
8.4.5.1	Re-digging of pits	No. of Pits	59.25	-	-	5,000	2.963	10,000	5.925	9,000	5.333		-		-		-		-		-	24,000	14.220
8.4.5.2	Transportation of seedlings, rooted cuttings and tissue cultured plants from nurseries to ex-situ seed production sites	No. of Plants	2	-	-	5,000	0.100	10,000	0.200	9,000	0.180		-		-		-		-		-	24,000	0.480
B.4.5.3	Planting of seedlings, rooted cuttings and tissue cultured plants of superior genetic makeup including refilling of pit and making a mound around the stem of the freshly planted seedling or rooted cutting or tissue cultured plant	No. of Plants	79.00	-	-	5,000	3.950	10,000	7.900	9,000	7.110		-		-		-		-		-	24,000	18.960
B.4.6	Soil and moisture conservation such as contruction of contour trenches, constrction of check dams etc.	Per ha.	50,000	12.50	6.250	25.00	12.500	22.50	11.250	-	-		-		-		-		-		-	60	30.000

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
B.4.7	Watering of plants once a month during each of five dry winter months	Per watering per plant	5.00	1,00,000	5.000	2,00,000	10.000	1,80,000	9.000		-		-		-		-		-		-	4,80,000	24.000
B.4.8	Preparation of fire lines by uprooting, cutting and removal/burning of all existing vegetation	Per Ha.	7,900	-	-	12.50	0.988	25	1.975	22.50	1.778		-		-		-		-		-	60	4.740
B.5	**Second Year Maintenance**																						
B.5.1	Weeding, 5 times in non-pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants, cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites and placing all freshly cut vegetative materials around the stem of seedlings for mulching	Per weeding per hectare	7,900		-		-	10.00	0.790	20.00	1.580	17.00	1.343		-		-		-		-	47	3.713
B.5.2	Weeding, 3 times in pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants, cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites and placing all freshly cut vegetative materials around the stem of seedlings for mulching	Per weeding per hectare	3,950					2.50	0.099	5.00	0.198	5.50	0.217		-		-		-		-	13	0.514
B.5.3	Vacancy filling to replace the plants which have died and the inferior quality plants have been culled to ensure genetic superiority of the stock.				-		-		-		-		-		-		-		-		-	-	-
B.5.3.1	Re-digging of pits	No. of Pits	59.25		-		-	4,000	2.370	8,000	4.740	7,200	4.266		-		-		-		-	19,200	11.376
B.5.3.2	Transportation of seedlings, rooted cuttings and tissue cultured plants from nurseries to ex-situ seed production sites	No. of Plants	2		-		-	4,000	0.080	8,000	0.160	7,200	0.144		-		-		-		-	19,200	0.384
B.5.3.3	Planting of seedlings, rooted cuttings and tissue cultured plants of superior genetic makeup	No. of Plants	7.90		-		-	4,000	0.316	8,000	0.632	7,200	0.569		-		-		-		-	19,200	1.517
B.5.6	Watering of plants once a month during each of five dry winter months	Per watering per plant	5.00	1,00,000	5.000	2,00,000	10.000	1,80,000	9.000		-		-		-		-		-		-	4,80,000	24.000
B.5.7	Periodic cleaning of fire lines by uprooting, cutting and removal/burning of all existing vegetation	Per hectare	3,950		-		-	12.50	0.494	25.00	0.988	22.50	0.889		-		-		-		-	60	2.370
B.6	**Third Year Maintenance**																						
B.6.1	Weeding, 4 times in non-pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	7,900		-		-		-	10.00	0.790	20.00	1.580	17.00	1.343		-		-		-	47	3.713
B.6.2	Weeding, 2 times in pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	3,950							2.50	0.099	5.00	0.198	5.50	0.217		-		-		-	13	0.514
B.6.3	Vacancy filling to replace the plants which have died and the inferior quality plants have been culled to ensure genetic superiority of the stock.				-		-		-		-		-		-		-		-		-	-	-

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
B.6.3.1	Re-digging of pits	No. of Pits	59.25		-		-		-	3,000	1.778	6,000	3.555	5,400	3.200	-	-	-	-	-	-	14,400	8.532
B.6.3.2	Transportation of seedlings, rooted cuttings and tissue cultured plants from nurseries to ex-situ seed production sites	No. of Plants	2		-		-		-	3,000	0.060	6,000	0.120	5,400	0.108	-	-	-	-	-	-	14,400	0.288
B.6.3.3	Planting of seedlings, rooted cuttings and tissue cultured plants of superior genetic makeup	No. of Plants	7.90		-		-		-	3,000	0.237	6,000	0.474	5,400	0.427	-	-	-	-	-	-	14,400	1.138
B.6.4	Watering of plants once a month during each of five dry winter months	Per watering per plant	5.00	1,00,000	5.000	2,00,000	10.000	1,80,000	9.000		-		-		-		-		-		-	4,80,000	24.000
B.6.5	Periodic cleaning of fire lines by uprooting, cutting and removal/ burning of all existing vegetation	Per Hectare	3,950		-		-		-	12.50	0.494	25.00	0.988	22.50	0.889	-	-	-	-	-	-	60	2.370
B.7	**Fourth Year Maintenance**																						
B.7.1	Weeding, 4 times in non-pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	7,900		-		-		-		-	10.00	0.790	20.00	1.580	17.00	1.343	-	-	-	-	47	3.713
B.7.2	Weeding, 3 times in pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	3,950									2.50	0.099	5.00	0.198	5.50	0.217	-	-	-	-	13	0.514
B.7.3	Vacancy filling to replace the plants which have died and the inferior quality plants have been culled to ensure genetic superiority of the stock.				-		-		-		-		-		-		-		-		-	-	-
B.7.3.1	Re-digging of pits	No. of Pits	59.25		-		-		-		-	2,000	1.185	4,000	2.370	3,600	2.133	-	-	-	-	9,600	5.688
B.7.3.2	Transportation of seedlings, rooted cuttings and tissue cultured plants from nurseries to ex-situ seed production sites	No. of Plants	2		-		-		-		-	2,000	0.040	4,000	0.080	3,600	0.072	-	-	-	-	9,600	0.192
B.7.3.3	Planting of seedlings, rooted cuttings and tissue cultured plants of superior genetic makeup	No. of Plants	7.90		-		-		-		-	2,000	0.158	4,000	0.316	3,600	0.284	-	-	-	-	9,600	0.758
B.7.4	Periodic cleaning of fire lines by uprooting, cutting and removal/burning of all existing vegetation	Running Meters	3,950		-		-		-		-	12.50	0.494	25.00	0.988	22.50	0.889	-	-	-	-	60	2.370
B.8	**Fifth Year Maintenance**																						
B.8.1	Weeding, 4 times in non-pine sites and 3 times in pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	7,900		-		-		-		-		-	10.00	0.790	20.00	1.580	17.00	1.343	-	-	47	3.713

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
B.8.2	Weeding, 2 times in pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	3,950										-	2.50	0.099	5.00	0.198	5.50	0.217	-	-	13	0.514
B.8.3	Vacancy filling to replace the plants which have died and the inferior quality plants have been culled to ensure genetic superiority of the stock.				-		-		-		-		-		-		-		-		-	-	-
B.8.3.1	Re-digging of pits	No. of Pits	59.25		-		-		-		-		-	1,000	0.593	2,000	1.185	1,800	1.067	-	-	4,800	2.844
B.8.3.2	Transportation of seedlings, rooted cuttings and tissue cultured plants from nurseries to ex-situ seed production sites	No. of Plants	2		-		-		-		-		-	1,000	0.020	2,000	0.040	1,800	0.036	-	-	4,800	0.096
B.8.3.3	Planting of seedlings, rooted cuttings and tissue cultured plants of superior genetic makeup	No. of Plants	7.90		-		-		-		-		-	1,000	0.079	2,000	0.158	1,800	0.142	-	-	4,800	0.379
B.8.4	Periodic cleaning of fire lines by uprooting, cutting and removal/burning of all existing vegetation	Running Meters	3,950		-		-		-		-		-	12.50	0.494	25.00	0.988	22.50	0.889	-	-	60	2.370
B.9	**Sixth Year Maintenance**																						
B.9.1	Weeding, 2 times in non-pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	7,900		-		-		-		-		-		-	10.00	0.790	20.00	1.580	17.00	1.343	47	3.713
B.9.2	Weeding, 1 time in pine sites by uprooting or cutting of all herbs and woody plants growing in 1 m radius from each plants and cutting/uprooting of all woody plants growing in remaining area of the ex-situ seed production sites	Per weeding per hectare	3,950										-		-	2.50	0.099	5.00	0.198	5.50	0.217	13	0.514
B.9.4	Periodic cleaning of fire lines by uprooting, cutting and removal/burning of all existing vegetation	Running Meters	3,950		-		-		-		-		-		-	12.50	0.494	25.00	0.988	22.50	0.889	60	2.370
Sub-Total for 'B'					**294.411**		**270.668**		**261.019**		**45.007**		**41.751**		**31.847**		**40.064**		**16.413**		**12.403**		**1,000.073**
C.	**Standardization of Collection, Extraction, Drying and Pre-Storage Treatment of Seeds of Prioritised Species**																						
C.1	Engagement of Technical Assistant	Person Month	25,000	6	1.500	12	3.000	6	1.500		-		-		-		-		-		-	24	6.000
C.2	Travel expenses on tours to be undertaken by Technical Assistants and officials of the Forest and Environment Department in connection with standardization of seed collection, extraction, drying and pre-storage techniques	Per Person per month	25,000	6	1.500	12	3.000	6	1.500		-		-		-		-		-		-	24	6.000
C.3	Procurement of tools, implements, equipments, consumables and other miscellaneous items	Lump-sum		L.S.	1.500	L.S.	0.500	L.S.	0.500		-		-		-		-		-		-		2.500
Sub-Total for 'C'					**4.500**		**6.500**		**3.500**		-		-		-		-		-		-		**14.500**
D.	**Establishment of Seed Storage Facility**																						
D.1	**Long-Term Storage**																						

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
D.1.1	Engagement of Field Surveyor cum Technical Assistant to collect seeds of all seed bearing plants in Meghalaya for depositing the same with National Bureau of plant Genetic Resources (NBPGR) for long term storage with an understanding to provide a part thereof to the State as and when the same is required by the Department	Person Month	25,000	18.00	4.500	36.00	9.000	18.00	4.500		-		-		-		-		-		-	72	18.000
D.1.2	Travel expenses on tours to be undertaken by Field Surveyors cum Technical Assistants and officials of the Forest and Environment Department in connection with collection and depositing with NBPGR the seeds of all seed bearing plants in Meghalaya	Per-Person Per Month	20,000	18.00	3.600	36.00	7.200	18.00	3.600													72	14.400
D.1.3	Miscellaneous expenses on collection, extraction, drying, pre-storage processing and depositing the seeds	Lump-sum			2.000		2.000		2.000		-		-		-		-		-		-	-	6.000
D.2	**Medium Term and Working Storage Facility**						-		-														
D.2.1	Construction of a RCC Frame, RCC Roof type Seed Storage Building at Upper Shillong	Sqm. Plinth Area	30,000	250.00	75.000		-		-				-		-		-		-		-	250.00	75.000
D.2.2	Capital cost of plants, equipment and machineries as per specifications given in **Annexure-I**	As per details given in Annexure-I			550.000		-		-		-		-		-		-		-		-	-	550.000
D.2.3	Engagement of skilled Technician cum Operator to manage the Seed Storage Facility	Person Month	25,000	-	-	24	6.000	24	6.000	24	6.000	24	6.000	24	6.000	24	6.000	24	6.000	24	6.000	192	48.000
D.2.4	Engagement of a Helper cum Cleaner to assist the skilled Technician cum Operator and also to ensure general upkeep of the facility	Person Month	11,850	-	-	12	1.422	12	1.422	12	1.422	12	1.422	12	1.422	12	1.422	12	1.422	12	1.422	96	11.376
D.2.5	Payment of monthly Electricity Bills	Per month	30,000	-	-	12	3.600	12	3.600	12	3.600	12	3.600	12	3.600	12	3.600	12	3.600	12	3.600	96	28.800
Sub-Total for 'D'					**550.000**		**11.022**		**11.022**		**11.022**		**11.022**		**11.022**		**11.022**		**11.022**		**11.022**		**638.176**
E.	**Purchase of Seed Testing Equipment**																						
E.1	Moisture Bottles (small and big)	Nos.	400	100	0.400		-		-		-		-		-		-		-		-	100	0.400
E.2	Mortar Pestle	Nos.	400	20	0.080		-		-		-		-		-		-		-		-	20	0.080
E.3	Metal Trays	Nos.	800	20	0.160		-		-		-		-		-		-		-		-	20	0.160
E.4	Hot Air Oven	Nos.	35,000	2	0.700		-		-		-		-		-		-		-		-	2	0.700
E.5	Self indicating silica gel	Kg	600	20	0.120		-		-		-		-		-		-		-		-	20	0.120
E.6	Airtight containers	Nos.	400	100	0.400		-		-		-		-		-		-		-		-	100	0.400
E.7	Glass Petri-plates	Nos.	200	200	0.400		-		-		-		-		-		-		-		-	200	0.400
E.8	Weighing Balance	Nos.	1,50,000	2	3.000		-		-		-		-		-		-		-		-	2	3.000
E.9	Laboratory Mixer Grinder	Nos.	3,000	2	0.060		-		-		-		-		-		-		-		-	2	0.060
E.10	Sealing Machine	Nos.	4,00,000	2	8.000		-		-		-		-		-		-		-		-	2	8.000
E.11	Scissors	Nos.	100	10	0.010		-		-		-		-		-		-		-		-	10	0.010
E.12	Tissue rolls	Nos.	50	20	0.010		-		-		-		-		-		-		-		-	20	0.010
E.13	Stapler	Nos.	200	20	0.040		-		-		-		-		-		-		-		-	20	0.040
E.14	Stapler pins	Packets	50	20	0.010		-		-		-		-		-		-		-		-	20	0.010
E.15	Calculator	Nos.	1,000	2	0.020		-		-		-		-		-		-		-		-	2	0.020
E.16	Laboratory Note Book	Nos.	100	20	0.020		-		-		-		-		-		-		-		-	20	0.020
E.17	Large Scales	Nos.	20	20	0.004		-		-		-		-		-		-		-		-	20	0.004
E.18	Spatula	Nos.	100	20	0.020		-		-		-		-		-		-		-		-	20	0.020

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
E.19	Markers	Nos.	50	50	0.025		-		-		-		-		-		-		-		-	50	0.025
E.20	Desiccators	Nos.	5,000	10	0.500		-		-		-		-		-		-		-		-	10	0.500
E.21	Gloves	Boxes	1,000	20	0.200		-		-		-		-		-		-		-		-	20	0.200
E.22	Seed Germinators	No.	2,00,000	4	8.000		-		-		-		-		-		-		-		-	4	8.000
E.23	Germination Towel Papers (Size 18 inch x 12 inch)	Kg	500	20	0.100		-		-		-		-		-		-		-		-	20	0.100
E.24	Wax or Butter Papers (size 20 inch x 15 inch)	Kg	500	20	0.100		-		-		-		-		-		-		-		-	20	0.100
E.25	Petri-dishes (11 cm)	Nos.	150	50	0.075		-		-		-		-		-		-		-		-	50	0.075
E.26	Filter paper round (11 cm)	Pack	250	50	0.125		-		-		-		-		-		-		-		-	50	0.125
E.27	Distilled water bottles (wash bottles)	Nos.	400	100	0.400		-		-		-		-		-		-		-		-	100	0.400
E.28	Plastic Trays	Nos.	500	50	0.250		-		-		-		-		-		-		-		-	50	0.250
E.29	Alkathene (polythene) Bags	Kg	500	50	0.250		-		-		-		-		-		-		-		-	50	0.250
E.30	Rubber bands	Kg	200	5	0.010		-		-		-		-		-		-		-		-	5	0.010
E.31	TTZ (2,3,5- Triphenyltetrazolium chloride)	Kg	30,000	5	1.500		-		-		-		-		-		-		-		-	5	1.500
E.32	Beakers (25 and 50 ml)	Nos.	200	100	0.200		-		-		-		-		-		-		-		-	100	0.200
E.33	Measuring cylinder	Nos.	500	8	0.040		-		-		-		-		-		-		-		-	8	0.040
E.34	Aluminum Foil packets tri-layered	Nos.	75	20	0.015		-		-		-		-		-		-		-		-	20	0.015
E.35	Muslin bags	Nos.	75	500	0.375		-		-		-		-		-		-		-		-	500	0.375
E.36	Double Distilation Unit	Nos.	70,000	2	1.400		-		-		-		-		-		-		-		-	2	1.400
E.37	BoD Incubator	Nos.	90,000	2	1.800		-		-		-		-		-		-		-		-	2	1.800
E.38	Spectrophotometer	Nos.	3,20,000	2	6.400		-		-		-		-		-		-		-		-	2	6.400
E.39	Moisture Meter	Nos.	45,000	4	1.800		-		-		-		-		-		-		-		-	4	1.800
E.40	EC Meter	Nos.	25,000	4	1.000		-		-		-		-		-		-		-		-	4	1.000
E.41	pH Meter	Nos.	40,000	4	1.600		-		-		-		-		-		-		-		-	4	1.600
E.42	Plastic Baskets	Nos.	200	200	0.400		-		-		-		-		-		-		-		-	200	0.400
Sub-Total for 'E'					**40.019**		-		-		-		-		-		-		-		-		**40.019**
F.	**Timely Collection, Extraction, Pre-Sowing Treatment & Testing and Sowing the Seeds of Recalcitrant Species**																						
F.1	Engagement of Field Assistant to collect, extract, process, treat and sow the seeds of recalcitrant immediately after they are available for collection and supply of such seeds to nurseries of the Department for sowing to raising of seedlings	Person Month	11,850	12	1.422	12	1.422	12	1.422	24	2.844	24	2.844	24	2.844	24	2.844	24	2.844	24	2.844	180	21.330
F.2	Expenditure on travel and transportation of seeds and seedlings and wildlings of recalcitrant species	Lump-Sum	Lump-sum	-	1.000		1.000		1.000		2.000		2.000		2.000		2.000		2.000		2.000	-	15.000
Sub-Total for 'F'					**2.422**		**2.422**		**2.422**		**4.844**		**4.844**		**4.844**		**4.844**		**4.844**		**4.844**		**36.330**
G.	**Capacity Building of Persons Involved in Seed Collection, Extraction, Drying, Pre-Storage Treatment, Storage and Testing**																						
G.1	Engagement of expert to prepare manuscripts of Seed Manual and Handbooks, Script and Storyline of Informative Videos and contents and design of leaflets, posters and other IEC materials in English	Person Month	50,000	12.00	6.000	24.00	12.000		-		-		-		-		-		-		-	36	18.000
G.2	Printing of 500 copies of Seed Manual containing details of each activity involved in collection, extraction, drying, pre-storage treatment, storage and testing of seeds of prioritized species in a simple and easy to understand language	Number of copies	500	-	-	500	2.500		-		-		-		-		-		-		-	500	2.500

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
G.3	Translation of Seed Manual in Garo, Khasi and Jaintia languages	Per Language	50,000		-	3.00	1.500		-		-		-		-		-		-		-	3	1.500
G.4	Printing of Seed Manual in Khasi, Jaintia and Garo (100 copies in each language)	Number of copies	500		-	300.00	1.500		-		-		-		-		-		-		-	300	1.500
G.5	Printing of 100 copies of Handbook for each of the 50 prioritised species covering details of each activity involved in collection, extraction, drying, pre-storage treatment, storage and testing in English	Number of copies	200		-	5,000.00	10.000		-		-		-		-		-		-		-	5,000	10.000
G.6	Translation of Handbooks in Garo, Khasi and Jaintia languages	Per Handbook Per Language	10,000		-	150	15.000		-		-		-		-		-		-		-	150	15.000
G.7	Printing of Handbooks for each of the 50 prioritised species in Khasi, Jaintia and Garo (100 copies in each language)	Number of copies	200		-	15,000	30.000		-		-		-		-		-		-		-	15,000	30.000
G.8	Preparation of Informative Videos containing details of each activity involved in collection, extraction, drying, pre-storage treatment, storage and testing for each prioritised species	No. of Video	6,00,000		-	1	6.000		-		-		-		-		-		-		-	1	6.000
G.9	Preparing DVDs containing Video on Seed in English	No. of CDs	100		-	500	0.500		-		-		-		-		-		-		-	500	0.500
G.10	Dubbing of the above informative Video in Khasi, Jaintia and Garo Languages	No. of Languages	50,000		-	3	1.500		-		-		-		-		-		-		-	3	1.500
G.11	Printing of Posters in English (200 numbers for each of the 50 prioritised species)	No. of Posters	25		-	10,000	2.500		-		-		-		-		-		-		-	10,000	2.500
G.12	Printing of Leaflets in English (200 numbers for each of the 50 prioritised species)	No. of Leaflets	25			10,000	2.500										-		-		-	10,000	2.500
G.13	Translation of Posters and Leaflets in Khasi, Jaintia and Garo Languages	Per Language per poster/ leaflet	500		-	300	1.500		-		-		-		-		-		-		-	300	1.500
G.14	Printing of Posters in Khasi, Jaintia and Garo Languages (100 for each of the prioritised species in each of the 3 languages)	No.	25		-	15,000	3.750		-		-		-		-		-		-		-	15,000	3.750
G.15	Printing of Leaflets in Khasi, Jaintia and Garo Languages (100 for each of the prioritised species in each of the 3 languages)	No.	25		-	15,000	3.750		-		-		-		-		-		-		-	15,000	3.750
G.16	Organization of Trainings for officials of Forest and Environment Department and various other Departments, Agencies and Organisations involved in afforestation works on various aspects of collection, extraction, processing, storage, drying, pre-sowing treatment and testing of seeds of prioritised species	No. of participants	2,000	-	-	50	1.000	100	2.000	100	2.000	100	2.000	100	2.000	100	2.000	100	2.000	100	2.000	750	15.000
Sub-Total for 'G'						**6.000**		**95.500**		**2.000**		**2.000**		**2.000**		**2.000**		**2.000**		**2.000**		**2.000**		**115.500**

Sl. No.	Item of Work	Unit	Rate (Rs. per unit)	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Sixth Year		Seventh Year		Eighths Year		Ninth Year		Total	
				Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)	Qty.	Amt. (Rs. in lakh)
H.	Establishment of a Project Monitoring Unit (PMU) in office of the Principal Chief Conservator of Forests (Working Plan, Research & Training and District Council Affairs) to assist him in planning and monitoring the progress in implementation various activities undertaken under the Project																						
H.1	Engagement of a Technical Assistant on contract basis	Person Month	25,000	6	1.500	12	3.000	12	3.000	12	3.000	12	3.000	12	3.000	12	3.000	12	3.000	12	3.000	102	**25.500**
H.2	Purchase of equipment, accessories, furniture, consumable etc.	Lump-sum		Lump-Sum	5.000	Lump-Sum	2.500	Lump-Sum	2.000	Lump-Sum	2.500	Lump-Sum	2.500	Lump-Sum	2.500	Lump-Sum	2.500	Lump-Sum	2.500	Lump-Sum	2.500	Lump-Sum	24.500
Sub-Total for 'H'					**6.500**		**5.500**		**5.000**		**5.500**		**5.500**		**5.500**		**5.500**		**5.500**		**5.500**		**50.000**
I.	**Miscellaneous and Unforeseen Expenses**																						
I	Miscellaneous and unforeseen expenses including cost escalation due to increase in minimum wage rates notified by the Labour Department from time to time	Lump-sum			45.000		25.000		30.000		35.000		25.000		21.000		21.000		18.962		20.000	-	240.962
Sub-Total for 'I'					**40.000**		**35.000**		**30.000**		**30.000**		**35.000**		**25.000**		**25.000**		**20.000**		**20.000**		**240.962**
GRAND TOTAL (A+B+C+D+E+F+G+H+I)					**947.852**		**426.612**		**314.963**		**98.373**		**100.117**		**80.213**		**88.430**		**59.779**		**55.769**		**2,139.560**