

別添資料

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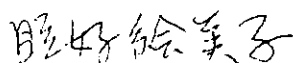
別添資料 9 収集資料リスト

MINUTES OF MEETING
BETWEEN THE PREPARATORY STUDY TEAM OF THE GOVERNMENT OF JAPAN
AND THE AUTHORITIES CONCERNED OF THE REPUBLIC OF INDIA
ON TECHNICAL COOPERATION
FOR THE PROJECT ON FOREST AND WATERSHED CONSERVATION
IN KERALA STATE, THE REPUBLIC OF INDIA

The preparatory study team of the Government of Japan (hereinafter referred to as 'the Team') on technical cooperation for the Project on Forest and Watershed Conservation in Kerala State in the Republic of India (hereinafter referred to as 'the Project'), organized by the Japan International Cooperation Agency (hereinafter referred to as 'JICA') headed by Ms. Emiko Mutsuyoshi, was dispatched to the Republic of India from 4 November to 30 November 2002. The purpose of the dispatch was to formulate the Project requested by the Government of India under the technical cooperation of the Government of Japan.

During its stay, the Team exchanged views through a series of discussions and field observations on the Project with the authorities concerned of Government of India and Government of Kerala.

As a result of the discussions, both parties reached common understandings concerning the matters referred in the documents attached hereto. Both parties will recommend them to their respective governments.



Ms. Emiko Mutsuyoshi
Leader
Preparatory Study Team
Japan International Cooperation
Agency (JICA)
Date: Trivandrum, 19 November 2002

Ministry of Environment and Forests
Government of India
Date: New Delhi, November 2002

Mr. E.K. Bharat Bhushan
Secretary
Forests and Wild Life Department
Government of Kerala
Date: Trivandrum, 19 November 2002



Dr. J.K. Sharma
Director
Kerala Forest Research Institute (KFRI)
(An organization under Science, Technology and
Environment Committee, Science, Technology and
Environment Department, Government of Kerala)
Date: Trivandrum, 19 November 2002

ATTACHMENT

1 . The Background and Basic Concept of the Project

The Department of Economic Affairs, the Government of India had forwarded a project proposal on “Rehabilitation of degraded Chalakudy Watershed of Kerala, India through Participatory Approach for Sustained Social and Economic Development and Environmental Conservation” submitted by the Kerala Forest Research Institute through the Government of Kerala and the Ministry of Environment and Forests, the Government of India to the Government of Japan for technical cooperation. The overall goal of the proposal was to rehabilitate the degraded forest as well as conserve the forests of the Western Ghats including rare, endangered and threatened (RET) tree species through participatory approach. In the project proposal, the overall goal was to have been achieved through the watershed management approach.

JICA Preparatory Study Team, after extensive field visits and discussions with the Kerala Forest Department officials and KFRI scientists, concluded that the Project may address more on the conservation aspect to achieve the above stated goal. Through the problem analysis workshop, both sides have reached a common understanding to address the conservation of rare, endangered and threatened species, some of which are already on the verge of extinction due to numerous biotic, biological, physical and social factors. There are more than 350 endemic forest tree species in the RET category about which information is not adequately available on biology and factors responsible for the endemism and restricted occurrence. It is important to study some of these species in their natural habitat, to identify their growing conditions, and to analyze the cause for their lack of regeneration. Hence, the proposal was modified with activities to carry out basic studies, to develop appropriate technologies for conservation of RET tree species, to extend the information to the field, and to create public awareness.

The project will contribute to conserve as well as increase the base population of some of the RET species of the Western Ghats forest ecosystem. The technology developed as the outcome of the Project will be useful to various stakeholders including Forest Department, farmers, NGOs, and other states of the Western Ghats region in conserving the RET tree species.

2 . The Draft Framework of the Project

Through the series of discussions and a workshop conducted on 13 and 14

November 2002, the Indian authorities and the Team reached to the common understanding on the draft framework of the Project.

2.1 Project Title

Conservation of rare, endangered, and threatened tree species in the Western Ghats forest ecosystem of Kerala

2.2 Executing Agency

Kerala Forest Research Institute (KFRI) and Kerala Forest Department (KFD) will be the executing agencies.

2.3 Project Locations

- 1) Project office and laboratory: KFRI, Peechi
- 2) Natural forests of Kerala
- 3) Project site for experimental /trial plots in the forests

2.4 Project Duration

5 years

2.5 Overall Goal

Conservation of forest ecosystem of the Western Ghats in Kerala is promoted.

2.6 Project Purpose

Conservation of rare, endangered and threatened (RET) tree species of the Western Ghats in Kerala is promoted.

2.7 Output

- 1) Information on potential of planting stocks of the selected RET tree species is enriched.
- 2) Ecophysiological characteristics of the selected RET tree species are identified.
- 3) Genetic diversity of the selected RET tree species is understood.
- 4) Utilization potential of the selected RET tree species is understood.
- 5) Technologies for *in situ* conservation of the selected RET tree species are developed.
- 6) Technologies for *ex situ* conservation of the selected RET tree species are developed.

- 7) Existing knowledge and techniques for introducing RET tree species in natural forest are applied in the field for their conservation and rehabilitation.
- 8) Public awareness on conservation of RET tree species is created.
- 9) Project results are disseminated locally, nationally and internationally.

3. Project Steering Committee

For the effective and successful implementation of the Project, a Project Steering Committee will be established to make decisions relevant to the Project. The primary functions of the committee are; 1) to monitor and evaluate the progress of the Project; and 2) to approve the annual plan and reports of the Project. The committee will be composed of the chair, members, and observers. The chair may co-opt experts or observers as special invitees in the interest of the implementation of the Project. The terms of reference of the committee will be determined at the beginning of the Project.

Possible composition:

Chair: Secretary, Forests and Wild Life Department, Government of Kerala

Members:

- Director General of Forests, Special Secretary, Ministry of Environment and Forests, Government of India
- Secretary, Science, Technology and Environmental Department, Government of Kerala
- Secretary, Planning and Economic Affairs Department, Government of Kerala
- Principal Chief Conservator of Forests, KFD
- Chief Conservator of Forests (Development), KFD
- Director, KFRI
- Research Coordinator, KFRI
- Project Coordinator, KFRI
- Resident Representative, JICA India Office
- Japanese Expert(s)

Observers:

- Official(s) from Embassy of Japan

4. Measures to Be Taken by Both the Governments

Both Governments will take necessary measures for implementing the project in

accordance with the established procedure for bilaterally assisted projects, the details of which will be incorporated in the Record of Discussions (R/D) to be exchanged in due course of time.

5. Two members of the Team will continue gathering information related to the formulation of the Project activities and institutional / organizational aspects of the Project until the 30th of November 2002.
6. Based on the results of the preparatory study team, the Government of Japan will further examine the justification of the Project in terms of impact, effectiveness, feasibility and urgency. The draft framework of the Project will be modified according to critical evaluation and availability of resources.

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インド中央政府：

環境森林省

<http://www.envfor.nic.in/>

プランニング・コミッション

<http://planningcommission.nic.in/>

ケララ州：

ケララ州政府

<http://www.kerala.gov.in/index.htm>

ケララ森林局

http://www.kerala.gov.in/dept_forest/organisation.htm

KFRI

<http://www.kfri.org/html/flashhome.htm>

国際機関

UNDP インド事務所

<http://www.undp.org.in/>

世界銀行

<http://www.worldbank.org/>

研究機関

インド森林研究・教育評議会 (ICFRE)

<http://www.icfre.org/>

森林遺伝学・育種研究所 (IFGTB)

<http://www.ifgtb.res.in/>

その他

YAHOO インディア

<http://in.yahoo.com/>

別添資料3 KFDの野生生物部の稀少・危惧樹種のリスト

凡例

RET: IUCN及びインド植物調査所(BSI)による希少樹種リスト

EN_WGKe: Pondichery フランス研究所による西ガーツ山脈に固有な樹種リスト

SN.	Family	Species	RET	EN_WGKe
1	Rubiaceae	<i>Acranthera grandiflora</i>	*	*
2		<i>Acrocephalus palniensis</i>	*	
3	Lauraceae	<i>Actinodaphne bourdillonii</i>		*
4	Lauraceae	<i>Actinodaphne boumeae</i>	*	
5	Lauraceae	<i>Actinodaphne lanata</i>	*	
6	Lauraceae	<i>Actinodaphne lawsonii</i>	*	*
7	Lauraceae	<i>Actinodaphne malabarica</i>		*
8	Lauraceae	<i>Actinodaphne salicina</i>		*
9	Lauraceae	<i>Actinodaphne tadulingamii</i>		*
10		<i>Adspiopterys (Aspidopteris) canarensis</i>	*	
11	Amaranthaceae	<i>Aerva wightii</i>	*	
12	Meliaceae	<i>Aglaiia barberi</i>		*
13	Meliaceae	<i>Aglaiia canarensis</i>		*
14	Meliaceae	<i>Aglaiia elaeagnoidea</i> var. <i>bourdillonii</i>		*
15	Meliaceae	<i>Aglaiia exstipulata</i>		*
16	Meliaceae	<i>Aglaiia indica</i>		*
17	Meliaceae	<i>Aglaiia jainii</i>		*
18	Meliaceae	<i>Aglaiia lawii</i>		*
19	Meliaceae	<i>Aglaiia maiae</i>		*
20	Meliaceae	<i>Aglaiia malabarica</i>		*
21	Meliaceae	<i>Aglaiia simplicifolia</i>		*
22	Meliaceae	<i>Aglaiia talbotii</i>	*	
23	Zingiberaceae	<i>Amomum microstephanum</i>	*	
24		<i>Anacolosa densiflora</i>		*
25		<i>Anaphalis barnesii</i>	*	
26		<i>Anisochilus argenteus</i>	*	
27		<i>Anisochilus wightii</i>	*	
28		<i>Anoectochilus rotundifolius</i>	*	
29		<i>Antistrophe serratifolia</i>	*	
30		<i>Apollonias amottii</i>		*
31		<i>Aponogeton appendiculatus</i>	*	
32		<i>Aporusa bourdillonii</i>		*
33		<i>Aralia malabarica</i>		*
34		<i>Ardisia amplexicaulis</i>		*
35		<i>Ardisia blatteri</i>		*
36		<i>Ardisia rhomboidea</i>		*
37		<i>Ardisia sonchifolia</i>		*
38		<i>Artocarpus hirsutus</i>		*
39		<i>Atalantia wightii</i>		*
40		<i>Atuna travancorica</i>	*	*
41		<i>Baccaurea courtallensis</i>		*
42		<i>Begonia aliciae</i>	*	
43		<i>Begonia anamalayana</i>	*	
44		<i>Begonia canarana</i>	*	
45		<i>Begonia cordifolia</i>	*	
46		<i>Begonia subpeltata</i>	*	
47		<i>Begonia trichocarpa</i>	*	
48		<i>Beilschmiedia wightii</i>		*
49		<i>Belosynapsis kewensis</i>	*	

50		<i>Belosynapsis vivipara</i>	*	
51		<i>Bentinckia condapanna</i>	*	*
52		<i>Berberis nilghiriensis</i>		*
53		<i>Blachia calycina</i>		*
54		<i>Blachia denudata</i>		*
55		<i>Blachia reflexa</i>		*
56		<i>Blachia umbellata</i>		*
57		<i>Blepharistemma membranifolia</i>		*
58		<i>Buchanania barberi</i>	*	*
59		<i>Buchanania lanceolata</i>		*
60		<i>Bulbophyllum acutiflorum</i>	*	
61		<i>Bulbophyllum albidum</i>	*	
62		<i>Bulbophyllum aureum</i>	*	
63		<i>Bulbophyllum elegantulum</i>	*	
64		<i>Bulbophyllum kaitiense</i>	*	
65		<i>Bunium nothum</i>	*	
66		<i>Calophyllum apetalum</i>		*
67		<i>Calophyllum austroindicum</i>		*
68		<i>Campanula alphonsii</i>	*	
69		<i>Canthium pergracilis</i>		*
70		<i>Canthium travancoricum</i>		*
71		<i>Capparis diversifolia</i>	*	
72		<i>Capparis fusifera</i>	*	
73		<i>Capparis rheedii</i>	*	
74		<i>Capparis shevaroyensis</i>	*	
75	Cyperaceae	<i>Carex christii</i>	*	
76	Cyperaceae	<i>Carex pseudoaperta</i>	*	
77	Cyperaceae	<i>Carex vicinalis</i>	*	
78	Flacourtiaceae	<i>Casearia rubescens</i>		*
79	Flacourtiaceae	<i>Casearia varians</i>		*
80	Flacourtiaceae	<i>Casearia wynaadensis</i>		*
81		<i>Cayratia pedata</i>	*	
82		<i>Cayratia roxburghii</i>	*	
83	Asclpiadaceae	<i>Ceropegia barnesii</i>	*	
84	Asclpiadaceae	<i>Ceropegia beddomei</i>	*	
85	Asclpiadaceae	<i>Ceropegia decaisneana</i>	*	
86	Asclpiadaceae	<i>Ceropegia fimbriifera</i>	*	
87	Asclpiadaceae	<i>Ceropegia maculata</i>	*	
88	Asclpiadaceae	<i>Ceropegia metziana</i>	*	
89	Asclpiadaceae	<i>Ceropegia omissa</i>	*	
90	Asclpiadaceae	<i>Ceropegia pusilla</i>	*	
91	Asclpiadaceae	<i>Ceropegia spiralis</i>	*	
92	Asclpiadaceae	<i>Ceropegia thwaitesii</i>	*	
93	Oleaceae	<i>Chionanthus leprocarpa</i> var. <i>courtallensis</i>		*
94	Oleaceae	<i>Chionanthus linocieroides</i>		*
95		<i>Chrysoglossum hallbergii</i>	*	
96	Lauraceae	<i>Cinnamomum filipedicellatum</i>		*
97	Lauraceae	<i>Cinnamomum keralense</i>		*
98	Lauraceae	<i>Cinnamomum macrocarpum</i>		*
99	Lauraceae	<i>Cinnamomum malabatum</i>		*

100	Lauraceae	<i>Cinnmomum perrottetii</i>		*
101	Lauraceae	<i>Cinnmomum riparium</i>		*
102	Lauraceae	<i>Cinnmomum sulphuratum</i>		*
103	Lauraceae	<i>Cinnmomum travancoricum</i>		*
104		<i>Cleistanthus malabaricus</i>		*
105		<i>Cleistanthus travancorensis</i>		*
106		<i>Clematis bourdillonii</i>	*	
107		<i>Clematis theobromina</i>	*	
108		<i>Cleome burmanni</i>	*	
109	Orchidaceae	<i>Coelogyne mossiae</i>	*	
110	Commeliniaceae	<i>Commelina indehiscens</i>	*	
111	Commeliniaceae	<i>Commelina wightii</i>	*	
112		<i>Corymborkis veratifolia</i>	*	
113	Fabaceae	<i>Crotalaria fysonii</i>	*	
114	Fabaceae	<i>Crotalaria globosa</i>	*	
115	Fabaceae	<i>Crotalaria peduncularis</i>	*	
116	Fabaceae	<i>Crotalaria priestleyoides</i>	*	
117	Fabaceae	<i>Crotalaria scabra</i>	*	
118	Euphorbiaceae	<i>Croton malabaricus</i>		*
119	Lauraceae	<i>Cryptocarya beddomei</i>		*
120	Lauraceae	<i>Cryptocarya bourdillonii</i>		*
121	Lauraceae	<i>Cryptocarya stocksii</i>		*
122	Commelineaceae	<i>Cyanotis cerifolia</i>	*	
123	Cyatheaceae	<i>Cyathea nilgirensis</i>	*	
124	Menispermaceae	<i>Cyclea fissicalyx</i>	*	
125		<i>Cynometra beddomei</i>	*	*
126		<i>Cynometra bourdillonii</i>		*
127		<i>Cynometra travancorica</i>	*	*
128		<i>Decaschistia rufa</i>	*	
129		<i>Desmos viridiflorus</i>	*	
130		<i>Dialium travancoricum</i>	*	*
131		<i>Dicranopteris linearis</i>	*	
132		<i>Dictyospermum ovalifolium</i>	*	
133		<i>Didymocarpus missionis</i>	*	
134		<i>Dimorphocalyx beddomei</i>		*
135		<i>Dimorphocalyx lawianus</i>		*
136	Ebanaceae	<i>Diospyros assimilis</i>		*
137	Ebanaceae	<i>Diospyros atrata</i>		*
138	Ebanaceae	<i>Diospyros bourdillonii</i>		*
139	Ebanaceae	<i>Diospyros candolleana</i>		*
140	Ebanaceae	<i>Diospyros foliolosa</i>		*
141	Ebanaceae	<i>Diospyros ghatensis</i>		*
142	Ebanaceae	<i>Diospyros humilis</i>		*
143	Ebanaceae	<i>Diospyros nilagirica</i>		*
144	Ebanaceae	<i>Diospyros paniculata</i>		*
145	Ebanaceae	<i>Diospyros pruriens</i>		*
146	Ebanaceae	<i>Diospyros saldanhae</i>		*
147	Ebanaceae	<i>Diospyros sulcata</i>		*
148		<i>Dipterocarpus bourdillonii</i>		*
149		<i>Dipterocarpus indicus</i>		*

150	Euphorbiaceae	<i>Drypetes confertiflorus</i>		*
151	Euphorbiaceae	<i>Drypetes elata</i>		*
152	Euphorbiaceae	<i>Drypetes malabarica</i>		*
153	Euphorbiaceae	<i>Drypetes oblongifolia</i>		*
154	Euphorbiaceae	<i>Drypetes venusta</i>		*
155	Euphorbiaceae	<i>Drypetes wightii</i>		*
156		<i>Dysoxylum beddomei</i>		*
157		<i>Dysoxylum ficiforme</i>		*
158		<i>Dysoxylum malabaricum</i>		*
159	Elaeocarpaceae	<i>Elaeocarpus munronii</i>	*	*
160	Elaeocarpaceae	<i>Elaeocarpus recurvatus</i>	*	*
161	Elaeocarpaceae	<i>Elaeocarpus venustus</i>	*	
162		<i>Elaphoglossum beddomei</i>	*	
163		<i>Elaphoglossum nilgircum</i>	*	
164		<i>Elaphoglossum stigmatolepis</i>	*	
165		<i>Eria albiflora</i>	*	
166		<i>Eriochrysis rangacharii</i>	*	
167	Myrtaceae	<i>Eugenia argentea</i>	*	*
168	Myrtaceae	<i>Eugenia cotonifolia</i> ssp. <i>codyensis</i>		*
169	Myrtaceae	<i>Eugenia discifera</i>	*	
170	Myrtaceae	<i>Eugenia singampattiana</i>	*	
171	Rutaceae	<i>Euodia lunu-ankenda</i> var. <i>tirunelvelica</i>		*
172		<i>Euonymus angulatus</i>	*	*
173		<i>Euonymus crenulatus</i>		*
174		<i>Euonymus dichotomus</i>		*
175		<i>Euonymus indicus</i>		*
176		<i>Euonymus serratifolius</i>	*	*
177		<i>Ficus beddomei</i>		*
178		<i>Flacourtia montana</i>		*
179	Clusiaceae	<i>Garcinia gummi-gutta</i>		*
180	Clusiaceae	<i>Garcinia rubro-echinata</i>		*
181	Clusiaceae	<i>Garcinia talbotii</i>		*
182	Clusiaceae	<i>Garcinia travancorica</i>		*
183	Clusiaceae	<i>Garcinia wightii</i>		*
184	Euphorbiaceae	<i>Glochidion bourdillonii</i>		*
185	Euphorbiaceae	<i>Glochidion ellipticum</i> var. <i>ellipticum</i>		*
186	Euphorbiaceae	<i>Glochidion ellipticum</i> var. <i>ralphii</i>		*
187	Euphorbiaceae	<i>Glochidion malabaricum</i>		*
188	Euphorbiaceae	<i>Glochidion nailgherrense</i>		*
189	Euphorbiaceae	<i>Glochidion tomentosum</i>		*
190		<i>Gluta travancorica</i>		*
191	Rutaceae	<i>Glycosmis macrocarpa</i>	*	*
192		<i>Goniothalamus cardiopetalus</i>		*
193		<i>Goniothalamus rhynchantherus</i>	*	*
194		<i>Goniothalamus wightii</i>		*
195		<i>Goniothalamus wynaadensis</i>		*
196		<i>Gordonia oblusa</i>		*
197		<i>Gymnacranthera canarica</i>		*
198	Orchidaceae	<i>Habenaria bamesii</i>	*	
199	Rubiaceae	<i>Hedyotis barberi</i>	*	

200 Rubiaceae	Hedyotis beddomei	*	
201 Rubiaceae	Hedyotis buxifolia	*	
202 Rubiaceae	Hedyotis eualata	*	
203 Rubiaceae	Hedyotis fruticosa	*	
204 Rubiaceae	Hedyotis hirsutissima	*	
205 Rubiaceae	Hedyotis ramarowii	*	
206 Rubiaceae	Hedyotis swersoides	*	
207	Helichrysum perlanigerum	*	
208	Heritiera papilio		*
209 Anacardiaceae	Holigama amottiana		*
210 Anacardiaceae	Holigama beddomei		*
211 Anacardiaceae	Holigama ferruginea		*
212 Anacardiaceae	Holigama grahamii		*
213 Anacardiaceae	Holigama nigra		*
214	Homalium travancoricum		*
215	Hopea erosa		*
216	Hopea glabra		*
217	Hopea parviflora		*
218	Hopea ponga		*
219	Hopea racophloea		*
220	Hopea utilis		*
221	Hugonia belli	*	
222	Humboldtia bourdillonii	*	*
223	Humboldtia brunonis		*
224	Humboldtia decurrens	*	*
225	Humboldtia laurifolia	*	
226	Humboldtia unijuga var. unijuga	*	*
227	Humboldtia vahliana		*
228	Hydnocarpus macrocarpa ssp. macrocarpa	*	*
229	Hydnocarpus pentandra		*
230	Hydrocotyle conferta	*	
231	Ilex gardneriana	*	
232 Balsaminaceae	Impatiens anaimudica	*	
233 Balsaminaceae	Impatiens johnii	*	
234 Balsaminaceae	Impatiens macrocarpa	*	
235 Balsaminaceae	Impatiens munnarensis	*	
236 Balsaminaceae	Impatiens neo-barnesii	*	
237 Balsaminaceae	Impatiens nilagirica	*	
238 Balsaminaceae	Impatiens pandata	*	
239	Indigofera constricta	*	
240	Indotristicha tirunelveliiana	*	
241	Inga cyanometroides		*
242	Inga cynometroides	*	
243	Ipea malabarica	*	
244	Isachne fischeri	*	
245	Isonandra perrotteetiana		*
246	Isonandra stocksii	*	
247	Isonandra villosa	*	
248 Rubiaceae	Ixora brachiliata		*
249 Rubiaceae	Ixora elongata		*

250 Rubiaceae	<i>Ixora jhonsoni</i>		*
251 Rubiaceae	<i>Ixora lawsonii</i>		*
252 Rubiaceae	<i>Ixora leucantha</i>		*
253 Rubiaceae	<i>Ixora malabarica</i>		*
254 Rubiaceae	<i>Ixora notoniana</i>		*
255 Rubiaceae	<i>Ixora polyantha</i>		*
256	<i>Julostylis polyandra</i>	*	
257	<i>Kalanchoe olivacea</i>	*	
258	<i>Kingiodendron pinnatum</i>		*
259 Myristicaceae	<i>Knema attenuata</i>		*
260	<i>Lasianthus jackianus</i>		*
261	<i>Lasianthus rostratus</i>		*
262	<i>Lepidagathis barberi</i>	*	
263	<i>Leptonychia moacurrooides</i>		*
264	<i>Limnopoa meeboldii</i>	*	
265	<i>Lindsea malabarica</i>	*	
266	<i>Liparis biloba</i>	*	
267 Lauraceae	<i>Litsea bourdillonii</i>		*
268 Lauraceae	<i>Litsea coriacea</i>		*
269 Lauraceae	<i>Litsea floribunda</i>		*
270 Lauraceae	<i>Litsea glabrata</i>		*
271 Lauraceae	<i>Litsea koralana</i>		*
272 Lauraceae	<i>Litsea laevigata</i>		*
273 Lauraceae	<i>Litsea ligustrina</i>		*
274 Lauraceae	<i>Litsea mysorensis</i>		*
275 Lauraceae	<i>Litsea stocksii</i>		*
276 Lauraceae	<i>Litsea travancorica</i>		*
277 Lauraceae	<i>Litsea wightiana</i> var. <i>tomentosa</i>		*
278 Lauraceae	<i>Litsea wightiana</i> var. <i>wightiana</i>		*
279	<i>Mackenziaea caudata</i>	*	
280	<i>Madhuca bourdillonii</i>	*	*
281	<i>Madhuca diplostemon</i>	*	
282	<i>Maesa velutina</i>		*
283 Euphorbiaceae	<i>Mallotus atrovirens</i>		*
284 Euphorbiaceae	<i>Mallotus aureo-punctatus</i>		*
285 Euphorbiaceae	<i>Mallotus beddomei</i>		*
286 Euphorbiaceae	<i>Mallotus stenanthus</i>		*
287	<i>Mastixia arborea</i>		*
288	<i>Meiogyne pannosa</i>		*
289	<i>Meiogyne ramarowii</i>		*
290	<i>Melicope indica</i>	*	
291 Melastomaceae	<i>Memecylon depressum</i>		*
292 Melastomaceae	<i>Memecylon flavescens</i>	*	
293 Melastomaceae	<i>Memecylon heyneanum</i>		*
294 Melastomaceae	<i>Memecylon lawsonii</i>		*
295 Melastomaceae	<i>Memecylon malabaricum</i>		*
296 Melastomaceae	<i>Memecylon sisparensis</i>	*	
297 Melastomaceae	<i>Memecylon talbotianum</i>		*
299 Myrtaceae	<i>Meteoromyrtus vynaadensis</i>		*
300	<i>Michelia nilagirica</i>		*

301	<i>Microtropis densiflora</i>		*
302	<i>Microtropis latifolia</i>		*
303	<i>Microtropis stocksii</i>		*
304	<i>Milium nilagirica</i>	*	
305	<i>Milium nilagirica</i>		*
306	<i>Milium wightiana</i>		*
307	<i>Mitrephora grandiflora</i>		*
308	<i>Murdannia juncooides</i>	*	
309	<i>Murdannia lanceolata</i>	*	
310	<i>Myristica fatua</i> var. <i>magnifica</i>		*
311	<i>Myristica malabarica</i>		*
312	<i>Neolitsea fischeri</i>		*
313	<i>Nostolachma crassifolia</i>		*
314	<i>Nothopegia aureo-fulva</i>	*	
315	<i>Nothopegia beddomei</i> var. <i>wynaadica</i>		*
316	<i>Nothopegia heyneana</i>		*
317	<i>Nothopegia travancorica</i>		*
318	<i>Oberonia brachyphylla</i>	*	
319	<i>Ochreinauclea missionis</i>	*	
320	<i>Ochreinauclea missionis</i>		*
321	<i>Octotropis travancorica</i>		*
322	<i>Ophiorrhiza barnesii</i>	*	
323	<i>Ophiorrhiza brunonis</i>	*	
324	<i>Ophiorrhiza caudata</i>	*	
325	<i>Ophiorrhiza incarnata</i>	*	
326	<i>Ophiorrhiza pykarensis</i>	*	
327	<i>Ophiorrhiza radicans</i>	*	
328	<i>Ormosia travancorica</i>		*
329	<i>Orophea erythrocarpa</i>		*
330	<i>Orophea thomsoni</i>		*
331	<i>Orophea uniflora</i>	*	*
332	<i>Otenephium stipulaceum</i>		*
333	<i>Palaquium bourdillonii</i>	*	*
334	<i>Palaquium ellipticum</i>		*
335	<i>Palaquium ravii</i>		*
336	<i>Paphiopedilum druryi</i>	*	
337	<i>Pavetta hohonackori</i>	*	
338	<i>Pavetta oblanceolata</i>	*	
339	<i>Pavetta wightii</i>	*	
340	<i>Peucedanum anamallayense</i>	*	
341	<i>Phaeanthus malabaricus</i>	*	*
342	<i>Pimpinella pulneyensis</i>	*	
343	<i>Pinanga dicksonii</i>		*
344	<i>Piper barberi</i>	*	
345	<i>Pithecolobium gracile</i>		*
346	<i>Pittosporum dasycaulon</i>		*
347	<i>Pittosporum neelgherrense</i>		*
348	<i>Plectranthus bishopianus</i>	*	
349	<i>Plectranthus bourneae</i>	*	
350	<i>Poeciloneuron indicum</i>		*

351	<i>Poeciloneuron pauciflorum</i>	*	
352	<i>Pogostemon atropurpureus</i>	*	
353	<i>Pogostemon nilagiricus</i>	*	
354	<i>Pogostemon paludosus</i>	*	
355	<i>Pogostemon travancoricus</i> var. <i>travancoricus</i>	*	
356	<i>Polyalthia fragrans</i>		*
357	<i>Polyalthia rufescens</i>	*	*
358	<i>Polyalthia shendumii</i>		*
359	<i>Popowia beddomeana</i>	*	*
360	<i>Pronephrium thwaitesii</i>	*	
361	<i>Pseudocyclosorus gamblei</i>	*	
362	<i>Pseudocyclosorus griseus</i>	*	
363	<i>Pseudoglochidion anamallayanum</i>	*	
364	<i>Psychotria anamallayana</i>		*
365	<i>Psychotria dalzellii</i>		*
366	<i>Psychotria globicephala</i>		*
367	<i>Psychotria macrocarpa</i>		*
368	<i>Psychotria nigra</i>		*
369	<i>Psychotria nudiflora</i>		*
370	<i>Psychotria truncata</i>		*
371	<i>Pterospermum reticulatum</i>	*	*
372	<i>Pterospermum rubiginosum</i>		*
373	<i>Reinwarditiadendron anamallayan</i>		*
374	<i>Rhododendron nilagiricum</i>		*
375	<i>Rhynchosia velutina</i>	*	
376	<i>Rhynchospora submarginata</i>	*	
377	<i>Sageraea grandiflora</i>	*	*
378	<i>Sageraea laurifolia</i>		*
379	<i>Salacia malabarica</i>	*	
380	<i>Saprosma corymbosum</i>		*
381	<i>Saprosma fragrans</i>		*
382	<i>Schefflera capitata</i>		*
383	<i>Schefflera chandrasekharanii</i>		*
384	<i>Schefflera racemosa</i>		*
385	<i>Schefflera rostrata</i> var. <i>rostrata</i>		*
386	<i>Semicarpus auriculata</i>		*
387	<i>Semicarpus travancorica</i>		*
388	<i>Senecio kundaicus</i>	*	
389	<i>Smilax wightii</i>	*	
390	<i>Spondias indica</i>		*
391	<i>Symplocos anamallayana</i>		*
392	<i>Symplocos foliosa</i>		*
393	<i>Symplocos macrocarpa</i> ssp. <i>kanarana</i>		*
394	<i>Symplocos macrocarpa</i> ssp. <i>macrocarpa</i>		*
395	<i>Symplocos macrophylla</i> ssp. <i>rosea</i>		*
396	<i>Symplocos wynadense</i>		*
397	<i>Syzygium bourdillonii</i>	*	
398	<i>Syzygium palghatense</i>	*	
399	<i>Syzygium travancoricum</i>	*	
400	<i>Tephorsia barberi</i>	*	

401	<i>Tephrosia wynaadensis</i>	*	
402	<i>Thotlea barberi</i>	*	
403	<i>Toxocarpus baddomei</i>	*	
404	<i>Toxocarpus palghatensis</i>	*	
405	<i>Utleria salicifolia</i>	*	
406	<i>Vanasushava pedata</i>	*	
407	<i>Yanda wightii</i>	*	
408	<i>Vanilla wightiana</i>	*	
409	<i>Valeria macrocarpa</i>	*	
410	<i>Vernonia multibracteata</i>	*	
411	<i>Vernonia pulneyensis</i>	*	
412	<i>Vernonia recurva</i>	*	
413	<i>Willisia selagioides</i>	*	

別添資料4 KFD テリトリアル・ウイングのフィールド組織

表1: KFD テリトリアル・ウイングのフィールド組織と責任者

レベル/仮訳	責任者/仮訳	備考
Circle/営林局	CF/営林局長	IFS
Divison/営林支局	DFO/営林支局長→DCF あるいは ACF が務める	IFS/KFS
Range/営林署	RFO/営林署長	KFS
Station/営林支署	DRFO/営林支署長	KFS

出所: KFD の CF (Human Resource Development) へのインタビュー

表2: KFD テリトリアル・ウイングの Circle、Division、Range

地域名	Circle 名	Division 名	各 Division 面積 (平方キロ)	Range 数	
北部	Kozhikode (Northern)	1. Kannur	290.32	5	
		2. Callicut	290.80	3	
		3. Wayanad (North)	215.89	3	
		4. Wayanad (South)	326.65	3	
	Olavakode	1. Nilambur (North)	393.96	3	
		2. Nilambur (South)	365.54	2	
		3. Nenmara	339.41	3	
		4. Mannarkad	530.11	3	
		5. Palakkad	238.40	3	
	Central	1. Trissur	210.64	3	
		2. Malayattoor	617.76	4	
		3. Vazhachal	413.95	5	
		4. Chalakkudy	279.91	3	
	南部 (CCF)	High Range	1. Kottayam	692.15	4
			2. Kothamangalam	317.01	4
			3. Mankulam	—	2
4. Munnar			715.84	5	
Southern		1. Thiruvananthapuram	369.88	3	
		2. Thenmala	206.17	2	
		3. Punalur	280.22	2	
		4. Konni	331.66	3	
		5. Ranni	1059.07	3	

		6. Achenkovil	269.00	3
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出所：KFRI 作成地図（Kerala State Forest Divisions and Ranges）より作成。ケララ州政府公式ホームページの数値と Circle 数が異なっていることに留意されたい。

別添 4-2 : KFD 社会林業ウイングのフィールド組織

表 1 : 社会林業ウイングのフィールド組織と責任者

組織/仮訳	責任者/仮訳	備考
Social Forestry Circle/社会林業営林局	CF(SF)/局長 (社会林業)	IFS
Social Forestry Division/社会林業営林支局	DFO(SF)/支局長 (社会林業) →DCF あるいは ACF が務める	IFS/KFS
Social Forestry Range/社会林業営林署	RFO(SF)/署長 (社会林業)	KFS
Social Forestry Section/社会林業営林支署	DRFO(SF)/支署長 (社会林業)	KFS

表 2 : KFD 社会林業ウイングの Circle と Division

Circle 名	Division 名
Kozhikode (北部)	1. Kasorgode
	2. Kannur
	3. Wayanad
	4. Mallapuram
	5. Kozhikode
Ernakulum (中央部)	6. Palakkad
	7. Trissur
	8. Ernakulum
	9. Idduki
Kollam (南部)	1. Kottayam
	2. Pathanamthitta
	3. Alappuzha
	4. Kollam
	5. Thiruvananthapuram

出所 : KFD 人材開発課長 (CF (Human Resource Development)) 提供資料より作成

別添 4-3 : KFD 野生生物ウイングのフィールド組織

野生生物ウイングのフィールド組織の中心は、州内の保護地域 14 箇所を管轄する野生生物 Division である。

表 1 : 野生生物ウイングのフィールド組織

責任者	野生生物 Division	面積 (平方キロ)	備考: 当該のテリ トリアル Circle
Conservator (野生生物)	1. Aralam	NA	NA
	2. Pavambikula	274.14	Olavakode
	3. Peech	201.73	Central
	4. Silent Valley National Park	89.52	Olavakode
	5. Wayanad	399.55	Northern
Conservator (Agasthyavana m 生物学公園)	1. Agasthyavanam	NA	Southern
	2. Shendurney	153.32	Southern
	3. Thruvananthapuram	128.00	Southern
フィールド・デ イレクター	1. Eravikalam	187.44	High Range
	2. Iduki	130.52	High Range
	3. Thekkady	777.54	High Range
	4. Peerumedu	NA	NA

出所 : KFD 人材開発課長 (CF (Human Resource Development)) 提供資料より作成

別添 4-5: 2001-2002 年度 に終了した MOEF の関連プロジェクト

表 1: 生態系研究スキームのプロジェクト

	プロジェクト・タイトル	実施機関
1.	Floristic diversity and conservation ecology of selected endemic and key stone species of Agastayamalai hills in western Ghats	Madurai Kamaraj University
2.	Plant diversity and community patterns in managed and natural growth forests of northeastern Uttar Pradesh.	Gorakhpur University

表 2: 西側ガーツ 及び東側ガーツのプロジェクト

	プロジェクト・タイトル	実施機関
1.	Evaluation of fire retardant species to form vegetational fire breaks in Grass Hills, Western Ghats.	Kongunadu Arts & Science College
2.	Mapping plant diversity in the Eastern Ghats of Tiruchirapalli.	St. Joseph College

出所: Annual Report (2001-2002), MOEF

別添 4-6: 2001-2002 年度 に進行中の MOEF の関連プロジェクト

表 1 : 生態系研究スキームのプロジェクト

	プロジェクト・タイトル	実施機関
1.	A study on traditional knowledge of ethnobotanical resources of Kachchh: an approach to the natural resource conservation through creation of Ethnobotanical Database.	Gujarat Institute of Desert Ecology
2.	Plant gall ecology in scrub forest ecosystem	Presidency College Chennai.
3.	Studies on ecosystem dynamics of disturbed and undisturbed tropical rain forests of Arunachal Pradesh	North Eastern Regional Institute of Science & Technology,
4.	Effects of forest fire on floristics and species diversity of mid hills of H.P.	University of Horticulture & Forestry, Nauni, Solan
5.	Seed technology of forest trees: post harvest handling and ex-situ storage.	Pt.Ravishankar Shukla University

表 2 : 西側ガーツのプロジェクト

	プロジェクト・タイトル	実施機関
1.	Ecology and conservation of selected tree endemics of Kerala	KFRI
2..	Bio-diversity of plant pathogenic fungi, in the Kerala part of the Western Ghats	KFRI
3.	Development of Protocols for Micropropagation of an endangered forest tree <i>Givotia rottleifomis</i> Griff (Euphorbiaceae)	
4.	Micropropagation and germplasm conservation of endangered medical plants of Western Ghats	National Chemical Laboratory

表 3 : 生物圏リザーブ・スキーム のプロジェクト

	プロジェクト・タイトル	実施機関
1.	Evaluation of plant diversity and restocking of selection felled gaps in the Tropical Wet Evergreen Forests of Nilliampathy in the Western Ghats of Kerala	KFRI

出所 : Annual Report (2001-2002), MOEF

別添資料5 中央サークルの中央苗畑で育苗されている樹種

- 1 *Acacia mangium*
- 2 *Achras sapota*
- 3 *Aegle marmelos*
- 4 *Ailanthus exelsia*
- 5 *Albezia lebbeck*
- 6 *Annona reticulata*
- 7 *Artocarpus heterophyllus*
- 8 *Artocarpus hirsutus*
- 9 *Azadirachta indica*
- 10 *Bambosa bamboo*
- 11 *Bixa orehana*
- 12 *Bottle brush*
- 13 *Calamus twaitisii*
- 14 *Cassia fistula*
- 15 *Casuarina equisetifolia*
- 16 *Cinnamom malabathrum*
- 17 *Citrus Sp.*
- 18 *Citrus Sp. (Orange)*
- 19 *Dalbergia latifolia*
- 20 *Dalbergia paniculata*
- 21 *Diospiros sp.*
- 22 *Dysoxylum fusiforme*
- 23 *Egg Fruit*
- 24 *Emblica officinalis*
- 25 *Garcinia gummi-gutta*
- 26 *Gmelina arborea*
- 27 *Knema attenuata*
- 28 *Lagerstroemia speciosa*
- 29 *Lagerstromia microcarpa*
- 30 *Mangostin*
- 31 *Melia dubia*
- 32 *Michelia champaka*
- 33 *Mimusopus elengi*
- 34 *Myristica fragrance*
- 35 *Oil Palm*
- 36 *Persia macrantha*
- 37 *Pongamia pinnata*
- 38 *Pterocarpus marsupium*
- 39 *Pterocarpus santalinus*
- 40 *Samanya saman*
- 41 *Santalum album*
- 42 *Spondias indica*
- 43 *Swietenia macrophylla*
- 44 *Syzygium cumini*
- 45 *Syzygium jambuloana*
- 46 *Tectona grandis*
- 47 *Terminalia bellirica*
- 48 *Terminalia catappa*
- 49 *Terminalia chebula*
- 50 *Terminalia crenulata*
- 51 *Vateria indica*
- 52 *Chukrasia tabularis*

Serial No.	Activity No.	Time of Purchase (half / year)	Name of Equipment	No. of Equipment	Unit Price (US\$)	Total Price (US\$)	Using Div & Person in Charge	Function-Based Name	Analytic Use of the Equipment	Using Purpose (Specific for Project)	Specification including resolution level	Brand Name	Manufacturer's Name	Remarks		
														Spatial Dimension	Control Range	Installation Charge (Rs.)
1	1.1	2002	PC	1	10,000	10,000	Ecology- SIC	Computer	Word processing	Data analysis	P IV	IBM	IBM			Working
2	1.2	1985	Incubator	1	4,000	4,000	Ecology- SIC	Warming	Heating and drying	Drying of plant specimens	Dehumidifier type	HISCO, India	HISCO, India		50-300 oC	Needs repair
3	1.2	1990	Electronic balance	1	7,000	7,000	Ecology- SIC	Balance	Weighing	Weighing seeds etc	0.01g accuracy	Sartorius	Sartorius		0.01 g	Working
4	1.6	2001	PC	1	1,500	1,500	Entomology, SIC	Computer	Data analysis	Data analysis	Pentium IV	IBM	IBM	Desktop		Working
5	1.6	1980	Microscope	1	-	-	Entomology, SIC	View microscopic objects	Examine small objects	Examining pollen grains	60 x 10	Meopta	Meopta (CEZ)	30 x 30 cm	100-600	Out dated -Fungal attack on lens
6	1.6	1998	Microscope (stereo)	1	-	-	Entomology, SIC	View microscopic objects	Examine small objects	Examining pollinators	45 x 10	CETI	CETI (Belgium)	30 x 30 cm	100-450	Magnification insufficient
7	1.6		Magna scope	1	100	100	Entomology, SIC	View Small objects	Examine small objects	Examining pollinators	Nil			30 x 45 cm	20 times	Working
8	1.6	1995	Camera	1	9,000	9,000	Entomology, SIC	Photography	Take photographs	Photographing pollinators	SLR 35 mm lens	Nikkon	Nikon	15 x 15 cm	35-105 mm	Fungal growth on lens. Require servicing
9	2.1	1990	Porometer	1	2,000	2,000	Plant Physiology SIC	Steady State Porometer	Stomatal conductance	To measure Stomatal resistance	Open	LI-1600	Li-Cor, USA			Working
10	2.1	1989	Analytical Balance	1	800	800	Plant Physiology SIC	Electronic Balance	Weighing	Weighing leaves	120 gm	Sartorius	Sartorius, Germany			Working
11	2.1	1989	Pressure chamber	1	2,500	2,500	Plant Physiology SIC	Pressure chamber	Water potential of leaf	To measure leaf water potential	40 bars	Pressure chamber apparatus	Soil moisture Equipment Corp, USA			Needs repair
12	2.1	1989	UV-Spectrophotometer	1	6,000	6,000	Plant Physiology SIC	Spectrophotometer	Chemical analysis	Nil	UV-VIS	Spectrophotometer	LKB International, England			Needs repair
13	2.1	1989	Waterbath shaker	2	1,000	2,000	Plant Physiology SIC	Water bath shaker	Constant temperature shaking	Nil	0.2oC	Waterbath shaker	Braun, Germany			Working
14	2.1	1989	Cryoscopic osmometer	1	1,500	1,500	Plant Physiology SIC	Osmometer	Osmotic potential	To measure tissue osmotic potential	0.1 bar	Osmometer	Gonatec, Germany			Needs repair
15	2.1	1990	Digital oxygen system	1	800	800	Plant Physiology SIC	Oxygen electrode	Oxygen determination	Nil	Oxygen electrode	Oxygen electrode	Rank Brothers, England			Working

別添資料 6 当プロジェクトに関する既存の機材 / 当プロジェクトに要請されている機材

List of Existing Equipment in KFRI - Conservation of RET tree species

Serial No.	Activity No.	Time of Purchase (half / year)	Name of Equipment	No. of Equipment	Unit Price (US\$)	Total Price (US\$)	Using Div & Person in Charge	Function-Based Name	Analytic Use of the Equipment	Using Purpose (Specific for Project)	Specification including resolution level	Brand Name	Manufacturer's Name	Remarks		
														Spatial Dimension	Control Range	Installation Charge (Rs.)
16	2.1	1989	Dismembrator	1	2,500	2,500	Plant Physiology SIC	Dismembrator	Fine powdering	Nil	Teflon chamber	Dismembrator	Braun, Germany			Working
17	2.1	1996	Line quantum sensor	1	2,200	2,200	Plant Physiology SIC	Light sensor	PAR measurements	To measure PAR light	PAR range	Line quantum sensor	Li-Cor, USA			Working
18	2.1	1979	Hygrothermograph	1	500	500	Plant Physiology SIC	Hygrothermograph	Temperature and RH	To measure relative humidity and temperature	0-50oC	Hygrothermograph	Weather measures, U.K.			Needs repair
19	2.1	1979	Electric Owen	1	600	600	Plant Physiology SIC	Electric Owen	Heating and drying	To dry plant materials for taking dry weight	30-120oC	High temperature Owen	Tempo, Madras, India			Needs repair
20	2.1	1998	Freeze drier	1	6,000	6,000	Plant Physiology SIC	Freeze drier	Drying under cold temperature	Nil	Drying after freezing	Freeze Drier	Braun, Germany			Working
21	2.1	1997	Leaf area meter	1	4,000	4,000	Plant Physiology SIC	Portable area meter	Leaf area	To measure leaf area	Scanning type	Leaf area meter	Li-Cor, USA			Working
22			Portable Photosynthesis system		10,000	-	Plant Physiology SIC	Infra red gas analyser	Photosynthesis	To measure photosynthesis of RET sps	LI-6200					Needs replacement
23	2.2	1979	Research Microscope	1	12,000	12,000	Plant Pathology-SIC	Research Microscope	Microscopic examinations	Identification of mycorrhizal infection, spores, hyphae, etc.	Bright field, dark field, 100 x 10 magnification	Dialux -20	Leica			
24	2.2	1979	Stereobinocular Microscope	1	10,000	10,000	Plant Pathology-SIC	Stereobinocular Microscope with photographic attachment	Microscopic examinations	To study the morphological details of mycorrhizae, fungal spores, retrieval of spores, etc.	Transmitted light	Wild	Leica			
25	2.2	1979	Cryostat	1	10,000	10,000	Plant Pathology-SIC	Cryomicrotome	Microtome sectioning of fungal and host tissues	Microtome sectioning of frozen delicate tissues	Frozen stage (-20 °C) knife (-15 °C)	Minotome	IEC			
26	2.2	2001	Water distilling Unit	1	1,000	1,000	Plant Pathology-SIC	Water distilling Unit	Glass Distillation of water	Glass Distillation of water	Glass distillation 1.5 lit.	Waterstill	Merck			

Serial No.	Activity No.	Time of Purchase (half / year)	Name of Equipment	No. of Equipment	Unit Price (US\$)	Total Price (US\$)	Using Div & Person in Charge	Function-Based Name	Analytic Use of the Equipment	Using Purpose (Specific for Project)	Specification including resolution level	Brand Name	Manufacturer's Name	Remarks		
														Spatial Dimension	Control Range	Installation Charge (Rs.)
27	2.2	1996	Horizontal gel electrophoresis	1	1,500	1,500	Plant Pathology-SIC	Submarine Electrophoresis equipment	DNA fragment separation	To determine level of inbreeding & genetic diversity	12 lanes	Mini Sub cell GT	Bio-Rad	7 x 7 cm	-	
28	2.2	1996	Deep freeze (-)	1	1,200	1,200	Plant Pathology-SIC	Freezer	To preserve tissue samples	Nil	Cooling up to -35C	170D	Remi	100 x 75 x 90 cm	0 to -35 C	
29	2.2	1984	Ultracentrifuge	1	24,000	24,000	Plant Pathology-SIC	Centrifugation	Centrifuging	Nil	65000 RPM	OTD 65 B	Sorvaall	-	-	Not work-ing
30	2.2	1984	High Speed	1	12,000	12,000	Plant Pathology-SIC	Centrifugation	Sedimentation	Nil	25000 RPM	65B	Sorvall	Mini-mum 25 ml only	Upto 25000RPM	
31	2.2	1999	Electronic balance	1	2,000	2,000	Plant Pathology-SIC	Weighing Balance	Precision weighing	Weighing of fine chemicals	0.1 mg	1210	Sartorius	-	Weigh-ing upto 80 g	
32	2.2	1998	Laminar Flow cabinet	1	2,000	2,000	Plant Pathology-SIC	Sterile air flow chamber	Sterile working platform	Inoculation studies	-	-	Klenz-aids	-	-	
33	2.2	1996	Horizontal gel electrophoresis	1	1,500	1,500	Plant Pathology-SIC	Submarine Electrophoresis equipment	DNA fragment separation	To determine level of inbreeding & genetic diversity	12 lanes	Mini Sub cell GT	Bio-Rad	7 x 7 cm	-	
34	2.2	1996	Deep freeze (-)	1	1,200	1,200	Plant Pathology-SIC	Freezer	To preserve tissue samples	Nil	Cooling up to -35C	170D	Remi	100 x 75 x 90 cm	0 to -35C	
35	2.3	1998	Autoanalyzer	1	7,200	7,200	Plant Pathology-SIC	Analytical instrument	Soil and plant analyses	Project based use	Needs up-gradation	Technicon-II	Technicon	-	-	
36	2.3	1998	UV-vis spectrophotometer	1	4,000	4,000	Plant Pathology-SIC	Analytical instrument	Colourimetric analyses of Soil and plant samples	Project based use	UV-VIS	Unicam 5625	Unicam	-	-	
37	2.3	1998	Balance	1	1,600	1,600	Plant Pathology-SIC	Analytical grade	Minor weight	Project based use	0.01 g	Sartorius	Sartorius BP 310S	-	0.01 g	
38	2.3	1998	Programmed digestion	1	1,200	1,200	Plant Pathology-SIC	Digestion block	Sample preparation purpose	Project based use	50 sample digestion	-	-	-	-	
39	2.4	1997	Seed Germinator	4	-	-	Silviculture - SIC	Seed germinator	Germination under controlled conditions	To germinate seeds	0-60oC	Labline	Labline, Kochi	75*95*160 cm(1)	-	
40	3.1	1996	PCR Machine	1	2,500	2,500	Plant Pathology-SIC	Thermal Cycler	DNA ampli-fication	To determine level of inbreeding & genetic diversity	24 PCR tubes capacity	PTC 150	M.J. Research	45 x 30 cm	-	

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														Spatial Dimension	Control Range	Installation Charge (Rs.)
41	3.1	1996	Micropipettes	2	120	240	Plant Pathology-SIC	Pipetter	To pipette out liquids	To determine level of inbreeding and genetic diversity	10 µl	Gilson	Gilson	-	100 µl – 1000 µl	
42	3.1	1996	EDAS 120 Gel Doc system	1	6,000	6,000	Plant Pathology-SIC	Gel Doc. System	UV -Trans-illuminator only working	To determine level of inbreeding and genetic diversity	Digital Camera (not working)	EDAS 120	Kodak	-	Camera & printer (not working)	
43	3.1	1996	Sonicator	1	5,000	5,000	Plant Pathology-SIC	Cell disrupter	Cell disruption	Nil	-	Sonicator	Vertis	-	-	
44	3.1	1996	Deep freeze (-35)	1	1,200	1,200	Plant Pathology-SIC	Freezer	To preserve tissue samples	To determine level of inbreeding and genetic diversity	Cooling upto -35C	170D	Remi	100 x 75 x 90 cm	0 to -35C	
45	4.1	1980	Binocular research microscope	1	3,000	3,000	Wood Science - SIC	Light microscope	Micro Structure of tissues	Anatomical study	Magni. 1000m	Ergaval Carl Zeiss	VEB Carl Zeiss, Jena	30 x 20 x 45 cm		
46	4.1	1990	Binocular research microscope	1	10,000	10,000	Wood Science - SIC	Light microscope	Micro Structure of tissues	Anatomical study	Magni. 1000m	Leica Quantimet	Leica Cambridge Ltd	20 x 30 x 45 cm		
47	4.1	1980	Sliding Microtome	1	3,000	3,000	Wood Science - SIC	Microtome	Wood tissue	Material sectioning	Section thickness 1m	Reichert	Reichert optische Werke, A. G. Austria	45 x 25 x 25 cm		
48	4.1	1985	Knife sharpener	1	8,000	8,000	Wood Science - SIC	Knife sharpener	Microtome knife	Microtome knife sharpening		Shandon Autossharp	Shandon Southern products, UK	50 x 45 x 50 cm		
49	4.1	1985	Electronic balance	1	1,200	1,200	Wood Science - SIC	Balance	Precision weighing	Weighing	0.001g	Sartorius	Sartorius AG, Germany	25 x 25 x 15 cm		
50	4.1	2001	Electronic balance	1	1,400	1,400	Wood Science - SIC	Balance	Precision weighing	Weighing	0.1g	Sartorius	Sartorius AG, Germany	25 x 30 x 10 cm		
51	5.2	1997	Moisture balance	1			Silviculture- SIC	Moisture balance	Drying and determining moisture content	To determine seed moisture	0.001g-310 g	Mettler Toledo	Mettler Toledo	50*30 cm		
52	5.2	2001	Deep Freezer	1			Silviculture- SIC	Freezer	Low temperature freezing	Seed storage studies	°C	Labline	Labline, Kochi	85*90*175 cm		

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														Spatial Dimension	Control Range	Installation Charge (Rs.)
53	5.5	1993, 2000	Horizontal steam sterilizer	2	2,300	4,600	Genetics - SIC	High pressure steam sterilizer	Sterilization	Sterilization of the media	9 kw , cylindrical	Natsteel, Mediquip				
54	5.5	1992, 1996, 2000	Laminar Flow bench	2	1,200	2,400	Genetics - SIC	Horizontal laminar Flow bench	Inoculation	For sterile transfers	4 ft	Kienzaid, Madras Air filters		4' X 2 ft		
55	5.5	1993, 1996	Shaker	2	5,000	10,000	Genetics - SIC	Orbital Shaker	Sample shaking	Maintenance of liquid cultures	Shaking	B. Braun, Remi	Braun, Germany, Remi Mumbai			
56	5.5	2000	Electronic Balance	1	1,500	1,500	Genetics - SIC	Analytical Balance	Precision weighing	Weighing of fine chemicals	0.1 mg	Sartorius	Sartorius			
57	5.5	1993	Distillation Units	2	500	1,000	Genetics - SIC	Quartz distillation units	Water distillation	Preparation of Distilled water	3 lits/day	Bhanu Scientific	Bhanu Scientific			
58	5.5	2000	Deep Freezer	1	9,000	9,000	Genetics - SIC	Domestic deep freezer	Freezing	Storing of chemicals	200 lits	Vestfrost	Blue star			
59	5.5	2000	Refrigerator	2	4,000	8,000	Genetics - SIC	Domestic Refrigerator	Cooling	Storing of Chemicals and stock solutions	300 lits and 250	Seimens	Seimens,			
60	5.5	1996	Plant Growth Chamber	1	1,000	1,000	Genetics - SIC	Plant growth chamber	Controlled conditions	Maintenance of cultures under controlled conditions	0-60oC	Sanyo	Sanyo			
61			Electronic balance	1	250	250	NWFP, SIC		Precision weighing	Weighing NWFP samples	upto 2kg	Essae D 498	Essae			
62		2000	Oven	1			Silviculture- SIC	Hot air Oven	Drying	Drying up seed/ plant samples	Up to	Labline	Labline, Kochi	80*90*140 cm		
63		2001	pH Meter	1			Silviculture- SIC	PH Meter	PH	PH measurements	0-14 pH	Cyber scan 510	Eutec Instrument	40*30 cm		
64		1998	Atomic absorption spectrometer	1	6,500	6,500	Pathology-SIC	Analytical instrument	Soil and plant analyses	Project based use	Manual sample feeding needs auto sampler	Varian 200	Varaian			Up-gradation required

Total	241,190	US\$
	124.00	J yen/ US\$
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														Spatial Dimension	Control Range	Installation Charge (Rs.)
1	1.1.1	1/1	Altimeter	2	200	400	Ecology- K. Swarupanandan	Altimeter	Altitude measurement	Distribution map preparation	2 m resolution		Gischard, Germany	10x10x5 cm	0-10000 m	Nil
2	1.1.1	1/1	GPS	2	500	1,000	Ecology- K. Swarupanandan	GPS	Geopositioning	Map preparation	15m Accuracy	Garmin	Garmin	18x10x5 cm	15 m resolution	Nil
3	1.1.1	1/1	GIS Software	1	20,000	20,000	FIS- PV Nair	Archiinfo, Imagine	GIS mapping	Distribution map preparation		ESR, ERDAS				
4	1.1.1	1/1	Work station	1 S	4,000	4,000	FIS- PV Nair	Computer Work station with	Computing and GIS mapping	Distribution map preparation		IBM	IBM			
5	1.1.1	1/1	Scanner	1	10,000	10,000	FIS- PV Nair	Digital Scanner (Jumbo)	Scanning large maps	Distribution map preparation		HP	HP			
6	1.1.1	1/1	Satellite images	1 S	10,000	10,000	FIS- PV Nair	Satellite maps-konos/spot	For scanning	Distribution map preparation						
7	1.1.1	1/1	Computer printer	1	16,000	16,000	FIS- PV Nair	Printer	Printing large maps	Distribution map preparation		HP	HP			
8	1.2.2	2/1	Binoculars	2	500	1,000	Ecology- K. Swarupanandan	Binoculars	Distant viewing	Viewing of flowering etc.		Leitz, Germany	Leitz, Germany	18x12x6 cm		Nil
9	1.1.1	1/1	Laptop Computer	1	2,500	2,500	Ecology- K. Swarupanandan	Computer	Computing	Download GPS data and analysis	Pentium IV	Compaq	Compaq	40x30x5 cm	1.8 Mhz	Nil
10	1.4.1	2/1	Stereo Microscope	1	7,000	7,000	Ecology- K. Swarupanandan	Microscope		Examination of flowers and fruits etc	MZ75	Zeiss	Zeiss	1000x600x900 cm		Nil
11	1.2.2	2/1	Digital Camera	1	3,000	3,000	Ecology- K. Swarupanandan	Camera		Photographing	Digital	Leica	Leica	15x10x10 cm	3 mega pixels or better	Nil
12	1.4.1	2/1	Research Microscope with fluorescence	1	20,625	20,625	Genetics - EP Indira	Microscope	To study the morphology and anatomy	Reproductive abnormalities and incompatibility mechanisms	10-100x Objective	Leica DMLB	Leica	1000x600x900 cm		Nil
13	1.6.1	1/1	Microscope + Image analyser	1	10,340	10,340	Entomology, George Mathew	Equipment to see magnified view of objects	Examine small objects	Microscopic examination and recording using image	10xX100x	Nikon or Leica	Nikon or Leica	60cmx60cm		
14	1.6.1	1/1	Stereo Microscope + digital camera	1	10,689	10,689	Entomology, George Mathew	Equipment to see magnified view of objects	Examine small objects	Pollinator examination in the lab and recording of pollinator activity using digital	10xX60x	Nikon or Leica	Nikon or Leica	45cmx45cm		
15	1.6.2	1/1	Scaffold tower	5	750	3,750	Entomology, George Mathew	Observation tower	Make observation of insect activity	To make observation on pollinators	30m high	Local fabrication	Local firm	3mX3mX30m	30m high	
16	1.6.2	1/1	Binoculars	1	500	500	Entomology, George Mathew	View distant objects	View insects	To observe pollinator activity	8xX42	Nikon	Nikon	20cmx20cm		
17	1.7.1	1/1	Digital Hypsometer with	3	1,000	3,000	Silviculture- KC Chacko	Height measuring instrument	Tree Height	To measure height of RET species		Forester Vertex	Forester AB Sweeden			Nil
18	1.7.1	1/1	Binocular	3	500	1,500	Silviculture- KC	Binocular		To Observe phenology						
19	1.7.1	1/1	GPS	3	500	1,500	Silviculture- KC									
20	2.1.1	1/1	Automated weather station	3	5,000	15,000	Plant Physiology Jose Kallarakal	Automated weather station	weather data	To measure weather data	Hourly averages	DataHog	Skye Instruments,	Field use	seconds interval logging	Nil

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21	2.1.1, 2.1.2, 2.1.3, 2.1.9	1/1	Laptop Computer	1	2,400	2,400	Plant Physiology Jose Kallarackal	Laptop Computer	Field computations	To download data from data loggers and instruments	Pentium IV	Most recent model	Compaq	40cmx40cmx5cm	256 kb RAM	Nil
22	2.1.2	2/1	Small data loggers	10	600	6,000	Plant Physiology Jose Kallarackal	data loggers	automatic recording of temp, RH etc	To store data from various sensors	Small & battery operated	Gemini	Tinytag, UK	10x10x5 cm	0.1oC	Nil
23	2.1.3	1/2	Portable photosynthesis system	1	30,000	30,000	Plant Physiology Jose Kallarackal	Infra red gas analyzer	Measure photosynthesis	To measure photosynthesis	Artificial light source	Li-6400	Li-Cor, USA	50x25x35 cm	0.1 micromoles	Nil
24	2.1.9	1/2	Sap flow gauges	1	6,000	6,000	Plant Physiology Jose Kallarackal	Heat pulser	Water flow in trees	To measure sap flow	with heat pulse generator	Heat pulse system	Edwards, New Zealand	Field use	0.01 litres	Nil
25	2.1.4	1/2	Canopy Analyzer	1	3,500	3,500	Plant Physiology Jose Kallarackal	Leaf area index meter	Leaf area in a forest	To measure leaf area index	One reference sensor	Li-2000	Li-Cor, USA	50x25x35 cm	95% accuracy	Nil
26	2.1.5	1/1	Time Domain Reflectometer	1	4,000	4,000	Plant Physiology Jose Kallarackal	Moisture Point	Soil moisture	To measure soil moisture	1.2 m sensor	Most recent model	Environmental sensor,	120x2x2 cm	95% accuracy	Nil
27	2.1.10	1/3	Plant growth chamber	1	20,000	20,000	Plant Physiology Jose Kallarackal	Plant growth chamber	Growing plants	To grow seedlings under controlled	Temp, RH and Light control	To be specified	Hereus, Japan	1500x500x500 cm	0.1oC accuracy	Nil
28	2.1.7	2/1	Red/far red sensor	1	4,000	4,000	Plant Physiology Jose Kallarackal	Red/far red sensor	Measure red/far red ratio	To provide artificial light conditions	Sensor only	To be specified	Skye Instruments,	3x3x3 cm	95% accuracy	Nil
29	2.1.7	2/1	Cepto-meter	1	5,000	5,000	Plant Physiology Jose Kallarackal	Ceptometer	Measure PAR		Sensor with logger	Accupar	Decagon Instruments, USA	15x10x3 cm	95% accuracy	Nil
30	2.2.5	1/2	PCR System	1	7,500	7,500	Pathology- C. Mohanan	Thermal Cycler	DNA amplification	To determine genetic diversity in AM & ECM fungi	96-wellsample block module	PCR System 9700	Applied Biosystem Inc., USA			
31	2.2.5	1/2	Horizontal Gel Electrophoresis	1	1,250	1,250	Pathology- C. Mohanan	Electrophoresis equipment	DNA fragment separation	Mycorrhizal identification at	12 lane	GT Minisubcell	Apelex, France			
32	2.2.7	1/3	Incubator - Shaker	1	3,500	3,500	Pathology- C. Mohanan	Refrigerated Horizontal shaker	Cultures of Mycorrhizal fungi	Mycorrhizal identification, inoculum			Fine-PCR, Korea			
33	2.2.5	2/2	Gel Documentation System	1	10,500	10,500	Pathology- C. Mohanan	With digital camera	DNA profile documentation		With digital camera		Biosystematica, UK			
34	2.2.3	2/1	Research Microscope	1	17,300	17,300	Pathology- C. Mohanan	Research Microscope with photographic attachment	Microscopic observation, photomicrography	Mycorrhizal association	Bright field, dark field, polarization, interference with Vario-Orthomat	Leitz	Leitz, Germany			
35	2.2.1	2/1	Cryomicrotome - Blade holder and disposable blades	1	1,000	1,000	Pathology- C. Mohanan	Cryomicrotome-knife holder	Microtomy of fungal & plant tissues	Mycorrhizal association	Knife holder and blades	Leitz	Leitz, Germany			
36	2.3.2	1/2	Laser Diffraction Particle Size analyser	1	20,000	20,000	Soil Science - Thomas P. Thomas	Particle size analyzer	Soil separates	To determine soil test	0.1 to 2000 mm	SALD-3001	Shimadzu Scientific Instruments Tokyo	1000(W) x 800 (D)		

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														Spatial Dimension	Control Range	Installation Charge (Rs.)
37	2.3.2	1/1	Pressure plate apparatus	1	16,000	16,000	Soil Science, Dr. Thomas P Thomas	Pressure plate apparatus	Soil water potential	Soil water potential	0 to 15 bar	Pressure plate apparatus	Earth Systems Solutions, Lompoc, California			
38	2.3.2	1/1	Equitensio-meter	1	4,600	4,600	Soil Science, Dr. Thomas P Thomas	Tensio-meter	Soil moisture tension	Soil moisture tension	0 to -1000 kPa	Equitensio-meter	Delta-T Devices,	190mm x 40mm		
39	2.3.3	2/1	Soil moisture probe	2	500	1,000	Soil Science, Dr. Thomas P Thomas	Soil	Soil moisture content	Soil moisture		Soil moisture probe	Forestry Suppliers, Inc. USA	470 mm		
40	3.2 & 3.3 all	2/2	Horizontal gel electrophoresis	1	2,500	2,500	Pathology- M Balasundaran	Electro-phoretic equip-ment	DNA fragment separation	To determine level of inbreeding & genetic diversity		Wide Sub cell GT	Bio-Rad, USA			
41	3.1.2, 3.1.6, 3.2 all, 3.3 all	1/1	Gel Doc. System	1	10,500	10,500	Pathology- M Balasundaran	Electro-phoretic gel docume-ntation system	Documentation & analysis of DNA finger prints	To determine level of inbreeding & genetic diversity	Digital camera with >4 million pixel resolution		Biosy-stem-atica, UK			
42	3.0 all	2/1	Gene sequencer	1	82,000	82,000	Pathology- M Balasundaran	Nucle-otide sequ-encer	Seque-ncing nucle-otides of microsatellite	To determine level of inbreeding & genetic diversity	Single capillary	ABI Prism 310 Genet-ic Analy-zer	App-ied Bios-ystems,USA	Single capil-lary		
43	3.0 all	1/1	Deep Freezer	1	6,000	6,000	Pathology- M Balasundaran	Freezer	To store DNA and enzymes	To determine level of inbreeding & genetic diversity	Cooling upto -70C		Sanyo, Japan			
44	3.0 all	1/1	Ice Machine	1	2,200	2,200	Pathology- M Balasundaran	Ice flakes maker	Produc-tion of ice flakes to keep eppendorf tubes	To determine level of inbreeding & genetic diversity			SIMAG Italy			
45	3.0 all	1/1	UV-spectrophotometer	1	6,500	6,500	Pathology- M Balasundaran	Spectro-photometer	Analytical Estimation of DNA	To determine level of inbreeding & genetic diversity			CECIL, UK			
46	3.1.2	1/1	Laminar Flow cabinet	1	2,000	2,000	Pathology- M Balasundaran	Sterile air flow chamber	Sterile working table	To determine level of inbreeding & genetic diversity			Kienz-aids, India			
47	3.0 all	1/1	Ultrapure water system	1	5,200	5,200	Pathology- M Balasundaran	Water purification plant	Ultra pure water source for Gene sequen-cing	To determine level of inbreeding & genetic diversity		Milli-Q	Millipore, USA			
48	3.0 all	1/1	Desk top Computer and statistical packages	1	3,000	3,000	Pathology- M Balasundaran	PC and statistical softwares	Estimation of inbreeding coefficient and genetic diversity	To determine level of inbreeding & genetic diversity			Compaq India			
49	3.2.2, 3.3.2	2/2	Incubator-shaker	1	4,000	4,000	Pathology- M Balasundaran	incubator with shaker inside	Incubation of vector for cloning	To determine level of inbreeding & genetic diversity	4C - 60C		Bio-system-atica, UK			

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														Spatial Dimension	Control Range	Installation Charge (Rs.)
50	4.1.1	1/1	Scanning Probe microscope	1	120,000	120,000	Wood Science Divn - KV Bhat	SEM	Plant tissue structure	Microscopic examination	Image mode STM, electrochemical contact mode AFM Scanning range min 80mm	PICO	Molecular Imaging, USA	Table top computer	A/C room	Free
51	4.1.2	1/1	Increment borers	2	500	1,000	Wood Science Divn - KV Bhat	Increment borer	Wood sample	Collection of core samples	Borer bit 0.512mm 30cm long, spare bit and honing	Haglof	Haglof, Sweden	35cm	Nil	Nil
52	4.2.1	1/2	HPLC	1	30,000	30,000	NWFP- N. Sasidharan	Chromatography	Protein, Amino Acid, etc	Chemical compound detection		HP 1100	HP			
53	4.2.1	1/2	Sample	1	2,500	2,500	NWFP- N. Sasidharan	Sample				Microlab 500	Hamilton			
54	4.2.1.4.2.2	1/2	Fume hood	1	2,500	2,500	NWFP- N. Sasidharan	Sample processing	Expelling noxious		1 x 1.5 m	Labline	Labline			
55	4.2.3	1/3	Sample Distillation Unit	1	1,250	1,250	NWFP- N. Sasidharan		Qualitative determination of Fats,	Determining fats, wax, resin, etc.		Cleveland Apparatus	Coming			
56	4.2.1	1/2	PH Meter	1	1,250	1,250	NWFP- N. Sasidharan		PH of solutions	Measuring Ph of		Eutech	Eutech			
57	4.2.3	1/3	Deep Freezer	1	1,250	1,250	NWFP- N. Sasidharan	Storage		Storage of sample for analysis	Minus 200C	Blue Star	Blue Star			
58	4.2.1	1/2	Distillation unit	1	8,000	8,000	NWFP- N. Sasidharan	Distill water		For determining	HPLC grade water	MilliQ	Millipore			
59	4.2 all	1/2	Analytical	2	2,500	5,000	NWFP- N. Sasidharan	Balance	Weight determination	Weighing samples	0.1 mg	Sartorius	Sartorius			
60	4.2 and 4.3 all	1/2	Fat/oil determinator	1	4,000	4,000	NWFP- N. Sasidharan		Quantitative analysis of fats and oil	Analysis		TFE 200	LECO			
61	4.2 all	1/2	Laboratory chamber	1	2,500	2,500	NWFP- N. Sasidharan			Ashing samples			Scientific Enterprise			
62	4.2 all	1/2	Turbidity meter	1	5,000	5,000	NWFP- N. Sasidharan			Determining total soluble salt	2000 AN	Hach	Hach			
63	4.2 all	1/2	Micropipette	5	2,500	12,500	NWFP- N. Sasidharan			Sample analysis	0.0001-10 ml	Brand	Emerk			
64	5.3	2/3	Deep Freezer	3	500	1,500	Silviculture- KC									
65	5.3	2/3	Germination Room	1	2,600	2,600	Silviculture- KC Chacko									
66	5.4	2/3	Nursery	2	5,000	10,000	Silviculture- KC									
67	5.4	2/3	Irrigation	2	4,000	8,000	Silviculture- KC									
68	5.4	2/3	Weather station	2	3,000	6,000	Silviculture- KC									
69	5.4	2/3	Shade net	2	1,000	2,000	Silviculture- KC									
70	5.3	2/3	Oven	2	500	1,000	Silviculture- KC									
71	5.5.1	1/1	Ultra Pure water system	1	7,300	7,300	Genetics, EM Muralidharan	High quality water purification system		For production of high purity grade water for media preparation and DNA work	HPLC grade water	Milli-Q	Millipore Ltd.	1 m X 1 m		
72	5.5.1	1/1	Media dispenser	1	1,000	1,000	Genetics, EM Muralidharan	Automatic dispensing of		For precise and convenient dispensing		Pourboy		0.5 m X 0.5 m		
73	5.5.1	1/1	Glassware washer	1	6,000	6,000	Genetics, EM Muralidharan	Automatic Glassware cleaner/washer		To wash glassware used in media preparation and		Miele	Miele	1m X 1.m		

List of Proposed Equipment in the Project - Conservation of RET tree species - KFRI KFD

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Serial No.	Activity No.	Time of Purchase (half / year)	Name of Equipment	No. of Equipment (s: set)	Unit Price (US\$)	Total Price (US\$)	Using Div & Person In Charge	Function-Based Name	Analytic Use of the Equipment	Using Purpose (Specific for Project)	Specification	Brand Name	Manufacturer's Name	Remarks		
														Spatial Dimension	Control Range	Installation Charge (Rs.)
74	5.5.1	1/1	Deep Freezer	1	6,500	6,500	Genetics, EM Muralidharan	-80 °C Freezer		For long term storage of embryos, tissues, Storage of chemicals		Sanyo	Sanyo	1 m X 1.5m X 2 m.		
75	5.5.1	1/2	Bioreactor System	1	22,500	22,500	Genetics, EM Muralidharan	Air lift Bioreactor for plant cultures		For maintenance of cell and tissue cultures	Air lift fermentor with pH, DO and antifoam control	MTR	Applikon	1 m X 0.5 m		
76	5.5.1	1/2	Thermostatic circulator	1	2,000	2,000	Genetics, EM Muralidharan	Thermostatic bath /circulator		For preculture of tissues and cultures, cooling of fermentor	-5 to 30 C	Grant	Grant UK	1 m X 0.5 m		
77	5.5.1	1/2	Peristaltic pump	1	2,000	2,000	Genetics, EM Muralidharan	Programmable Peristaltic pump		For media recirculation in Liquid tissue culture system		Jouan	Jouan	Table top		
78	5.5.2	1/1	Mist Propagation unit /hardening unit	1	20,000	20,000	Genetics, EM Muralidharan	Mist propagation cum hardening unit with humidity and light control		For hardening of micropropagated and production of rooted cuttings		Local fabrication (modification of existing)		15 m X 4 m X 3 m (X 2 nos)		
79	5.5.3	1/1	Electronic Balance	1	1,000	1,000	*			Precision Weighing		Sartorius				
80	5.5.3	1/1	Computer	1	1,500	1,500	*			Data Analysis		Siemens				
81	6.1	1/4	Green house	1	2,500	2,500	Silviculture- KC									
82	6.2	2/1	Cryopreservation System	1	22,000	22,000	Genetics, EM Muralidharan	Liquid Nitrogen based controlled freezing and		To cryopreserve cultured tissues and embryos for long term		Planer	Planer	2 m X 1 m X 2 m		
83	7.1	1/2	Vsat equipment	1	4,000	4,000	Silviculture- KC									
84	7.1	1/2	Video Conferencing equipment	2	10,000	20,000	Silviculture- KC Chacko									
85	7.1	1/2	LCD	3	3,000	9,000	Silviculture- KC									
86	7.1	1/2	OHP	4	500	2,000	Silviculture- KC									
87	7.1	1/2	Photocopier	2	5,000	10,000	Silviculture- KC									
88	7.1	1/2	Display unit	2 S	3,000	6,000	Silviculture- KC									
89	7.1	1/2	Public audio system (fixed)	2 S	2,000	4,000	Silviculture- KC Chacko									
90	7.1	1/2	Video camera & accessories	2 S	6,000	12,000	Silviculture- KC Chacko									
91	9.1.1	2/1	Computer	8	12,000	96,000	KFRI- Jose Kallarackal	Desktop computer	Computing and analysis	Analysis and processing of data	Pentium IV	Latest	Compaq or HP or IBM			
92	9.1.1	2/1	Computer	2	5,000	10,000	KFRI- Jose	LAN Printer	Printing	Document printing	High quality Laser	Latest model	HP			
93	9.1.1	1/3	Video Conferencing equipment	1	5,000	5,000	KFRI- Jose Kallarackal	Video Conference Equipment	Conferencing	To maintain more international contact		Latest				

List of Proposed Equipment in the Project - Conservation of RET tree species - KFRI KFD

Serial No.	Activity No.	Time of Purchase (half / year)	Name of Equipment	No. of Equipment (s. set)	Unit Price (US\$)	Total Price (US\$)	Using Div & Person in Charge	Function-Based Name	Analytic Use of the Equipment	Using Purpose (Specific for Project)	Specification	Brand Name	Manufacturer's Name	Remarks		
														Spatial Dimension	Control Range	Installation Charge (Rs.)
94	9.1.1	1/1	General Software	1 S	5,000	5,000	KFRI- Jose Kallarackal	Licensed software for secretarial work	Documentation	General use in the project	Office function, Statistics & Graphics software for Network use	Latest versions				
95	9.1.1	1/1	V-sat equipment	1	3,500	3,500	KFRI- Jose Kallarackal	V-sat technology for Internet	Access Internet faster	Easy access to Internet for the project		D-link				
96	9.2.1	1/1	LCD projector	1	3,500	3,500	KFRI- Jose	Projector	Lectures and	Conducting workshops		Optima				
97	9.2.1	1/1	OHP	1	800	800	KFRI- Jose	Overhead Projector	Lectures and	Conducting workshops		Godrej				
98	9.2.1	1/1	Public audio system (fixed)	1	3,000	3,000	KFRI- Jose Kallarackal	Microphone and amplifier	Lectures and workshops	Conducting workshops etc		Local				
99	9.2.1	1/1	Laptop	2	2,600	5,200	KFRI- Jose	Computer	Connecting to LCD	Conducting workshops	Pentium IV	Compaq				

Total	950,404	US\$
	124.00	J yen/ US\$
総額	117,850,096	円

別添7：参加型計画ワークショップ

- 7-1. ワークショップのプログラム
- 7-2. ワークショップの出席者リスト
- 7-3. 参加者分析の結果 (1) 参加者の類型化
- 7-4. 参加者分析の結果 (2) 詳細分析
- 7-5. 問題分析の結果
- 7-6. 目的分析及びプロジェクトの選択の結果
- 7-7. プロジェクトの枠組み及びKFRIとの協議に基づくプロジェクトの要約
- 7-8. 活動計画 (PO) 仮案
- 7-9. 詳細活動計画仮案

別添 7-1: ワークショップのプログラム

(1) First Day (13 November 2002)

9:30-9:45	Opening remarks Self introduction of the participants
9:45-10:15	Introduction of the workshop methods
10:15-13:00	Participation Analysis -Categorization of the stakeholders -Detailed Analysis
13:00-14:00	Lunch Break
14:00-16:30	Problem Analysis -Explanation -Selection of a core problem -Identification of direct causes and effects -Development of a problem tree
16:30-16:45	Tea Break
16:45-18:00	Continuation of development of a problem tree

(2) Second Day (14 November, 2002)

9:30-9:45	Review of the previous day
9:45-11:00	Continuation of development of a problem tree
11:00-13:00	Objectives Analysis -Development of an objective tree
13:00-14:00	Lunch Break
14:00-15:00	Continuation of development of an objective tree
15:00-15:45	Alternatives Analysis and formulation of Narrative Summary
15:45-16:00	Conclusion and closing remarks

別添7-2: ワークショップの出席者リスト

(1) First Day (13 November, 2000)

Kerala Forest Research Institute(KFRI)

Dr. J.K. Sharma, Director
Dr. R. Gnanaharan, Research Coordinator
Dr. N. Sasidharan, Scientist (Plant Taxonomy)
Mr. K.C. Chacko, Silviculturalist
Dr. M. Balasundaran, Scientist (Pathology/Mol Biology)
Dr. K. Swarupanandan, Scientist (Ecology)
Dr. Jose Kallarackal, Scientist (Plant Physiology)

Kerala Forestry Department (KFD)

Mr. Nagesh Prabu, Conservator of Forests, Central Circle
Mr. Anthony Joseph, Deputy Conservator of Forests, Research
Dr. N.C. Induchoodan, Divisional Forest Officer, Vazhachal Division

Japan International Cooperation Agency (JICA)

Ms. Emiko Mutsuyoshi, Leader
Mr. Yosuke Matsumoto
Mr. Shuichi Miyabe
Mr. Masato Yoneda
Ms. Noriko Ishibashi

(2) Second Day (14 November, 2002)

KFRI

Dr. J.K. Sharma, Director
Dr. R. Gnanaharan, Research Coordinator
Dr. N. Sasidharan, Scientist (Plant Taxonomy)
Mr. K.C. Chacko, Silviculturalist
Dr. M. Balasundaran, Scientist (Pathology/Mol Biology)
Dr. K. Swarupanandan, Scientist (Ecology)
Dr. Jose Kallarackal, Scientist (Plant Physiology)

KFD

Mr. Anthony Joseph, Deputy Conservator of Forests, Research
Dr. N.C. Induchoodan, Divisional Forest Officer, Vazhachal Division
Mr. Noyal Thomas, Divisional Forest Officer, Malayaltor Division

JICA

Ms. Emiko Mutsuyoshi, Leader
Mr. Yosuke Matsumoto
Mr. Shuichi Miyabe
Mr. Masato Yoneda
Ms. Noriko Ishibashi

別添 7-3:参加者分析の結果 (1) 類型化

The persons, groups, organizations and institutions related to or affected by a project on conservation of forest ecosystem, in particular, rare, endangered and threatened tree species.

Beneficiaries	Decision Makers	Implementing Agencies	Supporting Groups	Potential Opponents	Funding Agency	External Interventions
<ul style="list-style-type: none"> ▫ Farmers ▫ Local residents ▫ Future generations ▫ Tourists ▫ Visitors to forests ▫ Conservationists (world around) ▫ Gene banks ▫ Tree breeders ▫ Private nurseries ▫ Forest industries ▫ Tribals ▫ Forest tribals ▫ Ayurveda practitioners ▫ FRLHT (Foundation for Revitalization of Local Health Treatment) 	<ul style="list-style-type: none"> ▫ MOEF,GOI ▫ KFD ▫ VSS of PFM Programmes ▫ State Board for Medicinal Plants ▫ State Plan Board (WGDP) ▫ STED ▫ Kerala Biodiversity Board(to be constituted) 	<ul style="list-style-type: none"> ▫ KFD ▫ KFRI ▫ Tropical Botanic Garden & Resources Institute ▫ CESS ▫ MS Swaminathan Research Foundation ▫ Calicut Univ. ▫ Kerala Univ. ▫ Univ. of Agr. ▫ BSI, GOI ▫ IFGTB (ICFRE) ▫ Dept. of Space(RS) ▫ French Institute 	<ul style="list-style-type: none"> ▫ MOEF ▫ KTDC ▫ Dept. of Space(RS) ▫ Other Research Institute ▫ NGO ▫ NBPGR ▫ Centre for Water Resources Development & Management ▫ Dept. of Planning(WGDP) ▫ CESS, TVM ▫ Environmental Scientists ▫ VSS ▫ Kerala Landuse Board ▫ World Bank ▫ BSI ▫ Developed countries ▫ DBT, GOI ▫ Other States of the WGs ▫ Indian Institute of Spices Research (Calicut) ▫ Gurukulam Sanctuary-Wayana d(NGO) ▫ DST, GOI ▫ Min. of Sci. & Tech., GOI ▫ Forest and/or Envi. Research Institutes in JPN 	<ul style="list-style-type: none"> ▫ Pilgrimages ▫ Forest settlements(Non tribal) ▫ Encroachers ▫ Industry ▫ Timber contractors ▫ Pulp mills ▫ Illicit brewers ▫ Poachers ▫ 'Ganja' cultivators ▫ Developed countries 	<ul style="list-style-type: none"> ▫ MOEF,GOI ▫ DST, GOI ▫ DBT, GOI ▫ GEF, WB ▫ GOI & GOK ▫ ACIAR(Australia) ▫ Dept. of Planning and Economic Affairs, GOK ▫ JICA ▫ WWF 	<ul style="list-style-type: none"> ▫ Judiciary(High Court) ▫ Journalists ▫ Mass media ▫ Other states of the WGs ▫ KFD ▫ Industries ▫ Downstream industry ▫ Institutions for environmental education

別添 7-3:参加者分析の結果 (1) 類型化

Beneficiaries	Decision Makers	Implementing Agencies	Supporting Groups	Potential Opponents	Funding Agency	External Interventions
			<ul style="list-style-type: none"> ▫ Gov. of Japan ▫ JICA ▫ Forestry Agency of Japan ▫ IUCN ▫ School children ▫ TATA TEA & Large Plantations 			

NBPGR National Bureau for Plant Genetic Resources
FRLHT Foundation of Rehabilitation of Local Health Treatment
CESS Centre for Earth Science Studies
BSI Botanical Survey of India
VSS Village Protection Committees
IFGTB Institute of Foreign Genetic Tree Breeding
KTDC Kerala Tourism Development Corporation
TBGRI Tropical Botanic Garden Resources Institute
DST Department of Science & Technology
DBT Department of Bio-Technology
ACIAR Australian Cooperation Institute for Agricultural Resources

Annex 4: Results of Stakeholder Analysis (2) Detailed Analysis

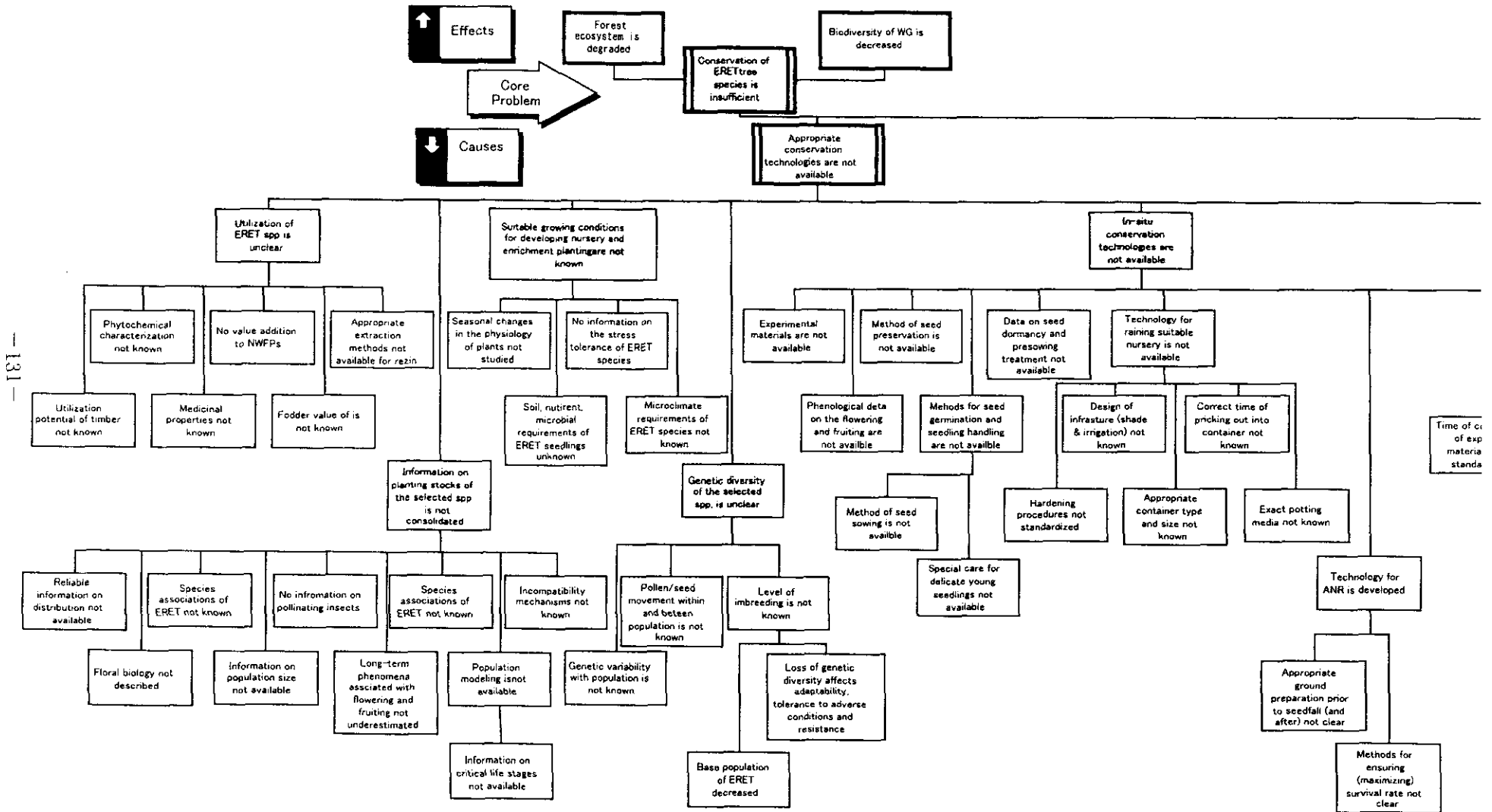
(1) Detailed Analysis of KFD

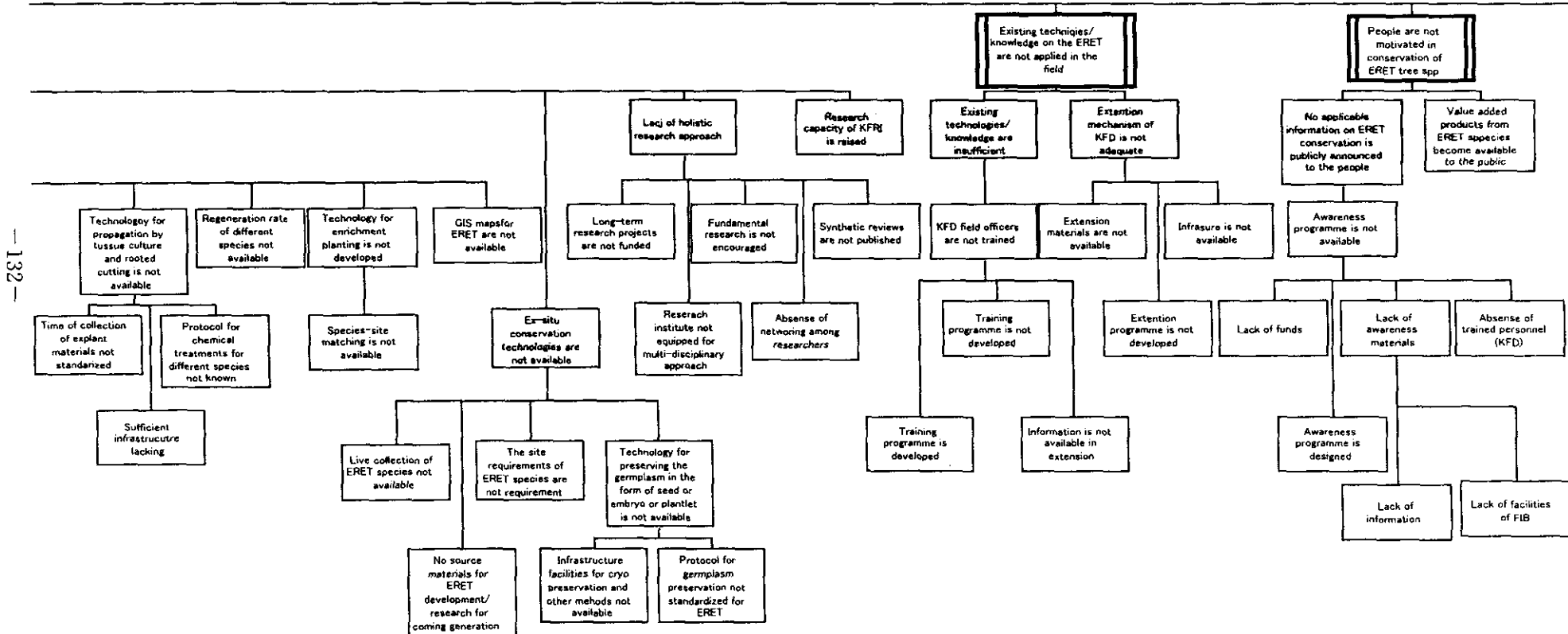
Interests	Strengths	Weakness	Potential	Implication
<ul style="list-style-type: none"> ▫ Developing Knowledge Base (Data Collection) ▫ Biodiversity Conservation ▫ Economic Returns ▫ Sustainable utilization of RET tree ▫ Sustainable Production of NWFP & Industrial Wood ▫ Environmental Education ▫ PFM ▫ Promoting Broader Resource Base ▫ Management of Forest Lands ▫ Funding Forestry Research ▫ Promotion of Agroforestry 	<ul style="list-style-type: none"> ▫ Custodian of Land ▫ Existence of a Research Wing ▫ Legally empowered ▫ Conservation Mandate ▫ Fit for Tough & Large Scale Field Work ▫ Trained & Dedicated & Disciplined Staff ▫ Research Link with KFR ▫ Rich Information ▫ On-site Knowledge Source ▫ Access to Resource ▫ Man Power (Larger) ▫ Can Undertake Large Scale Fieldwork & Afforestation with People Participation ▫ Infrastructure for Regular Monitoring & Evaluation 	<ul style="list-style-type: none"> ▫ Lack of Precise Research Skill and Technology ▫ Lack of Sufficient Financial Resource ▫ Political Interference in Staff Positioning ▫ Frequent Transfer of Staff ▫ Insufficient Infrastructure ▫ Lack of Research Facilities ▫ Strict Hierarchy ▫ Poor Delegation of Financial Power ▫ Lack of Training in Biodiversity Conservation ▫ Lack of Institutional Incentives ▫ Lack of International Exposure 	<ul style="list-style-type: none"> ▫ Thorough Field Knowledge ▫ On-Site Information Source on Key Species Distribution ▫ Can Make Suitable Changes in Policies ▫ Administratively Affordable Approach ▫ Cooperation with Other National/International Organizations ▫ Public Awareness about the Extension Activities ▫ Enhance KFD's Research Base 	<ul style="list-style-type: none"> ▫ Enrich Knowledge & Resource Base ▫ A Model Scheme Available for RET Conservation & Utilization ▫ Realization of Optimal Measures ▫ Follow Up Support ▫ Package of Nursery & Planting Techniques ▫ RET Species/Ecosystems Conserved ▫ Improved Standard of Living ▫ Sustainable Utilization of Resources ▫ Prevent Extinction of Species ▫ Awareness

Annex 4: Results of Stakeholder Analysis (2) Detailed Analysis

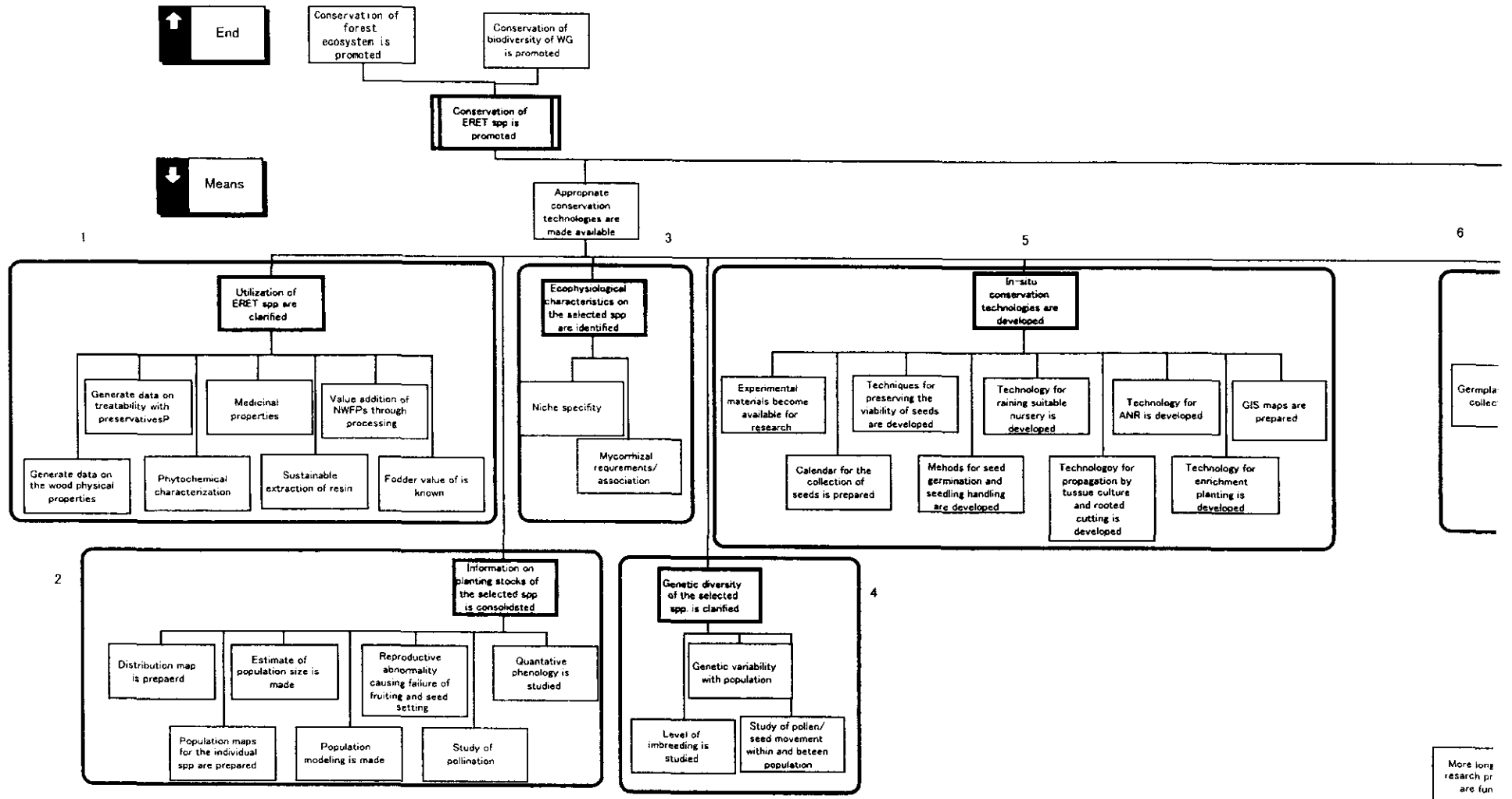
(2) Detailed Analysis of KFRI

Interests	Strengths	Weakness	Potential	Implication
<ul style="list-style-type: none"> ▫ Make KFRI a Leading Institution in Tropical Forestry ▫ Forest Tree Biodiversity ▫ Conservation of RET Tree Species ▫ Evaluation of Potential Uses of Timber & Medicinal Plants ▫ Ex situ & In situ Conservation ▫ Bioinformation, Population / Population/Biology/ Genetics, Ecology, Biodiversity, Measuring Valuation, Seed/Vegetative Propagation ▫ Technology for Nursery & Plantations ▫ Training on Forest Products – Value Addition of Non-Wood Forest Products ▫ Impart Training to Stakeholders in Knowledge, XX Developing Countries ▫ International Training Programme in Tropical Forest ▫ Study Ecophysiology of RET Species ▫ Reproductive Biology ▫ Sustainable Utilisation of Forest Resources 	<ul style="list-style-type: none"> ▫ Functional Autonomy of KFRI ▫ Expertise in Tropical Forestry ▫ Expertise in Different Subjects (Botany, Ecology, Genetics, Economics) ▫ Highly Educated Researchers ▫ Knowledge on Occurrence of the RET Species ▫ Experts on Several Groups ▫ Good Access to Highly Qualified Natural Resources (in Western Ghats) ▫ Relatively Good Infrastructure ▫ Rich Reference Herbarium ▫ Library Information Access ▫ Electronic Database on Flora & Fauna ▫ Existence of Monitoring & Evaluation Unit ▫ Time-Bound Approach Experience (Project-based) ▫ Multi-disciplinary Approach ▫ MOU/Contacts with Int'l Agencies & Organization ▫ Successfully Completed Projects Funded by International Funding Agencies ▫ Good Relation with Government Agencies ▫ Close Linkage with KFD through Research Approval Committee (RAC) ▫ Rapport with NGOs 	<ul style="list-style-type: none"> ▫ Lack of Adequate Resources ▫ Lack/Poor/Old Equipment for Research ▫ Short Duration of Projects ▫ No Long-term Project Plan on RET Plants Now ▫ Slow Growing Trees Delay Results of Research ▫ Official Delays in Decision Making ▫ Lack of Office Automation ▫ Mechanism of Extension not Adequate ▫ Field Logistic Support/Infrastructure ▫ Absence of Int'l Programme for Conservation of RET ▫ Lack of Funding for Conservation of Biodiversity ▫ Lack of Int'l Experts/Exposure/Interactions ▫ Information Flow inadequate ▫ Lack of Guest House Facility for Training Programme ▫ Funding of Training Programme ▫ Inadequate Expertise in Biotechnology, Certain Areas: GIS, Phytochemistry, Ecophysiology ▫ Lack of Knowledge on Biology, Ecophysiology, Genetics, Propagation & Conservation of RET ▫ Expertise & Equipment of Phytochemical Characterisation, Bioprospecting ▫ GIS – Training, Expertise, Staff & Hardware ▫ Ecophysiology – Microclimate Photosynthesis Stress tolerance, Water Relations ▫ Biotechnology Training/Expertise & Exposure in DNA Fingerprinting - Equipment ▫ Lack of Large & Modern Experimental Nursery ▫ Doubtful Financial Support for Seed Centre After Project Period ▫ Poor Transportation for Research (4WD) ▫ Project Completion ▫ Poor Social Infrastructure Electricity & Water ▫ Lack of Good Access to Internet Facilities ▫ Inadequacy of Number of Young Researchers (Fellows etc.) ▫ Lack of Technical Support (Technical Assistance) in Projects 	<ul style="list-style-type: none"> ▫ Initiate Scientific Conservation in Kerala ▫ Centre of Excellence in Forest Conservation/Biodiversity ▫ Get Funding For Research ▫ Support To KFD & Other Agencies ▫ Receive Training From International Experts ▫ To Develop Precise Maps of RET Species Distribution ▫ To Give Training TO Various Stakeholders ▫ Improve Infrastructure /Equipment of KFRI ▫ Encourage Collaboration Research with International Experts ▫ Enhance Research Expertise in Conservation of RET 	<ul style="list-style-type: none"> ▫ Conservation of RET ▫ Increase in Base Population ▫ Follow Up Support for Continuing the Work on RET ▫ Meeting the Needs of Various Stakeholders ▫ Training for Forests/Researchers ▫ Information Exchange between Other Research Institutes in Other Countries (SEAsia) ▫ Database Accumulation ▫ Knowledge on Survival of Species in Small Populations ▫ Package of Practices for Nursery, Plantation & Technology for Ex situ & in situ Conservation





別添7-6: 目的系図及びプロジェクトの選択-1/2



別添 7-7:プロジェクトの枠組及び KFRI との協議に基づく
プロジェクトの要約 (仮案 2 : 2002/11/27 版)

Narrative Summary (仮訳)	
Overall Goal:	Conservation of forest ecosystem in the Western Ghats in Kerala is promoted. ケララ州西側ガーツの森林生態系保全が促進される。
Project Purpose:	Conservation of rare, endangered and threatened (RET) tree species of the Western Ghats in Kerala is promoted. ケララ州西側ガーツの稀少種・絶滅危惧種・絶滅寸前危惧種 (RET) 樹種の保全が促進される。
Outputs:	<ol style="list-style-type: none">1. Information on potential of planting stocks of the selected RET tree species¹ is enriched (by KFRI). 選択された RET 樹種の苗木の可能性に関する情報が (KFRI によって) 改善される2. Ecophysiological characteristics of the selected RET tree species are identified (by KFRI). 選択された RET 樹種の生態生理学的特性が (KFRI によって) 解明される3. Genetic diversity of the selected RET tree species is understood (by KFRI). 選択された RET 樹種の遺伝的多様性が (KFRI によって) 解明される4. Utilization potential of the selected RET tree species is clarified (by KFRI). 選択された RET 樹種の利用が (KFRI によって) 明確にされる5. Technologies on <i>in-situ</i> conservation for the selected RET tree species are developed (by KFRI/KFD). 選択された RET 樹種について生息域内保全技術が (KFRI/KFD によって) 開発される6. Technologies on <i>ex-situ</i> conservation for the selected RET tree species are developed (by KFRI). 選択された RET 樹種について生息域外保全技術が (KFRI によって) 開発される7. Existing knowledge and techniques for introducing RET tree species in natural forest are applied in the field for their conservation and rehabilitation (by KFD/KFRI). RET 樹種の保全と復旧を目的として自然林に導入するための既存の知識と技術が (KFD/KFRI) によって現場に適用される8. Public awareness on conservation of RET tree species is created (by KFD/KFRI). RET 樹種に関する人々の意識が (KFD/KFRI) によって形成される9. Project results are disseminated locally, nationally and internationally (by KFRI/KFD). プロジェクトの成果が (KFRI/KFD) によってケララ州内、インド国内、国際的に広められる

¹ 基礎研究と技術開発 (成果 1~6) 及びトライアル植林 (成果 7) のための RET 樹種の選定は KFD 及び他関連機関と協議の上、プロジェクト開始までに選定される。

Activities:

- 1-1 Prepare a distribution map for each species. 分布図を作成する
 - 1-2 Prepare a map of the populations of each species and its ecological associations. 各樹種の個体の分布及び生態学的関連性に関する地図を作成する
 - 1-3 Identify plant communities holding the selected species. 選択樹種のコミュニティを特定する
 - 1-4 Identify the reproductive abnormality causing failure of fruiting and seed setting for each species. 各樹種の低い結果及び種子充実率を招く再生産異常原因を解明する
 - 1-5 Estimate population size for each species. 各樹種の群落サイズを推定する
 - 1-6 Estimate the role of pollinators for each species. 各樹種のポリネーターの役割を推定する
 - 1-7 Prepare a calendar for the collection of seeds for each species. 各樹種の種子収集カレンダーを作成する
 - 1-8 Prepare strategies for technology development and technical reports on biological aspects. 生物学的側面からみた保全技術開発戦略及び技術レポートを作成する
-
- 2-1 Identify niche specificity of each species. 各樹種のニッチ特性を解明する。
 - 2-2 Identify mycorrhizal requirements and associations for each species. 各樹種の共生要求度及び関連性を解明する
 - 2-3 Identify soil and nutrient requirements for each species. 各樹種の土壌・栄養要求度を解明する
 - 2-4 Investigate storage and germination physiology of seeds for each species. 各樹種の種子の保存及び発芽生理学を調べる
 - 2-5 Prepare strategies for technology development and technical reports on ecophysiological aspects. 生態生理学的側面からみた保全技術開発戦略及び技術レポートを作成する
-
- 3-1 Determine the level of inbreeding for each species. 各樹種の近親繁殖レベルを決定する
 - 3-2 Determine pollen/seed movement within and between populations for each species. 各樹種の群落内・群落間の花粉・種子移動を決定する
 - 3-3 Assess genetic variability in the population for each species. 各樹種の群落内の遺伝的多様性を評価する
 - 3-4 Prepare strategies for technology development and technical reports on genetic aspects. 遺伝学的側面からみた保全技術開発戦略及び技術レポートを作成する
-
- 4-1 Measure wood properties for each species. 各樹種の木材特性を計測する
 - 4-2 Identify phytochemical and medicinal properties for each species. 各樹種の植物化学的及び薬効特性を解明する
 - 4-3 Generate data on sustainable extraction of resin for the relevant species. 関連樹種について持続的ヤニ採取データを集積する
 - 4-4 Experiment on value addition of Non Wood Forest Products (NWFPs) for standardization of processing techniques for the relevant species. 関連樹種について加工技術の標準化のためにNWFPの付加価値づけの実験をする
 - 4-5 Assess fodder value for each species. 各樹種の飼料価値を評価する
 - 4-6 Prepare strategies for technology development and technical reports on utilization aspects. 利用の側面からみた保全技術開発戦略及び技術レポートを作成する

- 5-1 Collect experimental materials for each species. 各樹種の実験材料を収集する
- 5-2 Develop techniques for preserving the viability of seeds for each species. 各樹種の種子活性維持技術を開発する
- 5-3 Develop methods for seed germination and seedling handling for each species. 各樹種の種子発芽・苗木取扱方法を開発する
- 5-4 Develop technology for raising suitable nursery to produce maximum good quality seedling for each species. 各樹種の健苗生産技術を開発する
- 5-5 Develop technology for propagation by tissue culture and rooted cuttings for each species. 各樹種の組織培養及びルート・カッティングによる繁殖技術を開発する
- 5-6 Develop technology for assisted natural regeneration for each species. 各樹種の天然更新誘導技術を開発する
- 5-7 Develop technology for enrichment planting for each species. 各樹種のエンリッチメント・プランティング技術を開発する
- 5-8 Prepare GIS maps for each species. 各樹種の GIS 地図を作成する
- 5-9 Prepare strategies for technology development and technical reports on *in-situ* conservation. 生息域内保全に関する技術開発戦略及び技術レポートを作成する
-
- 6-1 Establish germplasm in 3 sites at different elevations. 標高の違う 3 箇所で母材料を収集する
- 6-2 Develop technology for preserving the germplasm in the form of seed, embryo or plantlet for each species. 種子、細胞集合体、または幼植物体の形態による母材料保存技術を開発する
- 6-3 Prepare strategies for technology development and technical reports on *ex-situ* conservation. 生息域外保全に関する技術開発戦略及び技術レポートを作成する
-
- 7-1 Implement training to KFD field officers. KFD 現場職員に研修を行う
- 7-2 Establish trial plot(s). トライアル・プロットを設置する
- 7-3 Plant trial RET species. トライアル用 RET 樹種を植林する
- 7-4 Record survival and growth of each species. 各樹種の生存と成長を記録する
- 7-5 Prepare strategies for technology development and technical reports on trial planting. トライアル植林に関する技術開発戦略及び技術レポートを作成する
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- 8-1 Implement trainer's training for KFD field officers. KFD 現場職員に対してトレーナー研修を行う
- 8-2 Prepare an awareness programme and materials. 意識形成プログラムと材料を作成する
- 8-3 Implement the awareness programme. 意識形成プログラムを実施する
- 8-4 Prepare technical reports on public awareness aspects. 意識形成側面に関する技術レポートを作成する
-
- 9-1 Publish the materials (guidelines, technical reports, etc.) prepared through the project activities, newsletters, etc. ガイドライン、技術レポート等のプロジェクトによって作成されたマテリアルやニュースレターを発行する
- 9-2 Organize workshops for dissemination of the project activities and/or results. プロジェクトの活動や結果を普及するためのワークショップを開催する

Objectives		Activities																
Objectives	Activities	KFR I				KFR II				KFR III				KFR IV				Remarks
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1 Information on potential of planting stocks of the selected RET tree species is enriched. 選択されたRET樹種の苗木の可能性に関する情報が(KFR IIによって)改善される	1.1 Prepare a distribution map for each species 分布図を作成する	X																Dr. K. Swarupananandan Dr. PV Nair (KFR I)
	1.2 Prepare a map of the populations of each species and its ecological associations 各樹種の個体の分布及び生態学的関連性に関する地図を作成する		X	X	X													Dr. K. Swarupananandan Dr. PV Nair (KFR I)
	1.3 Identify plant communities holding the selected species 選択樹種のコミュニティを特定する		X	X	X	X	X											Dr. K. Swarupananandan (KFR I)
	1.4 Identify the reproductive abnormality causing failure of fruiting and seed setting for each species 各樹種の低い結果及び種子充実率を招く再生産異常原因を説明する		X	X	X	X	X											Dr. E. P. Indira & Dr. K. Swarupananandan (KFR I)
	1.5 Estimate population size for each species 各樹種の群落サイズを推定する			X	X	X	X											Dr. K. Swarupananandan (KFR I)
	1.6 Estimate the role of pollinators for each species 各樹種のポリネーターの役割を推定する	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Dr. George Mathew & Dr. K. Mohandas (KFR I)
	1.7 Prepare a calendar for the collection of seeds for each species 各樹種の種子収集カレンダーを作成する	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Mr. KC Chacko (KFR I)
	1.8 Prepare strategies for technology development and technical reports on ecophysiological aspects 生物学的側面からみた保全技術開発戦略及び技術レポートを作成する											X					X	To be nominated (KFR I)
2 Ecophysiological characteristics of the selected RET tree species are identified (by KFR I). 選択されたRET樹種の生態生理学的特性が(KFR Iによって)解明される	2.1 Identify niche specificity of each species 各樹種のニッチ特性を解明する	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Dr. Jose Kallarackal & Dr. CK Somen (KFR I)	
	2.2 Identify mycorrhizal requirements and associations for each species 各樹種の共生要求度及び関連性を解明する	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Dr. C. Mohanan (KFR I)	
	2.3 Identify soil and nutrient requirements for each species 各樹種の土壌・栄養要求度を解明する	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Dr. Thomas P. Thomas & Dr. S. Kumaraswamy (KFR I)	
	2.4 Investigate storage and germination physiology of seeds 各樹種の種子の保存及び発芽生理学を調べる	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Mr. KC Chacko & Dr. Jose Kallarackal	
	2.5 Prepare strategies for technology development and technical reports on ecophysiological aspects 生態生理学的側面からみた保全技術開発戦略及び技術レポートを作成する										X					X	To be nominated (KFR I)	
3 Genetic diversity of the selected RET tree species is understood (by KFR I). 選択されたRET樹種の遺伝的多様性が(KFR Iによって)解明される	3.1 Determine the level of inbreeding 各樹種の近親繁殖レベルを決定する	X	X	X	X												Dr. M. Balasundaran (KFR I)	
	3.2 Determine pollen/seed movement within and between populations for each species 各樹種の群落内・群落間の花粉・種子移動を決定する					X	X										Dr. M. Balasundaran & Dr. EP Indira (KFR I)	
	3.3 Assess genetic variability in the population for each species 各樹種の群落内の遺伝的多様性を評価する								X	X							Dr. EP Indira & Dr. M. Balasundaran (KFR I)	
	3.4 Prepare strategies for technology development and technical reports on genetic aspects 遺伝学的側面からみた保全技術開発戦略及び技術レポートを作成する										X					X	To be nominated (KFR I)	
4 Utilization potential of the selected RET tree species is clarified (by KFR I). 選択されたRET樹種の利用が(KFR Iによって)明確にされる	4.1 Measure wood properties for each species 各樹種の木材特性を計測する	X	X	X	X	X	X										Dr. KV Bhat, Dr. R. Gnanaharan (KFR I)	
	4.2 Identify phytochemical and medicinal properties for each species 各樹種の植物科学的及び薬効特性を解明する		X	X	X	X											Dr. N. Sasidharan (KFR I)	
	4.3 Generate data on sustainable extraction of resin for the relevant species 関連樹種について持続的ヤニ採取データを累積する		X	X	X	X	X	X	X	X							Dr. N. Sasidharan (KFR I)	
	4.4 Experiment on value addition of NWFPs for standardization of processing techniques for the relevant species 関連樹種について加工技術の標準化のためにNWFPの付加価値づけの実験をする		X	X	X	X	X	X	X	X							Dr. N. Sasidharan (KFR I)	
	4.5 Assess fodder value for each species 各樹種の飼料価値を評価する		X	X	X	X											Dr. N. Sasidharan (KFR I)	
	4.6 Prepare strategies for technology development and technical reports on utilization aspects 利用の側面からみた保全技術開発戦略及び技術レポートを作成する										X					X	To be nominated (KFR I)	

Outcomes	Activities																				
5 Technologies on in-situ conservation for the selected RET tree species are developed (by KFR/I/KFD). 選択されたRET樹種について生息域内保全技術が(KFR/I/KFDI)によって開発される	5.1 Collect experimental materials for research 各樹種の実験材料を収集する	X	X	X	X	X	X	X	X											To be nominated (KFR/I)	
	5.2 Develop techniques for preserving the viability of seeds for each selected species 各樹種の種子発芽・苗木取扱方法を開発する								X	X	X	X								Mr. KC Chacko	
	5.3 Develop methods for seed germination and seedling handling for each species 各樹種の種子発芽・苗木取扱方法を開発する								X	X	X	X								Mr. KC Chacko & PKC Pillai	
	5.4 Develop technology for raising suitable nursery to produce maximum good quality seedlings for each species 各樹種の健苗生産技術を開発する								X	X	X	X								Mr. KC Chacko, Dr. RC Pandalar, DR. MP Sujatha, Dr. C Mohanan, Dr. George Mathew	
	5.5 Develop technology for propagation by tissue culture and rooted cuttings for each species 各樹種の組織培養及びルート・カッティングによる繁殖技術を開発する	X	X	X	X	X	X	X	X	X	X	X									Dr. EM Muralidharan & Dr. T Surendran
	5.6 Develop technology for assisted natural regeneration for each species 各樹種の天然更新誘導技術を開発する									X	X	X	X								Mr. KC Chacko, Dr. RC Pandalar
	5.7 Develop technology for enrichment planting for each species 各樹種のエンリッチメント・プランティング技術を開発する									X	X	X	X								Mr. KC Chacko, Dr. RC Pandalar (KFR/I)
	5.8 Prepare GIS maps for each species 各樹種のGIS地図を作成する	X	X	X	X	X															Dr. PV Nair (KFR/I)
	5.9 Prepare strategies for technology development and technical reports on in-situ conservation 生息域内保全に関する技術開発戦略及び技術レポートを作成する									X											To be nominated (KFR/I)
6 Technologies on ex-situ conservation for the selected RET tree species are developed (by KFR/I). 選択されたRET樹種について生息域外保全技術が(KFR/I)によって開発される	6.1 Establish germplasm for each species 標高の違う3箇所で母材料を収集する								X	X	X	X	X							Mr. KC Chacko, Mr. PKC Pillai & Dr. RC Pandalar (KFR/I)	
	6.2 Develop technology for preserving the germplasm in the form of seed, embryo or plantlet 種子、細胞集合体、または幼植物体の形態による母材料保存技術を開発する	X	X	X	X	X	X	X	X	X	X	X	X								Dr. EM Muralidharan (KFR/I)
	6.3 Prepare strategies for technology development and technical reports on ex-situ conservation 生息域外保全に関する技術開発戦略及び技術レポートを作成する									X											To be nominated (KFR/I)
7 Existing knowledge and techniques for introducing RET tree species in natural forest are applied in the field for their conservation and rehabilitation (by KFD/KFR/I). RET樹種の保全と復旧を目的として自然林に導入するための既存の知識と技術が(KFD/KFR/I)によって現場に適用される	7.1 Implement training to KFD field officers KFD現場職員に研修を行う	X	X																	KFD, Mr. KC Chacko & Mr. Md Kunhi (KFR/I)	
	7.2 Establish trial plot(s) トライアル・プロットを設置する	X	X																		KFD, Mr. KC Chacko, Dr. RC Pandalar, PKC Pillai (KFR/I)
	7.3 Plant RET tree species トライアル用RET樹種を植林する					X	X	X	X	X	X	X	X								KFD, Mr. KC Chacko, Dr. RC Pandalar, PKC Pillai (KFR/I)
	7.4 Record survival and growth of each species 各樹種の生存と成長を記録する					X	X	X	X	X	X	X	X								KFD, Mr. KC Chacko, Dr. RC Pandalar, PKC Pillai (KFR/I)
	7.5 Prepare strategies for technology development and technical reports on trial planting トライアル植林に関する技術開発戦略及び技術レポートを作成する									X											To be nominated (KFD/KFR/I)
8 Public awareness on conservation of RET tree species is created (by KFD/KFR/I). RET樹種に関する人々の意識が(KFD/KFR/I)によって形成される	8.1 Implement trainer's training to KFD field officers KFD現場職員に対してトレーナー研修を行う	X	X	X																	KFD, Mr. KC Chacko & Mr. Md Kunhi (KFR/I)
	8.2 Prepare an awareness programme and materials 意識形成プログラムと材料を作成する				X																KFD, Mr. KC Chacko & Mr. Md Kunhi (KFR/I)
	8.3 Implement the awareness programme 意識形成側面に関する技術レポートを作成する					X	X	X	X	X	X	X	X								KFD, Mr. KC Chacko & Mr. Md Kunhi (KFR/I)
	8.4 Prepare an interim report and a final report on public awareness aspects 意識形成側面に関する技術レポートを作成する									X											KFD, Mr. KC Chacko & Mr. Md Kunhi (KFR/I)
9 Project results are disseminated locally, nationally and internationally (by KFR/I/KFD). プロジェクトの成	9.1 Publish materials prepared through the project activities, newsletters, etc. ガイドライン、技術レポート等のプロジェクトによって作成されたマテリアルやニュースレターを発行する	X	X	X	X	X	X	X	X	X	X	X	X								Dr. Jose Kalirackal

Outputs	Activities	2002	2003	2004	2005	2006	2007	Remarks
		Q1	Q2	Q3	Q4	Q1	Q2	
果が(KFR/KFD)によってケララ州内、インド国内、国際的に広められる	9.2 Organize seminars and/or workshops for dissemination of the project activities and/or results プロジェクトの活動や結果を普及するためのワークショップを開催する	X			X		X	Dr. Jose Kallarackal

Outputs	Activities	Year 1		Year 2		Year 3		Year 4		Year 5		Staff in charge (Please)
		1	2	1	2	1	2	1	2	1	2	
		1	Information on potential of planting stocks of the selected RET tree species is enriched.									
1.1	Prepare a distribution map for each species											Dr. K. Swarupanandan Dr. PV Nair (KFRI)
1)	Extract geographic, altitudinal and vegetation type details from herbaria and existing literature	X										
2)	Overlay the information on a topographic GIS map to make a map of potential area of distribution	X										
1.2	Prepare a map of the populations of each species and its ecological associations											Dr. K. Swarupanandan Dr. PV Nair (KFRI)
1)	Identify discontinuities in topography and vegetation types in the distribution map		X	X	X							
2)	Locate the outer limits of occurrence of each species by field studies		X	X	X							
3)	Identify density of the population through stratified sampling		X	X	X							
4)	Enter the data to modify the existing distribution map			X	X							
1.3	Identify plant communities holding the selected species		X	X	X	X	X					Dr. K. Swarupanandan (KFRI)
1.4	Identify the reproductive abnormality causing failure of fruiting and seed setting for each species											Dr. E.P Indira & Dr. K Swarupanandan (KFRI)
1)	Work out the internal anatomy of the fruits and seeds		X	X	X	X	X					
2)	Evaluate incompatibility mechanisms		X	X	X	X	X					
1.5	Estimate population size for each species											Dr. K. Swarupanandan (KFRI)
1)	Conduct sampling			X	X	X	X					
2)	Compute population size			X	X	X	X					
1.6	Estimate the role of pollinators for each species											Dr. Geprge Mathew & Dr. K. Mohandas(KFRI)
1)	Generate data on insect pollinator	X	X	X	X							
2)	Assess the potential of pollinators	X	X	X	X							
3)	Develop methods to maintain pollinators in the lab					X	X					
4)	Study enhancement of pollinators through field introduction							X	X	X	X	
1.7	Prepare a calendar for the collection of seeds for each species											Mr. KC Chacko (KFRI)
1)	Prepare a proforma for recording phenology of flowering and fruiting	X										
2)	Conduct periodic field visits to score phenology	X	X	X	X	X	X	X	X	...	...
3)	Prepare and refine a calendar for each species							X	...	X		
1.8	Prepare strategies for technology development and technical reports on biological aspects											To be nominated (KFRI)
1)	Prepare an interim report as well as a strategy paper for technology development on biological					X						
2)	Prepare a final report on biological aspects									X		

Outputs	Activities	Year 1		Year 2		Year 3		Year 4		Year 5		Staff in charge (Please)
		1	2	1	2	1	2	1	2	1	2	
2 Ecophysiological characteristics on the selected RET tree species are identified	2.1 Identify niche specificity of each species											Dr. Jose Kallarackal & Dr. CK Somen (KFRI)
	1) Measure location climate	X	X	X	X	X	X	...	...	...	...
	2) Measure microclimate		X	X	X	X	X	...	...	...	...
	3) Measure photosynthesis of seedlings			X	X	X	X					
	4) Measure leaf area index of the canopy trees		X	X	X	X	X					
	5) Measure soil moisture	X	X	X	X	X	X					
	6) Measure plant water potential	X	X	X	X	X	X					
	7) Measure light availability (Photosynthetically Active Radiation-PAR-and Red/Far Red Ratio)		X	X	X	X	X					
	8) Measure performance index of seedlings			X	X	X	X					
	9) Measure water requirements of trees			X	X	X	X					
	10) Raise seedlings in controlled chambers					X	X	X	X	X	X	
	2.2 Identify mycorrhizal requirements and associations for each species											Dr. C. Mohanan (KFRI)
	1) Identify endo- and ectomycorrhizal associations	X	X	X	X							
	2) Study the host mycorrhizal fungal interaction			X	X	X	X					
	3) Isolate and identify ectomycorrhizal symbionts		X	X	X	X	X					
	4) Retrieve spore and identify endomycorrhizal symbionts		X	X	X	X	X					
	5) Analyze endo- and ectomycorrhizal symbionts at molecular level using Polymerase Chain Reaction			X	X	X	X					
	6) Synthesize ectomycorrhiza to confirm mycorrhizal dependency					X	X					
	7) Produce inoculum of selected endo- and ectomycorrhizal candidates					X	X	X	X			
	8) Study efficiency of artificial mycorrhization on planting stock							X	X	X	X	
	2.3 Identify soil and nutrient requirements for each species											Thomas & Dr. S. Kumaraswamy (KFRI)
	1) Describe soil morphology	X	X	X	X	X	X					
	2) Determine soil physical properties	X	X	X	X	X	X					
	3) Determine soil chemical properties	X	X	X	X	X	X					
	4) Determine nutrients in soil	X	X	X	X	X	X					
	5) Determine nutrients in plants	X	X	X	X	X	X					
	6) Conduct nutrient trials in pots					X	X	X	X			
	7) Conduct nutrient trials in fields							X	X	X	X	

Outputs	Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Staff in charge (Please		
			1	2	1	2	1	2	1	2	1	2			
	2.4	Investigate storage and germination physiology of seeds for each species											Mr. KC Chacko & Dr. Jose Kallarackal (KFRI)		
	1)	Collect seeds	X	X	X	X	X	X							
	2)	Identify storage physiology of seeds	X	X	X	X	X	X	X	X					
	3)	Conduct preliminary trials for preserving of seeds	X	X	X	X	X	X							
	4)	Study germination problems (if any)	X	X	X	X	X	X							
	2.5	Prepare strategies for technology development and technical reports on ecophysiological aspects												To be nominated (KFRI)	
	1)	Prepare an interim report as well as a strategy paper for technology development on ecophysiological aspects						X							
	2)	Prepare a final report on ecophysiological aspects										X			
3	Genetic diversity of the selected RET tree species is understood.	3.1	Determine the level of inbreeding										Dr. M. Balasundaran(KFRI)		
		1)	Isolate and clone DNA for development of microsatellite marker	X											
		2)	Isolate cloned microsatellites, containing DNA segments, to sequence them	X											
		3)	Analyze the sequence to develop microsatellite primers		X										
		4)	Optimize PCR conditions				X								
		5)	Isolate DNA from mature trees of different populations					X							
		6)	Amplify DNA to assess the level of inbreeding					X							
		3.2	Determine pollen/seed movement within and between populations for each species											Dr. M. Bhalasundaran & Dr. EP Indra (KFRI)	
		1)	Isolate DNA from the trees and seedlings for DNA fingerprinting					X							
		2)	Detect microsatellite marker in the pollen from insect body					X							
		3)	Assess gene flow within and between populations						X						
		3.3	Assess genetic variability in the population for each species												Dr. EP India & Dr. M. Balasundaran (KFRI)
		1)	Compare variability within and between populations using statistical software					X							
	2)	Identify population/individual trees for appropriate germplasm collection and for enrichment planting						X							
		3.4	Prepare strategies for technology development and technical reports on genetic aspects											To be nominated (KFRI)	
		1)	Prepare an interim report as well as a strategy paper for technology development on genetic						X						
		2)	Prepare a final report on genetic aspects										X		

Outputs	Activities	Year 1		Year 2		Year 3		Year 4		Year 5		Staff in charge (Please)
		1	2	1	2	1	2	1	2	1	2	
		4	Utilization potential of the selected RET tree species is understood									
4.1	Measure wood properties for each species											Dr. KV Bhat, Dr. R. Gnanaharan (KFRI)
1)	Study wood anatomical properties	X	X	X	X	X	X					
2)	Measure wood physical properties	X	X	X	X							
3)	Measure mechanical properties	X	X	X	X							
4.2	Identify phytochemical and medicinal properties for each species											Dr. N Sasidharan (KFRI)
1)	Identify chemical compounds			X	X	X	X					
2)	Analyze structural properties of the compounds			X	X	X	X					
3)	Isolate the medicinally important compounds to test for pharmaceutical values					X	X					
4.3	Generate data on sustainable extraction of resin for the relevant species											Dr. N Sasidharan (KFRI)
1)	Explore different methods of extraction			X	X	X	X					
2)	Standardize the extraction methods					X	X	X	X			
4.4	Experiment on value addition of NWFPs for standardization of processing techniques for the relevant species			X	X	X	X	X	X			Dr. N Sasidharan (KFRI)
4.5	Assess fodder value for each species											Dr. N Sasidharan (KFRI)
1)	Assess palatability of the foliage			X	X	X	X					
2)	Assess nutritional value			X	X	X	X					
4.6	Prepare strategies for technology development and technical reports on utilization aspects											To be nominated (KFRI)
1)	Prepare an interim report as well as a strategy paper for technology development on utilization					X						
2)	Prepare a final report on utilization aspects									X		

Outputs	Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Staff in charge (Please
			1	2	1	2	1	2	1	2	1	2	
5 Technologies on in-situ conservation for the selected RET tree species are developed	5.1	Collect experimental materials for each species	X	X	X	X	X	X	X	X			To be nominated (KFRI)
	5.2	Develop techniques for preserving the viability of seeds for each selected species											Mr. KC Chacko (KFRI)
	1)	Conduct trials for preservation of seeds							X	X	X	X	
	2)	Prepare technical guidelines (a package of practices) for KFD for storage of seeds										X	
	5.3	Develop methods for seed germination and seedling handling for each species											Mr. KC Chacko & PKC Pillai (KFRI)
	1)	Standardize methods to improve germination					X	X	X	X	X		
	2)	Standardize sowing of seeds/pricking out of seedlings					X	X	X	X	X		
	3)	Prepare technical guidelines (a package of practices) for KFD for production of seedlings in the										X	
	5.4	Develop technology for raising suitable nursery to produce maximum good quality seedlings for each species											Mr. KC Chacko, Dr. RC Pandalai, DR. MP Sujatha, Dr. C. Mohanan, Dr. George Mathew
	1)	Standardize container type and size					X	X	X	X	X		
	2)	Standardize potting mixture					X	X	X	X	X		
	3)	Standardize shade and irrigation schedule					X	X	X	X	X		
	4)	Standardize nutrient application					X	X	X	X	X		
	5)	Standardize pest and disease management					X	X	X	X	X		
	6)	Prepare technical guidelines (a package of practices) for KFD for production of seedlings in the					X	X	X	X	X		
	5.5	Develop technology for propagation by tissue culture and rooted cuttings											Dr. EM Muralidharan & Dr. T Surendran (KFRI)
	1)	Develop techniques for tissue culture	X	X	X	X	X	X					
	2)	Develop techniques for hardening of tissue culture plantlets	X	X	X	X	X	X					
	3)	Develop techniques for macropropagation	X	X	X	X	X	X					
	4)	Develop techniques for hardening of macropropagated plantlets	X	X	X	X	X	X					
	5)	Produce micropropagated and macropropagated plantlets							X	X	X	X	
	6)	Conduct field tests on the plantlets							X	X	X	X	
	5.6	Develop technology for assisted natural regeneration for each species											Mr. KC Chacko, Dr. RC Pandalai (KFRI)
	1)	Select experimental plots in natural forests (1 ha X 3 sites for each species)					X	X					
	2)	Layout experimental plots							X				
	3)	Conduct site preparations							X				
	4)	Observe and analyze seed germination, seedling establishment and growth							X	X	X	X	
5)	Prepare technical guidelines (a package of practices) for assisted natural regeneration for KFD										X		

Outputs	Activities	Year 1		Year 2		Year 3		Year 4		Year 5		Staff in charge (Please)	
		1	2	1	2	1	2	1	2	1	2		
	5.7 Develop technology for enrichment planting for each species											Mr. KC Chacko, Dr. RC Pandalai (KFRI)	
	1) Select experimental plots in natural forests (1 ha X 3 sites for each species)					X	X						
	2) Layout experimental plots							X					
	3) Conduct site preparations							X					
	4) Observe and analyze survival and growth							X	X	X	X		
	5) Prepare technical guidelines (a package of practices) for enrichment planting for KFD										X		
	5.8 Prepare GIS maps											Dr. PV Nair (KFRI)	
	1) Digitize base maps	X											
	2) Plot tree locations		X	X									
	3) Construct a model for species site matching from other studies			X	X								
	5.9 Prepare strategies for technology development and technical reports on in-situ conservation											To be nominated (KFRI)	
	1) Prepare an interim report as well as a strategy paper for technology development on tissue culture and GIS aspects					X							
	2) Prepare a final report on ex-situ conservation technology										X		
6	Technologies on ex-situ conservation for the selected RET tree species are developed	6.1 Establish germplasm for each species										Mr. KC Chacko, Mr. PKC Pillai & Dr. RC Pandalai (KFRI)	
		1) Assemble germplasm materials in the existing nurseries					X						
		2) Select and prepare germplasm sites							X				
		3) Plant germplasm							X	X			
		4) Record survival and growth							X	X	X	X	
		6.2 Develop technology for preserving the germplasm in the form of seed or embryo or plantlet											Dr. EM Muralidharan (KFRI)
		1) Develop techniques for long-term storage of embryos and cultures	X	X	X	X	X	X					
		2) Regenerate plantlets from stored tissues			X	X	X	X	X	X			
		3) Test genetic integrity of regenerants			X	X	X	X					
		4) Conduct field trials							X	X	X	X	
		6.3 Prepare strategies for technology development and technical reports on ex-situ conservation											To be nominated (KFRI)
		1) Prepare an interim report as well as a strategy paper on technology for preserving germplasm					X						
		2) Prepare a final report on ex-situ conservation technology										X	

Outputs	Activities		Year 1		Year 2		Year 3		Year 4		Year 5		Staff in charge (Please
			1	2	1	2	1	2	1	2	1	2	
7 Existing knowledge and techniques for introducing RET tree species in natural forest are applied in the field for their conservation and rehabilitation	7.1	Implement training to KFD field officers											KFD, Mr. KC Chacko & Mr. Md Kunhi (KFRI)
	1)	Plan the training programmes	X										
	2)	Preparation of handouts		X									
	3)	Conduct training programme		X									
	7.2	Establish trial plot(s)											KFD, Mr. KC Chacko, Dr. RC Pandalai, PKC Pillai
	1)	Identify and select suitable sites for trial planting	X										
	2)	Prepare sites		X									
	7.3	Plant trial species			X	X	X	X	X	X	X	X	KFD, Mr. KC Chacko, Dr. RC Pandalai, PKC Pillai
	7.4	Record survival and growth			X	X	X	X	X	X	X	X	KFD, Mr. KC Chacko, Dr. RC Pandalai, PKC Pillai
	7.5	Prepare strategies for technology development and technical reports on trial planting											To be nominated (KFRI)
1)	Prepare an interim report as well as a strategy paper on trial planting					X							
2)	Prepare a final report on trial planting										X		
8 Public awareness on conservation of RET tree species is created	8.1	Implement trainer's training to KFD field officers											KFD, Mr. KC Chacko & Mr. Md Kunhi (KFRI)
	1)	Plan the training programmes	X										
	2)	Preparation of technical handouts		X									
	3)	Conduct training programme			X								
	8.2	Prepare an awareness programme and materials			X								KFD, Mr. KC Chacko & Mr. Md Kunhi (KFRI)
	8.3	Implement the awareness programme				X	X	X	X	X	X	X	KFD, Mr. KC Chacko & Mr. Md Kunhi (KFRI)
	8.4	Prepare technical reports on public awareness aspects					X					X	KFD, Mr. KC Chacko & Mr. Md Kunhi (KFRI)
	1)	Prepare an interim report on public awareness aspects											
2)	Prepare a final report on public awareness aspects					X					X		
9 Project results are disseminated locally, nationally and internationally	9.1	Publish materials prepared through the project activities, newsletters, etc.											Dr. Jose Kallarackal (KFRI)
	1)	Publish a half-yearly online and printed newsletters on the Project and RET tree species	X	X	X	X	X	X	X	X	X	X	
	2)	Publish a final report for distribution										X	
	3)	Publish technical guidelines					X					X	
	4)	Publish an information bulletin for each selected RET tree species										X	
	9.2	Organize seminars and/or workshops for dissemination of the project activities and/or results											Dr. Jose Kallarackal (KFRI)
	1)	Organize a (local) project launching workshop	X										
2)	Organize a national workshop on strategy planning for conservation of RET tree species					X							
3)	Organize an international workshop on conservation of RET tree species										X		

Newspaper 'Malayala Manora' on the 7th November, 2002

New Delhi

The six member delegation from Japan will be reaching here today, to explore the possibilities of funding for the project related to forest and watershed management. This group will be in Kerala up to December 2 2002, and will look into the possibility taking up some projects with funding from Japan International Cooperation Agency. The Leader of the Team is Ms. Emiko Mutsuyoshi, Deputy Director of JICA forest and environment dept. He will reached to Trivandram via Bombay, and other members will come via Chennai, namely Masato Yoneda, Yoichi Matsumoto, Yasuyo Hirouchi, Shuichi Miyabe, and Noriko Ishibashi. The group divides up into two groups, touring all over Kerala. With Japan collaboration, a good project has been carried out in Attapaddy.

Article Blow picture

The team came from Japan to looking into the possibility of funding to project related to forest and watershed management, in discussion with Forest Minister. Forest Secretary, Mr. Bharat Bhuson, Principle CCF Mr. Surendran Asari, JICA Deputy Director, Emiko Mutsuyoshi, Masato Yoneda, Yoichi Matsuchi, etc. are seen in the Picture.

別添資料9 収集資料リスト
様式第1号 (記第2関係)

(収集/作成資料)

資料リスト

平成年月日作成

主管課長	図書館 受入日

	プロジェクトID	- - -	調査団番号	- - -		
地域	調査団名 又は 専門家氏名		調査の種類 又は指導科目		担当部課	
国名	配属機関名		現地調査期間 又は派遣期間		担当者氏名	

番号	資料の名称	形態	種類	発行機関	取扱 区分	図書館 記入欄
1	Annual Report 2002-2002	冊子	収集資料	Ministry of Environment and Forests (MOEF), Government of India		
2	Central Circle, Thrissur, A Quick Look	コピー	収集資料	KFD		
3	Economic Review 2001	冊子	収集資料	State Planning Board, Government of Kerala		
4	Kerala State Forestry Research Plan	コピー	収集資料	KFD		
5	National Wildlife Action Plan 82002-2016)	冊子	収集資料	MOEF		
6	Profiles of Current Research Projects, 2000	冊子	収集資料	KFRI		

7	Proposal, A center for Training, Extension and Education in Tropical Forestry and Environment at Kerala Forest Research Institute, 2001	コピー	収集資料	KFRI		
8	Report of the Working Group on Hills Areas Development Programme/Western Ghats Development Programme for the Tenth Five Year Plan (2002-2007)	冊子	収集資料	Planning Commission, Government of India		
9	State Committee on Science, Technology and Environment, Review, 1999-2000	冊子	収集資料	State Committee on Science, Technology and Environment		
10	The Wildlife (Protection) Act 1972	書籍	収集資料	MOEF		
11	Tropical Botanic Garden and Research Institute (TBGRI) Annual Report 2001-2002	冊子コピー	収集資料	TBGRI		
12	Biogeographic Areas of Kerala, 1991			KFD		
13	KFRI RESEARCH REPORTS 1-200, 2001	CD-ROM		KFD		
14	Policy Guidline for Forest Management(Government Order No. G.O. (MS) No. 3/98/F&WLD), 1998	コピー		KFD		
15	Kerala Forestry Project "CONSOLIDATION / REITERATION OF THE GUIDELINES / INSTRUCTIONS FOR Field Staff. Range Officers And Divisional Officers, 2000	コピー		KFD		
16	A Vegetation Based Approach to Biodiversity Gap Analysis in the Agastymalai Region, Western Ghats, India, 1997	コピー		B.R. Ramesh et al.		
17	Annual Report for 2001-2002, 2001	コピー		KFD		
18	ATLAS of ENDEMICS of the Western Ghats (India), 1997	書籍		Pondichery French Institute		
19	WET EVERGREEN FORESTS OF THE Western Ghats OF INDIA, 1988	コピー		J.P. PASCAL (Pondichery French Institute)		

JICA