

Annex 1
A list of plant species recorded in 3 Nature reserves in TSHPP area

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
	I. PSILOTOPHYTA			
	1. PSILOTACEAE			
1	<i>Psilotum nudum</i> (L.) Griseb.	x	x	x
	II. LYCOPODIOPHYTA			
	1. LYCOPODIACEAE			
1	<i>Huperzia carinata</i> (Poir.) Trevis.	x	x	
2	<i>Huperzia subdisticha</i> Mak.	x	x	x
3	<i>Lycopodium casuarinoides</i> Spring	x	x	x
4	<i>Lycopodium cernuum</i> Linn	x	x	x
5	<i>Lycopodium clavatum</i> L.	x	x	x
	2. SELAGINELLACEAE			
6	<i>Selaginella delicatula</i> (Desv.) Alston		x	x
7	<i>Selaginella dolichoclada</i> Alst.			x
8	<i>Selaginella nipponica</i> Franch. & Sav.		x	
9	<i>Selaginella repanda</i> (Desv.) Spring	x	x	x
10	<i>Selaginella uncinata</i> (Desv.) Spring	x		
11	<i>Selaginella wallichii</i> (Wall. Ex Hook. & Grev.) Spring	x		
	III. EQUISETOPHYTA			
	1. EQUISETACEAE			
12	<i>Equisetum diffusum</i> D. Don	x	x	x
13	<i>Equisetum ramosissimum</i> Desf.	x	x	x
	IV. POLYPODIOPHYTA			
	1. ADIANTACEAE			
14	<i>Adiantum cappinus-veneris</i> L.	x	x	
15	<i>Adiantum caudatum</i> L.	x	x	x
16	<i>Adiantum flabellulatum</i> L.		x	
17	<i>Adiantum induratum</i> Chr.			x
18	<i>Adiantum philippense</i> L.			x
19	<i>Antrophyum annamensis</i> Chr. & Tard.		x	
20	<i>Antrophyum coriaceum</i> (D. Don) Wall.			x
21	<i>Cheilanthes tenuifolia</i> (Burm.f.) Sw.	x	x	
22	<i>Coniogramma macrophylla</i> (Blume) Hieron.	x		
23	<i>Pteridium aquilinum</i> (Linn) Kuhl		x	

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24	<i>Vittaria amboinensis</i> Fee.			X
25	<i>Vittaria elongata</i> Sw.			X
26	<i>Vittaria flexuosa</i> Féc		X	
	2. ASPLENIACEAE			
27	<i>Asplenium colaniae</i> Tard.-Blot	X		X
28	<i>Asplenium ensiforme</i> Wall.		X	
29	<i>Asplenium exiguum</i> Bedd.		X	
30	<i>Asplenium griffithianum</i> Hook.	X		
31	<i>Asplenium lacciniatum</i> D. Don		X	
32	<i>Asplenium nidus</i> L.	X		X
33	<i>Asplenium nitidum</i> Sw.		X	
34	<i>Asplenium normale</i> D. Don	X		
35	<i>Blechnum orientale</i> L.			X
36	<i>Bolbitis cadieri</i> (C. Chr.) Ching			X
37	<i>Asplenium semicordata</i> (Bac.) Ching			X
38	<i>Christella molliuscula</i> (Kuhn) Iwats			X
39	<i>Christella parasitica</i> (L.) Lev.			X
40	<i>Diplazium conterminum</i> Chr.			X
41	<i>Diplazium esculentum</i> (Retz.) Sw.			X
42	<i>Polystichum deltodon</i> (Bak.) Ching			X
43	<i>Tectaria polymorpha</i> (Hook.) Copel.			X
44	<i>Tectaria quinquephida</i> (Bak.) Ching			X
45	<i>Neottopteris nidus</i> (Linn) J. Sm.		X	
	3. ATHYRIACEAE		X	
46	<i>Callipteris esculenta</i> (Retz.) J. Sm.		X	
47	<i>Diplazium lanceum</i> (Thumb.) Bedd		X	
	4. BLECHNACEAE			
48	<i>Blechnum orientale</i> L.	X	X	
49	<i>Woodwardia javanica</i> (Blume) Sm.		X	
50	<i>Woodwardia unigemmata</i> (Makino.) Nakai		X	
	5. CYATHEACEAE			
51	<i>Cyathea contaminans</i> (Wall.) Cop	X	X	X
52	<i>Cyathea podophylla</i> Cop		X	
53	<i>Cibotium barometze</i> (L.) J. E. Sm.			X
	6. DAVALLIACEAE			
54	<i>Davallia formosana</i> Blume		X	X

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55	<i>Davallia repens</i> (L.f.) Kuhn			x
56	<i>Nephrolepis cordifolia</i> (Linn) Presl		x	
	7. DENNSTAEDTIACEAE			
57	<i>Microlepia marginata</i> (Houtt.) C. Chr.		x	
58	<i>Pteridium aquilinum</i> (L.) Kuhn	x		
	8. DICKSONIACEAE			
59	<i>Cibotium barometz</i> (L.) J. Smith	x	x	x
	9. DIPTERIDACEAE			
60	<i>Dipteris chinensis</i> (Kaulf.) Reinw.	x	x	
	10. GLEICHENLACEAE			
61	<i>Dicranopteris linearis</i> (Burm.f) Underw.	x	x	x
62	<i>Gleichenia truncata</i> (Willd) Spring	x		
	11. HYMENOPHYLLACEAE			
63	<i>Crepidomanes bipunctatum</i> (Poir.) Copel.		x	x
64	<i>Microgonium beccarianum</i>		x	x
	12. MARATTIACEAE			
65	<i>Angiopteris cochinchinensis</i> Vriese	x	x	
66	<i>Angiopteris crassipes</i> Wall.		x	x
67	<i>Angiopteris polytheca</i> Tard. et Chr.		x	
	13. OSMUNDACEAE			
68	<i>Osmunda vachelii</i> Hook.	x	x	x
	14. POLYPODIACEAE			
69	<i>Aglaomorpha coronans</i> (Wall. ex Mett.) Copel.	x	x	x
70	<i>Drynaria bonii</i> (Kze) J. Sm.	x	x	x
71	<i>Drynaria fortunei</i> (O. Kuntze ex Mett.) J. Smith	x	x	
72	<i>Pseudodrynaria coronans</i> (Wall. et Mett) Ching	x	x	
	15. PTERIDACEAE			
73	<i>Pteris cadieri</i> Christ	x	x	x
74	<i>Pteris ensiformis</i> Burm.f.	x	x	x
75	<i>Pteris grevilleana</i> Wall.		x	
76	<i>Pteris vittata</i> L.	x	x	x
	16. SCHIZEACEAE			
77	<i>Lygodium conforme</i> C.Chér	x	x	x
78	<i>Lygodium digitatum</i> Presl	x	x	x
79	<i>Lygodium polystachyum</i> Wall. ex Moore	x	x	
80	<i>Lygodium scandens</i> Sw.	x	x	

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	17. THELYPTERIDACEAE			
81	<i>Thelypteris sp.</i>	x	x	
	V. PINOPHYTA			
	1. CUPRESSACEAE			
82	<i>Calocedrus macrolepis</i> Kurz		x	
83	<i>Cunninghamia knonishii</i> Hayata		x	
84	<i>Fokienia hodginsii</i> (Dunn) A. Henry et Thomas	x	x	x
	2. CYCADACEAE			
85	<i>Cycas balansae</i> Warb.	x	x	x
86	<i>Cycas pectinata</i> Griff.	x	x	x
	3. GNETACEAE			
87	<i>Gnetum latifolium</i> Bl. var. <i>blumei</i> Mgf	x	x	
88	<i>Gnetum montanum</i> Mgf	x	x	
	4. PINACEAE			
89	<i>Keteleeria evelyniana</i> Mast.		x	x
90	<i>Pinus kwangtungensis</i> Chun ex Tsiang		x	x
91	<i>Pinus massoniana</i> D.Don	x	x	x
92	<i>Pinus merkusii</i> Jungh. & de Vriese	x	x	x
	5. PODOCARPACEAE			
93	<i>Dacrydium elatum</i> (Roxb.) Wall. et Hook.		x	x
94	<i>Dacrycarpus imbricatus</i> (Bl.) De Laub.		x	x
95	<i>Nageia fleuryi</i> (Hiekel) de Laub	x	x	x
96	<i>Podocarpus macrophyllus</i> D.Don var. <i>maki</i> Endl		x	x
97	<i>Podocarpus neriifolius</i> D.Don	x	x	x
98	<i>Podocarpus pilgeri</i> Foxw.		x	x
	6. TAXACEAE			
99	<i>Amentotaxus yunnanensis</i> H.L.Li		x	x
	VI. MAGNOLIOPHYTA			
	A. MAGNOLIOPSIDA			
	1. ACANTHACEAE			
100	<i>Dicliptera chinensis</i> Ness		x	x
101	<i>Justicia gendarussa</i> L.		x	
102	<i>Justicia poilanei</i> Benn.	x	x	
103	<i>Justicia vagabunda</i> R.Ben.	x	x	x
104	<i>Justica ventricosa</i> Wall.		x	x
105	<i>Rungia parviflora</i> Nees		x	

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106	<i>Strobilanthesacrocephalus</i> T. Anders	x	x	
107	<i>Strobilanthesbrunnescens</i> R. Ben	x	x	
108	<i>Strobilanthes cusia</i> (Ness) Kuntze		x	x
109	<i>Strobilanthes multangurus</i> R. Ben		x	x
110	<i>Thumbergia eberhardtii</i> Benoist	x	x	
	2. ACERACEAE			
111	<i>Acer flabellatum</i> Kend		x	
112	<i>Acer tonkinensis</i> H. Lec.		x	
113	<i>Acer wilsonii</i> Rehd.		x	
	3. ACTINIDIACEAE			
114	<i>Actinidia coriacea</i> (Fin et Gapnep) Dunn	x	x	x
115	<i>Saurauia griffithii</i> Dryer var. <i>annamica</i> Gagnep.	x	x	x
116	<i>Saurauia tristylla</i> DC.	x	x	x
	4. ALANGIACEAE			
117	<i>Alangium chinense</i> (Lour.) Rehd.	x	x	x
118	<i>Alangium kurzii</i> Craib	x	x	x
	5. ALTINGIACEAE			
119	<i>Liquidambar formosana</i> Hance	x	x	x
	6. AMARANTHACEAE			
120	<i>Achyrrathes aspera</i> L.	x	x	x
121	<i>Achyrrathes bidentata</i> var. <i>longifolia</i> Makino	x	x	
122	<i>Altemanthera sessilis</i> R. Br.		x	x
123	<i>Amaranthus caudatus</i> L.	x	x	x
124	<i>Amaranthus lividus</i> L.	x	x	x
125	<i>Amaranthus spinosus</i> L.	x	x	x
126	<i>Amaranthus tricolor</i> L.		x	
127	<i>Celosia argentea</i> L.	x	x	x
128	<i>Celosia cristata</i> Miq		x	
129	<i>Cyathula prostrata</i> (L.) Blume	x		x
130	<i>Gomphrena globosa</i> L.		x	
131	<i>Psilotrichum ferrugineum</i> (Roxb.) Miq.		x	x
	7. ANACARDIACEAE			
132	<i>Allospondias lakonensis</i> Pierre	x	x	x
133	<i>Buchanania latifolia</i> Roxb.	x	x	
134	<i>Buchanania lucida</i>	x		
135	<i>Choerospondias axillaris</i> Burtt. et Hill	x	x	x

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136	<i>Dracontomelum duperreanum</i> Pierre	x	x	x
137	<i>Mangifera foetida</i> Lour.	x	x	x
138	<i>Mangifera indica</i> L.	x	x	x
139	<i>Rhus chinensis</i> Muell.	x	x	x
140	<i>Rhus rhesoides</i> Craib.	x	x	x
141	<i>Rhus succedanea</i> L.	x	x	x
142	<i>Semecarpus annamensis</i> Tard.	x		
143	<i>Semecarpus anacardiopsis</i> Evr. et Tard.	x		
144	<i>Semecarpus perniciosus</i> Evr. et Tard.	x		
145	<i>Toxicodendron succedaneum</i> (L.) Moladenke	x	x	x
	8. ANCISTROCLADACEAE			
146	<i>Ancistrocladus cochinchinensis</i> Gagnep.	x	x	
147	<i>Ancistrocladus tectorius</i> (Lour.) Merrill	x	x	x
	9. ANNONACEAE			
148	<i>Alphonsea boniana</i> Fin. et Gagnep.	x	x	x
149	<i>Alphonsea tonkinensis</i> DC.	x	x	x
150	<i>Annona squamosa</i> L.	x	x	x
151	<i>Artabotrys hongkongensis</i>	x	x	
152	<i>Dasymaschalon macrocalyx</i> Fin. & Gagn.	x	x	
153	<i>Dasymaschalon rostratum</i> Merr. & Chun		x	
154	<i>Desmos chinensis</i> Lour.	x	x	x
155	<i>Desmos cochinchinensis</i> Lour.	x	x	x
156	<i>Desmos dumosus</i> Safford		x	
157	<i>Fissistigma bicolor</i> (Roxb.) Merr.	x		
158	<i>Fissistigma capitaum</i> ex Li		x	
159	<i>Fissistigma latifolium</i> (Dun.) Merr.	x		
160	<i>Goniothalamus tamirensis</i> Pierre ex Fin.	x	x	
161	<i>Goniothalamus vietnamensis</i> Ban		x	
162	<i>Goniothalamus yunnanensis</i> Wang		x	
163	<i>Polyalthia cerasoides</i> Genth et Hook	x	x	
164	<i>Polyalthia corticosa</i> (Pierre) Fin. et Gagnep.	x	x	
165	<i>Polyalthia thorelii</i> (Pierre) Din. & Gagnep.		x	x
166	<i>Polyalthia macrocalyx</i>			x
167	<i>Popowia pisocarpa</i> (Blume) Engl.	x		
168	<i>Uvaria boniana</i> Finet et Gagnep.	x	x	
169	<i>Uvaria hirsuta</i> Jack.	x	x	

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170	<i>Uvaria macrophylla</i> Roxb.	x	x	
171	<i>Uvaria micrantha</i> (A. DC.) Hook. f.	x	x	
172	<i>Uvaria microcarpa</i> Champ. ex Benth.	x	x	
173	<i>Xylopia</i> Sp.	x		
174	<i>Xylopia vielana</i> Pierre	x	x	
	10. APOCYNACEAE			
175	<i>Alstonia mairei</i> Le'vl.	x	x	
176	<i>Alstonia scholaris</i> R.Br.	x	x	x
177	<i>Kibatalia macrophylla</i> (Pitard) Woodson	x	x	x
178	<i>Melodinus annamensis</i> Pitard			x
179	<i>Melodinus cochinchinensis</i> (Lour.) Merr.	x		
180	<i>Paravallaris macrophylla</i> Pierre	x	x	x
181	<i>Rauvolfia verticillata</i> Lour. Baill.	x	x	x
182	<i>Strophanthus caudatus</i> (Brum.) Kurz	x	x	x
183	<i>Strophanthus divaricatus</i> (Lour.) Hook. et Arn.	x	x	
184	<i>Tabernaemontana bovina</i> Lour.		x	
185	<i>Tabernaemontana bufalina</i> Lour.	x	x	
186	<i>Tabernaemontana luensis</i> Pierre		x	
187	<i>Wrightia annamensis</i> Eberh.	x	x	x
188	<i>Wrightia laevis</i> Hook.f.	x	x	
189	<i>Wrightia pubescens</i> R.Br.	x	x	x
	11. AQUIFOLIACEAE			
190	<i>Ilex crenata</i> Thumb.		x	x
191	<i>Ilex eugenifolia</i> Pierre		x	x
192	<i>Ilex cinerea</i> Champ		x	x
193	<i>Ilex rotunda</i> Thumb.	x	x	x
	12. ARALIACEAE			
194	<i>Acanthopanax trifoliatum</i> (L.)	x	x	x
195	<i>Aralia armata</i> (Wall. ex. G. Don) Seem. var. <i>armata</i>	x	x	x
196	<i>Brassaiopsis glomerulata</i> (Blume) Regd.	x	x	x
197	<i>Heteropanax fragrans</i> Hem	x	x	
198	<i>Schefflera alpina</i> Grushv. et N. Skvorts.		x	x
199	<i>Schefflera elliptica</i> (Blume) Harms	x	x	x
200	<i>Schefflera heptaphylla</i> (L.) Frodin	x	x	x
201	<i>Schefflera lencantha</i> R. Vig.	x	x	x
202	<i>Schefflera pes-avis</i> R. Vig.	x	x	x

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203	<i>Trevesia palmata</i> (Roxb.) Vig.	x	x	x
	13. ASCLEPIADACEAE			
204	<i>Dischidia acuminata</i> Cost.	x	x	x
205	<i>Hoya multiflora</i> Blume		x	x
206	<i>Streptocaulon griffithii</i> Hook. f.	x	x	x
	14. ASTERACEAE			
207	<i>Adensostemma lavenia</i> (L.) Kunzt	x	x	x
208	<i>Adensostemma macrophyllum</i> (Blume) DC.	x	x	x
209	<i>Ageratum conyzoides</i> L.	x	x	x
210	<i>Artemisia carvillora</i> Wall.	x	x	x
211	<i>Artemisia japonica</i> Thunb.	x	x	x
212	<i>Bidens pillosa</i> L.	x	x	x
213	<i>Blumea balsamifera</i> (Linn.) DC.	x	x	x
214	<i>Chromolaena odorata</i> (L.) King et Robinson	x	x	x
215	<i>Conyza canadensis</i> (L.) Cronq	x	x	
216	<i>Crassocephalum crepidioides</i> (Benth.) Moore	x		
217	<i>Erechtites valerianaefolia</i> (Wolf.) DC.	x	x	
218	<i>Eupatorium adenophorum</i>		x	
219	<i>Eupatorium odoratum</i> L.	x	x	x
220	<i>Gynura crepidoides</i> Benth.	x	x	
221	<i>Mikamia cordata</i> (Brum.) Robinson	x	x	x
222	<i>Pluchea indica</i> (L.) Less	x	x	x
223	<i>Sphaeranthus africanus</i> L.	x	x	
224	<i>Xanthium strumarium</i> L.	x	x	x
	15. BALSAMINACEAE			
225	<i>Impatiens claviger</i> Hook.f.	x	x	x
	16. BEGONIACEAE			
226	<i>Begonia aptera</i> Bl.		x	x
227	<i>Begonia baviensis</i> Gagnep.		x	x
228	<i>Begonia bonii</i> Gagn.		x	x
229	<i>Begonia villifolia</i> var. <i>australis</i> Irmscher	x	x	x
	17. BIGNONIACEAE			
230	<i>Hernandia brilletti</i> Steenis	x	x	x
231	<i>Markhamia cauda-felina</i> (Hance) Craib	x	x	x
232	<i>Markhamia stipulata</i> (Wall.) Seem.	x	x	x
233	<i>Oroxylon indicum</i> Vent	x	x	x

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234	<i>Pauldopia ghorta</i> (G. Don) Steen	x	x	x
235	<i>Radermachera boniana</i> Dop.	x		
236	<i>Stereospermum colais</i> (Dillw.) Mabberl	x		
237	<i>Stereospermum neuranthum</i> Kuzz	x		
	18. BOMBACACEAE			
238	<i>Bombax anceps</i> Pierre	x	x	x
239	<i>Bombax ceiba</i> L.	x	x	x
240	<i>Ceiba pentadra</i> (L.) Gaertn.	x	x	x
	19. BURSERACEAE			
241	<i>Canarium album</i> (Lour.) Raeusch	x	x	x
242	<i>Canarium bengalense</i> Roxb.	x	x	x
243	<i>Garuga pinnata</i> Roxb.		x	
244	<i>Protium serratum</i> (Wall. et Colebr) Engl	x	x	x
	20. CAESALPINIACEAE			
245	<i>Bauhinia acuminata</i> L.	x	x	x
246	<i>Bauhinia alba</i> Hamilt		x	x
247	<i>Bauhinia lecomtei</i> Gagnep.		x	x
248	<i>Bauhinia pyrrhochada</i> Drake		x	
249	<i>Bauhinia variegata</i> L.		x	x
250	<i>Caesalpinia bonduc</i> (L.) Roxb.	x	x	x
251	<i>Caesalpinia latisiliqua</i> (Cavan) Hattink	x	x	
252	<i>Caesalpinia mimosoides</i> Lamk.	x	x	
253	<i>Caesalpinia minax</i> Hance	x	x	x
254	<i>Caesalpinia pubescens</i> (Desf.) Hattink	x	x	x
255	<i>Erythrophleum fordii</i> Oliv.	x		
256	<i>Gleditschia australis</i> Hamsl	x		
257	<i>Gymnocnadas angustifolius</i> (Gagnep.) J.E.Vidal		1	
258	<i>Peltophorum dasyrachis</i> (Miq.) Kurz	x	x	
259	<i>Peltophorum pterocarpum</i> (DC.) Backer ex K. Heyne	x	x	x
260	<i>Saraca dives</i> Pierre	x	x	x
261	<i>Senna alata</i> (L.) Roxb.	x	x	x
262	<i>Senna siamea</i> (Lamk.) Irwin & Barneby	x	x	
263	<i>Senna tora</i> (L.) Roxb.	x	x	x
264	<i>Sindora tonkinensis</i> A.Chev.exK.etS.Larsen	x		
265	<i>Tamarindus indica</i> L.	x	x	x
	21.CAPPARACEAE			

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266	<i>Capparis micracantha</i> DC.	x	x	
267	<i>Capparis tonkinensis</i> Gagn.	x	x	
268	<i>Crataeva magna</i> (Lour.) DC.	x	x	x
269	<i>Stixis scandens</i> Lour.	x	x	x
	22. CAPRIFOLIACEAE			
270	<i>Sambucus javanica</i> Reinw. ex. Blume	x	x	x
271	<i>Viburnum lutescens</i> Blume	x	x	
272	<i>Viburnum punctatum</i> Buch.-Ham ex D.Don	x	x	x
	23. CELASTRACEAE			
273	<i>Celastrus annamensis</i> Tardieu		x	
274	<i>Celastrus tonkinensis</i> Pitard		x	
275	<i>Euonymus laxiflorus</i> Champ.	x	x	
	24. CLUSIACEAE			
276	<i>Callophyllum balansae</i> Pitard.	x	x	
277	<i>Callophyllum poilanei</i> Gagnep.	x	x	x
278	<i>Garcinia cambodgiensis</i> Vesque		x	
279	<i>Garcinia cowa</i> Roxb.	x	x	x
280	<i>Garcinia fragacoides</i> A. Chev.	x	x	x
281	<i>Garcinia multiflora</i> Champ	x	x	x
282	<i>Garcinia obolongifolia</i> Benth. et Champ	x	x	x
	25. COMBRETACEAE			
283	<i>Anogeissus acumilata</i> var. <i>lanceolata</i> Wall ex Clark	x	x	
284	<i>Calycopteris floribunda</i> (Roxb.) Lamk	x	x	
285	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	x	x	
286	<i>Terminalia catappa</i> L.	x	x	x
287	<i>Terminalia myriocarpa</i> Heurck et Muell. Arg	x	x	
	26. CONNARACEAE			
288	<i>Cnestis papala</i> (Lour.) Merr.	x	x	x
289	<i>Connarus paniculata</i> Roxb.	x	x	x
290	<i>Rourea minor</i> spp. <i>microphylla</i> (Hook. & Arn.) J.E. Vidal.	x	x	
	27. CUCURBITACEAE			
291	<i>Gymnopetalum cochichinensis</i> Kurz	x	x	x
292	<i>Hodgsonia macrocarapa</i> Cogn	x	x	x
293	<i>Trichosanthes rubriflos</i> Thorel ex Cayla	x	x	x
294	<i>Trichosanthes tricuspidata</i> Lour.	x	x	x
295	<i>Zehneria indica</i> (Lour.) Keraudren	x	x	x

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
	28. CUSCUTACEAE			
296	<i>Cuscuta chinensis</i> Lamk.	x	x	
297	<i>Cuscuta japonica</i> choisy	x	x	x
	29. DAPHNIPHYLLACEAE			
298	<i>Daphniphyllum chartaceum</i> Rosenst.	x	x	
	30. DILLENLACEAE			
299	<i>Dillenia heterosepala</i> Finet et Gagnep.	x	x	x
300	<i>Dillenia indica</i> L.	x	x	x
301	<i>Dillenia pentagyna</i> Roxb.	x	x	
302	<i>Dillenia scabrella</i> Roxb.		x	
303	<i>Tetracera scandens</i> (L.)	x	x	x
	31. DIPTEROCARPACEAE			
304	<i>Dipterocarpus retusus</i> Blume	x	x	x
305	<i>Hopea chinensis</i> () Hand.-Mazz.	x	x	
306	<i>Hopea mollissima</i> C.Y.Wu	x	x	
307	<i>Parashorea chinensis</i> Wang Hsie	x	x	x
308	<i>Vatica diospyroides</i> Sym.	x	x	x
309	<i>Vatica fleuryana</i>		x	
310	<i>Vatica odorata</i> Symington	x	x	
	32. EBENACEAE			
311	<i>Diospyros apiculata</i> Hiern.	x	x	x
312	<i>Diospyros cauliflora</i> Blume	x	x	x
313	<i>Diospyros decandra</i> Lour.	x	x	x
314	<i>Diospyros filipendula</i>		x	x
315	<i>Diospyros mun</i> A. Chev. ex Lecomte	x		
316	<i>Diospyros petelotii</i>		x	x
	33. ELAEAGNACEAE			
317	<i>Elaeagnus bonii</i> II.Lee	x	x	x
	34. ELAEOCARPACEAE			
318	<i>Elaeocarpus apiculatus</i> Gagnep.	x	x	
319	<i>Elaeocarpus griffithii</i> (Wight) A Gray	x	x	x
320	<i>Elaeocarpus lanceifolius</i> Roxb.	x	x	
321	<i>Elaeocarpus laoticus</i> Gagnep.	x	x	
322	<i>Elaeocarpus nitentifolius</i> & Chun	x	x	
323	<i>Elaeocarpus sylvestris</i> Poir	x	x	
	35. ERICACEAE			

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
324	<i>Rhododendron hainanense</i> Merrill	x	x	x
325	<i>Rhododendron saxicolum</i> Sleumer		x	
326	<i>Rhododendron simsii</i> Planch.		x	x
327	<i>Vaccinium sprengelii</i> (G. Don) Sleum		x	x
328	<i>Vaccinium tonkinense</i> Dop		x	x
	36. EUPHORBIACEAE			
329	<i>Acalypha lanceolata</i> Willd.	x	x	x
330	<i>Acalypha kerrii</i> Craib		x	x
331	<i>Actephila excelsa</i> var. <i>acuminata</i> Airy-Shaw		x	
332	<i>Alchornea annamica</i> Gagnep.	x	x	x
333	<i>Achornea rugosa</i> Muell-Arg	x		
334	<i>Achornea tiliaefolia</i> Muell-Arg	x	x	
335	<i>Aleurites moluccana</i> Willd.	x	x	x
336	<i>Antidesma acidum</i> Retz.	x	x	
337	<i>Antidesma bunius</i> (L.) Spreng.	x	x	
338	<i>Antidesma ghaesembilla</i> Gaertn.	x	x	x
339	<i>Antidesma velutinum</i> Blume	x	x	x
340	<i>Aporosa dioica</i> (Roxb.) Muell.-Arg.	x	x	x
341	<i>Aprosa myrcocalyx</i>	x	x	x
342	<i>Aporosa planchonania</i> Baill. ex Muell-Arg	x	x	x
343	<i>Aporosa serrata</i> Gagn.	x	x	
344	<i>Aporosa sphaerosperma</i>	x	x	
345	<i>Baccaurea ramiflora</i> Lour.	x	x	x
346	<i>Bischofia javanica</i> Bl.	x	x	x
347	<i>Breynia angustifolia</i> Hook.f.	x	x	x
348	<i>Breynia fleuryi</i> Beille		x	
349	<i>Breynia fruticosa</i> Hook.f	x	x	x
350	<i>Breynia grandiflora</i> Beille	x	x	x
351	<i>Breynia septata</i> Beille	x	x	x
352	<i>Bridelia balansae</i> Tutch	x	x	
353	<i>Chaetocarpus castanocarpus</i> Thw.		x	x
354	<i>Claoxylon indicum</i> Hassk	x	x	x
355	<i>Claoxylon longifolium</i> Endl. ex Hassk.		x	x
356	<i>Cleistanthus myrianthus</i> Kurz	x	x	
357	<i>Cleistanthus pierrei</i> (Gagnep.) Croiz.			c
358	<i>Croton arguratus</i> Blume	x	x	x

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359	<i>Croton glandulosus</i> L.	x	x	x
360	<i>Croton roxburghianus</i> Bal.	x	x	
361	<i>Croton tiglium</i> L.		x	x
362	<i>Croton tonkinensis</i>	x	x	x
363	<i>Croton</i> sp.			x
364	<i>Deutzianthus tonkinensis</i> Gagnep.	x	x	
365	<i>Drypetes perreticulata</i> Gagnep.		x	x
366	<i>Endospermum chinensis</i> Benth.	x	x	
367	<i>Excoecaria cochinchinensis</i> Lour.	x	x	
368	<i>Flueggea spirei</i> Beille	x		
369	<i>Fluggea virosa</i> (Roxb. ex Willd.) Bail		x	
370	<i>Glochidion arnottianum</i> Muell.-Arg.		x	x
371	<i>Glochidion eriocarpum</i> Champ.		x	x
372	<i>Glochidion glomerulatum</i> (Miq.) Boerl.			
373	<i>Glochidion hirsutum</i> Muell-Arg			x
374	<i>Glochidion lanceolarium</i> (Roxb.) Voight.	x	x	
375	<i>Glochidion obliquum</i> Decne.		x	x
376	<i>Homonoia riparia</i> Lour.	x	x	
377	<i>Jatropha curcas</i> L.	x	x	x
378	<i>Macaranga andamanica</i> Kurzz.	x	x	x
379	<i>Macaranga auriculata</i> (Merr.) Airg-Shaw	x	x	x
380	<i>Macaranga balansae</i> Gagnep.	x	x	
381	<i>Macaranga denticulata</i> Muell-Arg	x	x	x
382	<i>Macaranga henryi</i> (Pax et Hoffm) Rehder	x	x	x
383	<i>Mallotus apelta</i> Muell-Arg	x	x	x
384	<i>Mallotus barbatus</i> Muell-Arg	x	x	x
385	<i>Mallotus cochinchinensis</i> Lour.	x	x	x
386	<i>Mallotus paniculatus</i> (Lamk.) Muell. - Arg.	x	x	x
387	<i>Mallotus peltatus</i> (Geis.) Muell.-Arg.	x	x	
388	<i>Mallotus philippinensis</i> Muell-Arg		x	x
389	<i>Phyllanthus emblica</i> L.	x	x	x
390	<i>Phyllanthus reticulata</i> Poir	x	x	x
391	<i>Phyllanthus ruber</i> (Lour.) Spreng	x	x	x
392	<i>Sapium baccatum</i> Roxb.	x	x	x
393	<i>Sapium discolor</i> (Champ) Muell-Arg.	x	x	x
394	<i>Sapium sebiferum</i> Roxb.	x	x	x

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395	<i>Suregada multiflora</i> (Juss.) Baill.	x	x	x
396	<i>Vernicia fordii</i> (Hemsl) Airy-Shaw		x	
397	<i>Vernicia montana</i> Lour.		x	
	37. FABACEAE			
398	<i>Crotalaria acicularis</i> Buch.-Ham. ex Benth	x	x	
399	<i>Crotalaria alata</i> Hans		x	
400	<i>Crotalaria chinensis</i> L.		x	x
401	<i>Crotalaria ferruginea</i> Grah. ex Benth.	x	x	
402	<i>Crotalaria mucronata</i> Desv.	x	x	
403	<i>Dalbergia assamica</i> Benth.	x	x	x
404	<i>Dalbergia tonkinensis</i> Pierre	x		
405	<i>Dalbergia rimosa</i> Roxb.	x	x	
406	<i>Derris elliptica</i> Benth.	x	x	x
407	<i>Derris trifolia</i> Lour.	x	x	x
408	<i>Desmodium caudatum</i> (Thunb. ex Murr.) DC.	x	x	
409	<i>Desmodium podocarpum</i> DC.	x	x	
410	<i>Erythrina variegata</i> L.	x	x	x
411	<i>Flemingia grahamiana</i> Wight et Arn.	x	x	x
412	<i>Flemingia macrophylla</i> (Willd.) Prain.	x	x	x
413	<i>Indigofera tinctoria</i> L.		x	x
414	<i>Ormosia balansae</i> Drake	x	x	
415	<i>Ormosia henryi</i> Prain	x	x	
416	<i>Ormosia pinnata</i> (Lour.)	x	x	
417	<i>Ormosia tonkinensis</i> Gagn.	x	x	
418	<i>Pueraria montana</i> (Lour.)	x	x	x
419	<i>Pueraria phaseoloides</i> (Roxb.) Benth.	x	x	
	38. FAGACEAE			
420	<i>Castanopsis annamensis</i> Hance	x		
421	<i>Castanopsis canathiformis</i> (Hickel et Cam) Rehder et Wils	x	x	x
422	<i>Castanopsis cerebrina</i> Barnet		x	x
423	<i>Castanopsis chapaensis</i> Luong		x	x
424	<i>Castanopsis chinensis</i> (Spreng.) Hance	x	x	x
425	<i>Castanopsis crassifolia</i> Hickel et A.Camus	x	x	x
426	<i>Castanopsis indica</i>	x	x	x
427	<i>Castanopsis tonkinensis</i> Seem	x	x	x
428	<i>Lithocarpus ailaonensis</i> A.Camus	x	x	x

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429	<i>Lithocarpus amygdalifolia</i> (Sken) Hayata	x	x	x
430	<i>Lithocarpus annamensis</i> (Hick. et A. Camus) Barn.	x		
431	<i>Lithocarpus areca</i> (Hick. et A. Camus) Drake	x	x	x
432	<i>Lithocarpus cornea</i> (Lour.) Rehder	x	x	x
433	<i>Lithocarpus cryptocarpus</i> A. Camus	x	x	x
434	<i>Lithocarpus dealbatus</i> (Hook.f.) Rehd.	x	x	x
435	<i>Lithocarpus echinophorus</i> (Hickel & A. Camus) A. Camus		x	
436	<i>Lithocarpus laoticus</i> (Hickel et A.Cam) A.Cam	x	x	
437	<i>Quercus chrysocalyx</i> Hickel et A.Camus		x	x
438	<i>Quercus platycalyx</i> Hickel et A.Camus		x	x
	39. FLACOUTIACEAE			
439	<i>Flacourtia rukam</i> Zoll	x	x	
440	<i>Hydnocarpus annamensis</i> H. Lec.	x	x	
441	<i>Hydnocarpus anthemintica</i> Pierre	x	x	x
442	<i>Hydnocarpus hainanensis</i> (Merr.) Sleum	x	x	x
443	<i>Hydnocarpus kurzii</i> (King) Warb.	x	x	x
	40. GESNERIACEAE			
444	<i>Aeschynanthus bracteatus</i> DC.		x	x
445	<i>Aeschynanthus hosseusii</i> Pell.		x	x
446	<i>Chirita anachoreta</i> Hance		x	x
447	<i>Chirita eberhardtii</i> Pell.		x	x
448	<i>Hemiboea subcapitata</i> C.B. Clarke		x	x
449	<i>Paraboea chinensis</i> (Oliv.) Stapf.		x	x
	41. HAMAMELIDACEAE			
450	<i>Exbuclandia populnea</i> (R.Br.) R.Br.		x	
451	<i>Exbuclandia tonkinensis</i> (Lecomte) V.Steen		x	
	42. HERNANDIACEAE			
452	<i>Illigera celebica</i> Miq.	x	x	x
453	<i>Illigera dunniana</i> Levl.	x	x	x
454	<i>Illigera parviflora</i> Dunn.	x	x	x
	43. HIPPOCASTANACEAE			
455	<i>Aesculus assamica</i> Griff.		x	
	44. HYDRANGEACEAE			
456	<i>Dichroa febrifuga</i> Lour.	x	x	
457	<i>Dichroa hirsuta</i> Gagn.	x	x	
	45. HYPERICACEAE			

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
458	<i>Cratoxylum cochinchinensis</i> (Lour.) Blume	x	x	x
459	<i>Cratoxylum formosum</i> (Jack) Benth. & Hook.f. ex Dyer	x	x	
460	<i>Cratoxylon prunifolium</i> Dyer	x	x	
	46. ICACINACEAE			
461	<i>Gomphandra hainanensis</i> Merr.	x		
462	<i>Gonocaryum maclurei</i> Merr.	x	x	
463	<i>Iodes cirrhosa</i> Turcz	x	x	x
	47. ILLICIACEAE			
464	<i>Illicia combodianum</i> Hance		x	x
465	<i>Illicium parviflorum</i> Merr.		x	x
466	<i>Illicium tsaii</i> A.C Smith		x	
	48. IXONATHACEAE			
467	<i>Ixonanthes chinensis</i> Champ		x	
	49. JUGLANDACEAE			
468	<i>Anamocarya sinensis</i> (Dode) Leroy	x	x	x
469	<i>Cayra tonkinensis</i> Lee		x	
470	<i>Engelhardia roxburgiana</i> Wall.	x	x	x
471	<i>Engelhardia spicata</i> Lesch. ex Blume	x	x	x
472	<i>Engelhardia spicata</i> var. <i>integra</i> (Kurz) Manning	x	x	x
473	<i>Pterocarya tonkinensis</i> Dode	x	x	x
	50. LAURACEAE			
474	<i>Actinodaphne ellipticibacca</i> Kosterm.	x	x	
475	<i>Actinodaphne obovata</i> (Nees) Blume	x	x	
476	<i>Actinodaphne pilosa</i> (Lour.) Merr.	x	x	
477	<i>Beilschmiedia balansae</i> Lecomte	x	x	x
478	<i>Beilschmiedia ferruginea</i> Liou	x	x	x
479	<i>Beilschmiedia laevis</i> Allen	x	x	x
480	<i>Beilschmiedia laotica</i> Kosterm. sec. Phamh.	x	x	
481	<i>Beilschmiedia percoriaceae</i> Allen	x	x	x
482	<i>Carydaphnopsis tonkinensis</i> (H.Lec.) Airy-Shaw	x	x	x
483	<i>Cassytha filiformis</i> Linn	x	x	x
484	<i>Cinnamomum balansae</i> Lec.	x	x	
485	<i>Cinnamomum bejolghota</i> (Buch.-Ham.) Sweet	x	x	
486	<i>Cinnamomum burmanii</i> (Nees) Blume	x	x	
487	<i>Cinnamomum cassia</i> Bl.	x		
488	<i>Cinnamomum glaucescens</i> (Nees) Drury	x	x	

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489	<i>Cinnamomum iners</i> Reinw. ex Blume	x	x	x
490	<i>Cinnamomum longipes</i> (Jonhst.) Kosterm.	x	x	x
491	<i>Cinnamomum loureiri</i> H.Lec.	x		
492	<i>Cinnamomum polyadelphum</i> (Lour.) Kosterm.	x	x	
493	<i>Cinnamomum tetragonum</i> A. Chev.	x	x	
494	<i>Cinnamomum tonkiensis</i> (Lecomte) A. Chev.	x	x	
495	<i>Cryptocarya chinensis</i> (Hance) Hemsl.	x	x	x
496	<i>Cryptocarya lenticellata</i> H. Lec.	x	x	x
497	<i>Cryptocarya maclurei</i>	x	x	x
498	<i>Lindera racemosa</i> II. Lec.	x	x	
499	<i>Lindera sinensis</i> (Blume) Hmesl.	x		
500	<i>Lindera tonkinensis</i> Lec.	x	x	
501	<i>Litsea baviensis</i> H. Lec.	x	x	x
502	<i>Litsea cubeba</i> (Lour.) Pers.	x	x	x
503	<i>Litsea ferruginea</i> Liou.	x	x	x
504	<i>Litsea glutinosa</i> (Lour.) C.B. Roxb.	x	x	x
505	<i>Litsea lancilimba</i> Merr.		x	
506	<i>Litsea monocephala</i> (Roxb.) Pers.	x	x	
507	<i>Litsea verticillata</i> Hallee	x	x	x
508	<i>Machilus grandifolia</i> S.K. Lee et F.N. Wei	x	x	
509	<i>Machilus odoratissima</i> Nees		x	x
510	<i>Machilus platycarpa</i> Chun.	x		x
511	<i>Machilus velutina</i> Champ		x	
512	<i>Neolitsea angustifolia</i> A. Chev.	x		
513	<i>Neolitsea elaeocarpa</i> Liou.	x		
514	<i>Phoebe cuneata</i> Blume	x	x	
515	<i>Phoebe lanceolata</i> Nees	x	x	x
516	<i>Phoebe macrocarpa</i> C.Y.Wu	x	x	
517	<i>Phoebe tavoyana</i> (Meisn.) Hook. f.	x	x	x
	51. LECYTHIDACEAE			
518	<i>Barringtonia acutangula</i> (L.) Gaertn.	x	x	
519	<i>Barringtonia racemosa</i> (L.) Blume ex DC.	x	x	
	52. LEEACEAE			
520	<i>Leea acuminata</i> Wall.	x	x	x
521	<i>Leea bracteata</i> C.B.Clarke	x	x	x
	53. LOGANIACEAE			

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
522	<i>Gelsemium elegans</i> Benth.	x	x	x
523	<i>Strychnos axillaris</i> Coleh.	x	x	
524	<i>Strychnos</i> sp. G.Don	x	x	
	54. LORANTHACEAE			
525	<i>Dendrophthoe siamensis</i> (Kurz) Dans.	x	x	x
526	<i>Helixanthera parasitica</i> Lour.	x	x	
527	<i>Macrosolen bibracteolatus</i> (Hance) Dans.	x	x	x
528	<i>Taxillus</i> sp.	x	x	x
	55. LYTHRACEAE			
529	<i>Lagestroemia calyculata</i> Kurz	x	x	
530	<i>Lagestroemia corniculata</i> Gagne.	x	x	
	56. MAGNOLIACEAE			
531	<i>Magnolia coco</i> DC.	x	x	x
532	<i>Magnolia nana</i> Dandy		x	x
533	<i>Magnolia</i> sp.		x	x
534	<i>Manglietia chevalieri</i> Dandy	x	x	x
535	<i>Manglietia conifera</i> Dandy	x	x	x
536	<i>Manglietia dandyi</i> (Gagnep.) Dandy		x	x
537	<i>Manglietia fordiana</i> (Hemsl.) Oliv.	x	x	x
538	<i>Manglietia insignis</i> (Wall.) Blume	x	x	
539	<i>Michelia balansae</i> (A.DC.) Dandy	x	x	x
540	<i>Michelia foveolata</i> Merrill	x	x	x
541	<i>Michelia mediocris</i> Dandy	x	x	x
542	<i>Paramichelia baillonii</i> (Pierre) Hu	x	x	
543	<i>Tsoongiodendron odorum</i> Chun		x	
	57. MALVACEAE			
544	<i>Abelmoschus moschatus</i> Medik.	x	x	x
545	<i>Abutilon indicum</i> G.Don	x	x	x
546	<i>Hibiscus macrophyllus</i> Roxb.	x	x	x
547	<i>Hibiscus vitifolius</i> L.	x	x	x
548	<i>Kydia calycina</i> Roxb.	x	x	x
549	<i>Sida cordifolia</i> L.	x	x	x
550	<i>Sida rhombifolia</i> L.	x	x	x
551	<i>Thespesia lampas</i> (Cav.) Dalz. & Gilbs.	x	x	x
552	<i>Urena lobata</i> L.	x	x	x
	58. MELASTOMACEAE			

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
553	<i>Blastus borneensis</i> Cogn.	x	x	
554	<i>Melastoma candidum</i> D.Don	x	x	x
555	<i>Melastoma malabathicum</i> L.	x	x	x
556	<i>Melastoma normale</i> D.Don	x	x	x
557	<i>Melastoma saigonense</i> (Kuntze) Merr.	x	x	x
558	<i>Melastoma sanguineum</i> Sims	x	x	x
559	<i>Melastoma septemnervium</i> (Lour.)	x	x	x
560	<i>Memecylon acuminatum</i> var. <i>tenuis</i> Guillaum.	x	x	x
561	<i>Memecylon edule</i> Roxb.	x	x	x
562	<i>Memecylon scutellatum</i> (Lour.) Naud.	x	x	x
563	<i>Osbeckia chinensis</i> L.	x	x	x
564	<i>Phyllagathis driessenioides</i> C. Hansen	x	x	x
	59. MELIACEAE			
565	<i>Aglaia dasyclada</i> (Haw & T.C.Chen) C.Y.Wu	x	x	
566	<i>Aglaia globosus</i> Pierre	x	x	x
567	<i>Aglaia silvestris</i> (M. Roem.) Merr.	x	x	
568	<i>Aglaia spectabilis</i> (Miq.) Jain. & Bennet.	x	x	
569	<i>Amoora gigantea</i> Pierre	x	x	x
570	<i>Aphanamixis grandifolia</i> Blum	x	x	x
571	<i>Aphanamixis polystachya</i> (Wall.) R.N.Parker	x	x	
572	<i>Chisocheton cochinchinensis</i> Pierre	x	x	
573	<i>Chisocheton paniculatus</i> Hierne	x	x	
574	<i>Chisocheton thorelli</i> Pierre	x	x	
575	<i>Chukrasia tabularis</i> A. Juss.	x	x	x
576	<i>Cipadessa baccifera</i> (Roxb.) Miq.	x	x	x
577	<i>Dysoxylum binectariferum</i> (Roxb.) ex Bedd.	x	x	
578	<i>Disoxylum tonkinensis</i> A. Chev.	x	x	x
579	<i>Heynea trijuga</i> Roxb.	x	x	
580	<i>Khaya senegalensis</i> A.Juss.	x	x	x
581	<i>Melia azedarach</i> L.	x	x	x
582	<i>Toona ciliata</i> Roem	x	x	
583	<i>Toona sureni</i> (Blume) Moore	x	x	x
	60. MENISPERMACEAE			
584	<i>Cosciniium fenestratum</i> (Gaertn.) Colebr.	x	x	
585	<i>Fibraurea recisa</i> Pierre		x	
586	<i>Fibraurea tinctoria</i> Lour.		x	

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
587	<i>Pericampilus glaucus</i> (Lamk.) Merr.	x	x	
588	<i>Stephania brachyandra</i> Diels	x	x	x
589	<i>Stephania dielsiana</i> C.Y. Wu	x	x	x
590	<i>Stephania hernandiifolia</i> Spreng.	x	x	x
591	<i>Stephania japonica</i> (Thunb.) Miers.	x	x	x
592	<i>Tinospora sinensis</i> (Lour.)		x	x
	61. MIMOSACEAE			
593	<i>Acacia confusa</i> Merr.	x	x	x
594	<i>Acacia pennata</i> Willd.	x	x	x
595	<i>Archidendron balansae</i> (Oliv) I. Niels	x	x	x
596	<i>Archidendron chevalieri</i> (Kost) I. Neils	x	x	x
597	<i>Archidendron clypearia</i> (Jack) I. Niels	x	x	
598	<i>Archidendron lucidum</i> Benth.	x	x	x
599	<i>Entada phaseoloides</i> (L.) Merr.	x	x	
600	<i>Leucaena leucocephala</i> (Lamk) De Wit	x	x	x
601	<i>Mimosa diplotricha</i> C. Wright ex Sauvalle	x	x	x
602	<i>Mimosa pudica</i> L.	x	x	x
	62. MORACEAE			
603	<i>Antiaris toxicaria</i> Leschen	x		
604	<i>Artocarpus heterophyllus</i> Lamk.	x	x	x
605	<i>Artocarpus masticata</i> Gagnep.	x		
606	<i>Artocarpus styracifolius</i> Pierre	x	x	
607	<i>Broussonetia papyrifera</i> (L.) L. Her ex Vent	x	x	x
608	<i>Ficus altissima</i> Bl.	x	x	
609	<i>Ficus auriculata</i> Lour.	x	x	x
610	<i>Ficus benjamina</i> L.	x	x	x
611	<i>Ficus callosa</i> Willd.	x	x	x
612	<i>Ficus fistulosa</i> Reinw. ex Blume	x	x	
613	<i>Ficus fulva</i> Reinw.	x	x	
614	<i>Ficus heterohylla</i> L.	x	x	x
615	<i>Ficus hirta</i> Vahd	x	x	
616	<i>Ficus hispida</i> L.f.	x	x	x
617	<i>Ficus macrophylla</i> Desf	x	x	x
618	<i>Ficus microcarpa</i> L.f.	x	x	x
619	<i>Ficus nervosa</i> Heyne	x		
620	<i>Ficus obscura</i> var. <i>borneensis</i> (Miq.) Corner	x		

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621	<i>Ficus racemosa</i> L.	x	x	x
622	<i>Ficus vasculosa</i> Wall.	x	x	
623	<i>Maclura cochinchinensis</i> Kudo et Masan.	x	x	
624	<i>Morus alba</i> L.		x	x
625	<i>Streblus apspers</i> Lour.	x	x	x
626	<i>Streblus ilicifolia</i> (Kurz.) Corn.	x	x	x
627	<i>Streblus laxiflorus</i> (Hutch.) Corn.	x	x	x
628	<i>Streblus macrophyllus</i> Bl.	x	x	x
629	<i>Strobilus tonkinensis</i> Lour.	x		
630	<i>Tacxotrophis macrophylla</i>			x
631	<i>Trophis scandens</i> (Lour.) Planch	x	x	x
	63. MYRISTICACEAE			
632	<i>Horsfieldia amygdalina</i> Warbg	x	x	x
633	<i>Horsfieldia longiflora</i> De Wilde	x	x	
634	<i>Knema conferta</i>			x
635	<i>Knema globularia</i> (Lamk.) Uarb.	x	x	x
636	<i>Knema pierrei</i> Warb.	x	x	x
637	<i>Knema poilanei</i> Wild.	x	x	
638	<i>Knema tonkinensis</i> (Warb.) De Wilde		x	
	64. MYRSINACEAE			
639	<i>Ardisia aciphylla</i> Pitard.	x	x	x
640	<i>Ardisia arboreseens</i> Wall. ex A. DC.	x	x	
641	<i>Ardisia capillipes</i> Pit.	x	x	x
642	<i>Ardisia colorata</i> Roxb.	x	x	
643	<i>Ardisia depressa</i> C.B. Clarke	x		x
644	<i>Ardisia quinquegona</i> Bl.		x	x
645	<i>Embelia acuminata</i>	x	x	x
646	<i>Embelia henryi</i> E. Walker	x	x	x
647	<i>Embelia laeta</i> (L.) Mez	x	x	x
648	<i>Embelia ribes</i> Burm. f.	x	x	x
649	<i>Embelia vestita</i> Roxb.	x	x	x
650	<i>Maesa acuminatissima</i> Merr.	x	x	x
651	<i>Maesa balansae</i> Mez	x	x	
652	<i>Maesa indica</i> Wall.	x	x	
653	<i>Maesa membranaceus</i> A.DC.	x	x	x
654	<i>Maesa perlarius</i> (Lour.) Merr.		x	x

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655	<i>Myrsine linearis</i> (Lour.) S. Moore	x	x	
	65. MYRTACEAE			
656	<i>Baeckea frutescens</i> L.	x	x	
657	<i>Cleistocalyx opereulatus</i> (Rexb) et Pev	x	x	x
658	<i>Psidium guajava</i> L.	x	x	x
659	<i>Rhodomyrtus tomentosa</i> (Ait.) Hassk.	x	x	x
660	<i>Syzygium attopeuense</i> (Gagn.) Merr. & Perry	x	x	x
661	<i>Syzygium baviense</i> (Gagn.) Merr. & Perry	x	x	x
662	<i>Syzygium boisianum</i> (Gagn.) Merr. & Perry	x	x	
663	<i>Syzygium cuminii</i> (L.) Skeels	x	x	x
664	<i>Syzygium formosum</i> (Wall.) Masam.	x	x	x
665	<i>Syzygium jambos</i> var. <i>syvaticum</i> (Gagnep.) & Perry	x	x	x
666	<i>Syzygium levinei</i> (Merr.) Merr. & Perry	x	x	x
667	<i>Syzygium polyanthum</i> (Wight) Walp	x	x	
668	<i>Syzygium zeylanicum</i> (L.) DC.	x	x	
	66. OLACACEAE			
669	<i>Erythralum scanden</i> Blume	x	x	
	67. OLEACEAE			
670	<i>Jasminum longipetalum</i> King et Gamble	x	x	x
671	<i>Jasminum nervosum</i> Lour.,	x	x	x
672	<i>Jasminum sambac</i> (Linn) Ait	x	x	x
673	<i>Jasminum scandens</i> Vahl	x	x	
674	<i>Jasminum subtriplinerve</i> Blume	x	x	x
675	<i>Ligustrum indicum</i> (Lour.) Merr.	x	x	x
676	<i>Olea brachiata</i> (Lour.) Merr.	x	x	x
677	<i>Olea dioica</i> Roxb.	x	x	
678	<i>Osmanthus matsumuranus</i> Hayata		x	
	68. OPILIACEAE			
679	<i>Urobotrya latisquama</i> (Gagnep.) Hiepko	x	x	
	69. OXALIDACEAE			
680	<i>Averrhoa carambola</i> L.	x	x	x
681	<i>Biophytum sensitivum</i> DC.	x	x	
682	<i>Oxalis corniculata</i> L.	x	x	x
683	<i>Oxalis croniculata</i> L.	x	x	x
684	<i>Oxalis</i> sp.		x	x
	70. PANDACEAE			

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685	<i>Mierodensmis caseariaefolia</i> Palch. ex Hook.	x	x	
	71. PASSIFLORACEAE			
686	<i>Adenia heterophylla</i> (Blume) Kood	x	x	x
687	<i>Passiflora foetida</i> L.	x	x	x
	72. PIPERACEAE			
688	<i>Peperomia pellucida</i> (L.) H. B. K.	x	x	x
689	<i>Piper betle</i> L.	x	x	x
690	<i>Piper bonii</i> DC.	x	x	x
691	<i>Piper lolot</i> L.	x	x	x
	73. PLANTACEAE			
692	<i>Plantanus kerrii</i> Gagnep.		x	x
	74. PLANTAGINACEAE			
693	<i>Plantago major</i> L.	x	x	x
	75. POLYGONACEAE			
694	<i>Fallopia multiflora</i> (Thumb) Haraldson (E)	x	x	x
695	<i>Polygonum barbatum</i> L.	x	x	x
696	<i>Polygonum chinensis</i> L.	x	x	x
697	<i>Polygonum dichotomum</i> Blume	x	x	x
698	<i>Polygonum leptostachyum</i> De Bruyn	x	x	x
699	<i>Polygonum odoratum</i> Lour.	x	x	x
700	<i>Polygonum perfoliatum</i> L.	x	x	x
	76. PORTULACEAE			
701	<i>Portulaca oleracea</i> L.	x	x	x
	77. PROTEACEAE			
702	<i>Helicia caulifolia</i> Merr.	x	x	x
703	<i>Helicia formosa</i> Hemsl	x	x	
704	<i>Helicia grandifolia</i> Lecomte	x	x	
705	<i>Helicia hainanensis</i> Hayata		x	x
	78. RANUNCULACEAE			
706	<i>Clematis armandii</i> Franch	x	x	x
707	<i>Clematis buchaniana</i> DC.	x	x	
708	<i>Clematis granulata</i> (Fin. & Gagnep.) Ohwi.	x	x	
709	<i>Clematis smilacifolia</i> Wall.	x	x	x
	79. RHAMNACEAE			
710	<i>Berchemia lineata</i> DC.	x	x	x

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
711	<i>Gouania leptostachya</i> DC.	x	x	x
712	<i>Sageretia theezans</i> Brongn	x	x	x
713	<i>Ziziphus funiculosa</i> Ham. ex Lans	x	x	x
714	<i>Ziziphus mauritiana</i> Lamk.	x	x	x
715	<i>Zizyphus oenoplia</i> (L.) Mill	x	x	x
	80. RHIZOPHORACEAE			
716	<i>Carallia diplopetala</i> Hand.-Mezz.	x	x	x
717	<i>Carallia lancaefolia</i> Roxb.	x	x	
	81. ROSACEAE			
718	<i>Duchesnea indica</i> (Andr) Focke	x	x	x
719	<i>Prunus arborea</i> (Blume) Kalkm	x	x	x
720	<i>Rubus alcaefolius</i> Poir	x	x	x
721	<i>Rubus althacoides</i> Hance	x	x	x
722	<i>Rubus cochinchinensis</i> Tratt	x	x	x
723	<i>Rubus leucanthus</i> Hance	x	x	x
724	<i>Rubus moluccanus</i> L.	x	x	x
	82. RUBIACEAE			
725	<i>Adina cordifolia</i> Hook		x	
726	<i>Aidia oxyodonta</i> Drake	x	x	
727	<i>Aidia pycnantha</i> (Drake) Tirveng.	x	x	
728	<i>Canthium horridum</i> Blume	x	x	
729	<i>Canthium parvifolium</i> Roxb.	x	x	
730	<i>Hedyotis acutangula</i> Champ. ex Benth.	x	x	x
731	<i>Hedyotis auricularia</i> L.	x	x	x
732	<i>Hedyotis biflora</i> (L.) Lamk.	x	x	x
733	<i>Hedyotis multiglomerulata</i> (Pit.) P.H.Ho	x	x	x
734	<i>Ixora coccinea</i> Linn	x	x	
735	<i>Ixora finlaysonian</i> Wall.ex G. Don.	x		
736	<i>Lasianthus annamicus</i> Pitard	x	x	x
737	<i>Lasianthus baviensis</i> (Drake) Pitard	x	x	x
738	<i>Lasianthus tonkinensis</i> (Drake) Pitard.	x	x	x
739	<i>Morinda citrifolia</i> L.	x	x	x
740	<i>Morinda officinalis</i> How		x	x
741	<i>Morinda umbellata</i> L.	x	x	x
742	<i>Mussaenda cambodiana</i> Pierre	x	x	x
743	<i>Neonauclea purpurea</i> (Roxb.)	x	x	

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
744	<i>Paederia scandens</i> (Lour.) Merr.	x	x	x
745	<i>Psychotria montana</i> Blume	x	x	x
746	<i>Psychotria oligoneura</i> Pierre ex Pit.	x	x	
747	<i>Psychotria poilanei</i> Pitard	x	x	
748	<i>Psychotria pseudo-ixora</i> Pitard	x	x	x
749	<i>Psychotria reevesii</i> Wall.	x	x	x
750	<i>Psychotria rubra</i> (Lour.) Poir.	x	x	x
751	<i>Psychotria silvestris</i> Pitard sec. Phamh.	x	x	x
752	<i>Randia canthioides</i> Champ. ex Benth.	x	x	x
753	<i>Randia spinosa</i> (Thb) Poir	x	x	x
754	<i>Uncaria macrophylla</i> Wall.	x	x	x
755	<i>Wendlandia glabrata</i> DC.	x	x	x
756	<i>Wendlandia laotica</i> Pit	x	x	x
757	<i>Wendlandia paniculata</i> DC.	x	x	x
	83. RUTACEAE			
758	<i>Acronychia pedunculata</i> (L.) Miq	x	x	x
759	<i>Citrus aurantifolia</i> (Christm. & Panzer) Swingle	x	x	x
760	<i>Citrus grandis</i> (L.) Osb.	x	x	x
761	<i>Citrus sinensis</i> Osbeck	x	x	x
762	<i>Citrus reticulata</i> Blanco	x	x	x
763	<i>Clausena dunniana</i> Levl.	x	x	x
764	<i>Clausena lansium</i> Skeels	x	x	
765	<i>Euodia leptota</i> (Speng.)	x	x	x
766	<i>Euodia meliaeflia</i> Benth.	x	x	
767	<i>Glycosmis gracilis</i> Tanaka ex Guillaumin	x	x	
768	<i>Glycosmis pentaphylla</i> Corr.	x	x	
769	<i>Micromelum falcatum</i> Tanaka	x	x	
770	<i>Micromelum minutum</i> (Forst. f.) Wight.	x	x	
771	<i>Paramignya monophylla</i> Wight.	x	x	x
772	<i>Zanthoxylum avicenniae</i> (Lamk.) DC.	x	x	x
773	<i>Zanthoxylum rhetsa</i> DC.	x	x	x
	84. SAPINDACEAE			
774	<i>Amesiodendron chinensis</i> (Merr.) Hu	x	x	x
775	<i>Cardiospermum halicacabum</i> L.	x	x	x
776	<i>Dinocarpus fumatus</i> (Blume) Leenh. spp. <i>indochinensis</i> Leenh.	x	x	x

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
777	<i>Dinocarpus longana</i> (Lour.) Steud	x	x	x
778	<i>Lepisanthes rubiginosa</i> (Roxb.) Leenh	x		
779	<i>Litchi chinensis</i> Radlk	x	x	x
780	<i>Mischocarpus pentapetalus</i> (Roxb.) Radkl	x	x	
781	<i>Mischocarpus sundaicus</i> Blume	x	x	
782	<i>Nephelium cuspidatum</i> Blume	x	x	x
783	<i>Nephelium melliferum</i> Gagnep.	x	x	x
784	<i>Pavieasia annamensis</i> Pierre	x	x	x
785	<i>Pometia pinnata</i> spp. <i>tomentosa</i> (Blume) Jacobs	x	x	x
	85. SAPOTACEAE			
786	<i>Eberhardtia tonkinensis</i> H. Lec.		x	
787	<i>Madhuca hainanensis</i> Chun. et How			x
788	<i>Madhuca pasquieri</i> H.J. Lamb	x	x	x
	86. SARGENTODOXACEAE			
789	<i>Sargentodoxa cuneata</i> (Oliv.) Rehd. et Wils.	x	x	
	87. SAURURACEAE			
790	<i>Saururus chinensis</i> Bail	x	xx	x
	88. SCROPHULARIACEAE			
791	<i>Adenosma caeruleum</i> R.Br.	x	x	x
792	<i>Adenosma indiana</i> (Lour.)	x	x	x
	89. SIMARUBACEAE			
793	<i>Ailanthus altissima</i> Swingl	x	x	x
794	<i>Ailanthus triphysa</i> (Dennst) Alston		x	x
795	<i>Brucea javanica</i> (L.) Merr.	x		
796	<i>Eurycoma longifolia</i> Jack	x		
	90. SOLANACEAE			
797	<i>Solalum nigrum</i> Swart	x	x	x
798	<i>Solanum procumbens</i> Lour.	x	x	x
	91. SONNERATIACEAE			
799	<i>Duabaga sonneratioides</i> Ham	x	x	x
	92. STERCULIACEAE			
800	<i>Abroma augusta</i> (L.) Willd.	x	x	x
801	<i>Commersonia platyphylla</i> Anch	x	x	x
802	<i>Helicteres angustifolia</i> L.	x	x	x
803	<i>Helicteres hirsuta</i> Lour.	x	x	x
804	<i>Pterospermum angustifolium</i> Jard.	x		x

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
805	<i>Pterospermum grandifolium</i> Craib.	x		x
806	<i>Pterospermum heterophyllum</i> Hance	x	x	x
807	<i>Pterospermum lancaefolium</i> Roxb.	x	x	x
808	<i>Sterculia lanceolata</i> Cav	x	x	
809	<i>Sterculia nobilis</i> Smith	x	x	
810	<i>Waltheria americana</i> L.			x
	93. STYRACACEAE			
811	<i>Styrax tonkinensis</i> (Pierre) Craib ex Hardw	x	x	x
	94. SYMPLOCACEAE			
812	<i>Symplocos adenophylla</i> Wall. ex G. Don	x	x	
813	<i>Symplocos cochinchinensis</i> (Lour.) Moore	x	x	
	95. THEACEAE			
814	<i>Adinandra integerrima</i> T. And	x	x	
815	<i>Adinandra millettii</i> (Hook. et Arn.) Benth. et Hook. f.		x	
816	<i>Camellia caudata</i> Wall.		x	x
817	<i>Camellia sinensis</i> (L.) Kuntze	x	x	x
818	<i>Camellia sasamqua</i> Nakai		x	
819	<i>Eurya acuminata</i> DC.	x	x	x
820	<i>Eurya laotica</i> Gagnep.	x	x	
821	<i>Eurya nitida</i> Korth.	x	x	
822	<i>Eurya tonkinensis</i> Gagnep.		x	
823	<i>Schima wallichii</i> (DC.) Choisy x	x	x	
	96. THYMELEACEAE			
824	<i>Aquilaria crassna</i> Pierre ex Lecomte	x		
825	<i>Wikstroemia indica</i> (L.) C. A. Mey	x	x	x
	97. TILIACEAE			
826	<i>Colona auriculata</i> Desf.	x	x	x
827	<i>Corchorus aestuans</i> L.	x	x	
828	<i>Burretiodendron tonkinensis</i> Gagnep.) Chang & Miao	x	x	x
829	<i>Grewia annamica</i> Gagnep.	x	x	x
830	<i>Grewia asiatica</i> L.	x	x	x
831	<i>Grewia glabra</i> Blume	x		
832	<i>Grewia hirsuta</i> Wahl	x	x	
	98. ULMACEAE			
833	<i>Celtis japonica</i> Planch.	x	x	x
834	<i>Celtis philippinensis</i> Blanco	x	x	

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
835	<i>Gironniera cuspidata</i> (Blume) Pl. ex Kurz.	x	x	x
836	<i>Gironniera subaequalis</i>	x	x	x
837	<i>Trema angustifolia</i> (Pl.) Blume	x	x	x
838	<i>Trema orientalis</i> (L.) Bl.	x	x	x
839	<i>Ulmus lancifolia</i> Roxb.	x	x	
	99. URTICACEAE			
840	<i>Boehmeria clidemioides</i> Miq.		x	x
841	<i>Boehmeria macrophylla</i> Horn.	x	x	
842	<i>Boehmeria tonkinensis</i> Gagn.		x	
843	<i>Dendrocnide sinuata</i> (Blume) Chew	x	x	x
844	<i>Dendrocnide stimulans</i> (L.f.) Chew		x	x
845	<i>Elatostema balansae</i> Gagnep.	x	x	x
846	<i>Elatostema cuneatum</i> Wight.	x	x	x
847	<i>Laportea violacea</i> Gagnep.		x	x
848	<i>Pellionia repens</i> Lour.			x
849	<i>Pouzolzia sanguinea</i> (Blume) Merr.	x		
850	<i>Pouzolzia zeylanica</i> (L.) Benn.	x		
	100. VERBENACEAE			
851	<i>Callicarpa arborea</i> Roxb.	x		
852	<i>Callicarpa brevipes</i> (Benth.) Hance	x	x	
853	<i>Callicarpa erioclona</i> Schauer in DC.	x	x	
854	<i>Callicarpa longifolia</i> Lamk.	x	x	x
855	<i>Callicarpa macrophylla</i> Vahl	x	x	
856	<i>Clerodendrum chinensis</i> (Obeck) Mabb.	x	x	x
857	<i>Clerodendrum chinensis</i> var. <i>simplex</i> (Mold.) S.L. Chen	x	x	
858	<i>Clerodendrum colebrookianum</i> Walp.	x	x	
859	<i>Clerodendrum cyrtophyllum</i> Turz.	x		
860	<i>Clerodendrum paniculatum</i>	x	x	x
861	<i>Lantana camara</i> L.	x	x	x
862	<i>Vitex helogiton</i> K.Schum.		2	
863	<i>Vitex negundo</i> L.	x	x	
864	<i>Vitex quinata</i> F.N. Will	x	x	
	101. VITACEAE			
865	<i>Cayratia hayatae</i> Gagn.	x	x	x
866	<i>Cissus quadrangularis</i> L.	x	x	
867	<i>Cissus triloba</i> (Lour.)	x	x	

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
868	<i>Tetrastigma beauvaisii</i> Gagn.	x	x	
869	<i>Tetrastigma strumarium</i> Gagnep.		x	
870	<i>Vitis pentagona</i> Diels & Gilg	x	x	x
	B. LILIOPSIDA			
	102. AGAVACEAE			
871	<i>Agave amaniensis</i> Tral.	x	x	x
	103. ARACEAE			
872	<i>Alocasia macrorrhiza</i> (L.) Schott	x	x	x
873	<i>Amorphophallus</i> sp.	x	x	x
874	<i>Anadendrum montanum</i> (Blume) Schott	x	x	x
875	<i>Arisaema balansae</i> Engl.		x	x
876	<i>Epipremnum giganteum</i>	x	x	x
877	<i>Homalonema occulta</i> Schott	x	x	
878	<i>Pothos chinensis</i> (Raf.) Merr.	x	x	x
879	<i>Pothos grandis</i> Buch.	x	x	x
880	<i>Pothos repens</i> (Lour.) Druce	x	x	
881	<i>Pothos scandens</i> L.	x	x	x
882	<i>Raphidophora chevalieri</i> Gagnep.	x	x	x
883	<i>Raphidophora tonkinensis</i> Engl.		x	x
	104. ARECACEAE			
884	<i>Calamus platyacanthus</i> Warb.	x		
885	<i>Calamus redentum</i> Lour.	x	x	
886	<i>Calamus tetradactylus</i>	x	x	x
887	<i>Calamus tonkinensis</i> Becc.	x	x	
888	<i>Caryota mitis</i> Lour.	x	x	x
889	<i>Caryota monostachya</i> Becc.	x	x	x
890	<i>Licuala fatua</i> Becc	x	x	x
	105. CANNACEAE			
891	<i>Canna edulis</i> L.	x	x	x
	106. COSTACEAE			
892	<i>Costus tonkinensis</i> Gagnep.	x	x	x
	107. DRACENACEAE			
893	<i>Dracaena cambodiana</i> Pierre ex Gagnep.	x	x	x
894	<i>Pleomele cochinchinensis</i> il	x	x	x
	108. HYPOCYDACEAE			
895	<i>Curculigo latifolia</i> Dryand.		x	

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
	109. LILIACEAE			
896	<i>Ophiopogon latifolius</i> Rodr	x	x	x
	110. MARANTACEAE			
897	<i>Phynium dispernum</i> Gagnep.	x	x	x
	111. MUSACEAE			
898	<i>Musa uranoscopos</i> Lour.	x	x	x
899	<i>Musa paradisiaca</i> L.	x	x	x
	112. ORCHIDACEAE			
900	<i>Aerides odorata</i> Lour.		x	x
901	<i>Anoectochilus setaceus</i> Blume		x	x
902	<i>Appendicula cornuta</i> Blume		x	
903	<i>Bulbophyllum concinnum</i> Hook. f.		x	
	113. PANDANACEAE			
904	<i>Pandanus tonkinensis</i> Martelli	x	x	x
	114. POACEAE			
905	<i>Arundinaria amabilis</i> Mc. Clure	x	x	x
906	<i>Bambusa blumeana</i> J.A. et J.H.Schult.	x	x	x
907	<i>Bambusa multiplex</i> (Lour.) Rocusch	x	x	x
908	<i>Centosteca latifolia</i> (Osbeck.) Trin	x	x	x
909	<i>Cymbopogon citratus</i> Stapf.	x	x	x
910	<i>Cymbopogon caesius</i> (Nees.) Stapf.		x	
911	<i>Cynodon dactylon</i> Pres	x	x	x
912	<i>Dactyloctenium aegyptium</i> (L.) Richt	x	x	x
913	<i>Dendrocalamus giganteus</i> Munro	x	x	x
914	<i>Dendrocalamus membranaceus</i> Munro	x	x	x
915	<i>Imperata cylindric</i> (Linn.) Beauv	x	x	x
916	<i>Indosasa sinica</i> Chu et Chao	x	x	x
917	<i>Leptochloa panicea</i> (Retz.) Ohwi	x	x	x
918	<i>Neohouzeana dulloa</i> A. Camus	x	x	x
919	<i>Paspalum longifolium</i> Roxb.	x	x	x
920	<i>Pennisetum purpureum</i> K. Scahun	x	x	x
921	<i>Phragmites caommunis</i>	x	x	x
922	<i>Saccharum spontaneum</i> L.	x	x	x
923	<i>Schizostachium leviculme</i> Mc. Clure	x	x	
924	<i>Themeda gigantea</i> (Cav.) Hacak.	x	x	x
925	<i>Thysanolaena maxima</i> (Roxb.) Kantz	x	x	x

No	Scientific name	Pu Hu	Xuan Nha	HK- PC
	115. SMILACACEAE			
926	<i>Smilax glabra</i> Wall. et Roxb.	x	x	x
927	<i>Smilax petelotii</i> T. Koyama	x		
928	<i>Smilax ovalifolia</i> Roxb.	x	x	x
	116. STEMONACEAE			
929	<i>Stemona tuberosa</i> Lour.	x	x	x
	117. TACCACEAE			
930	<i>Tacca chantrieri</i> Andre	x	x	
931	<i>Tacca integrifolia</i> Ker.-Gaul.	x		
	118. ZINGIBERACEAE			
932	<i>Alpinia conchigera</i> Griff.	x	x	
933	<i>Alpinia globosa</i> Horan	x	x	
934	<i>Amomum echinosphaera</i> K.Schum	x	x	x
935	<i>Amomum vespertilio</i> Gagnep.	x	x	x

Annex 2. List of mammal species recorded in 3 Nature Reserves in TSHPP Area

No	Scientific name	English name	Pu Hu	Xuan Nha	HK-PC
1.	I. SCANDENTIA	TREE-SHREWS			
	1. Tupaiidae	Tree Shrews			
2.	<i>Tupaia belangeri</i>	Northern Tree Shrew	+	+	+
	II. PRIMATES	II. PRIMATES			
	2. Lorisidae	Lorises			
3.	<i>Nycticebus bengalensis</i>	Bengal Slow Loris	+		+
4.	<i>Nycticebus pygmaeus</i>	Pygmy Slow Loris	+	+	+
	3. Cercopithecidae	Old World Monkeys			
5.	<i>Macaca arctoides</i>	Stump-tailed Macaque	+	+	+
6.	<i>Macaca assamensis</i>	Assam Macaque	+	+	
7.	<i>Macaca mulatta</i>	Rhesus Monkey	+	+	+
8.	<i>Trachypithecus crepusculus</i>	Grey Langur	+	+	
9.	<i>Trachypithecus francoisi</i>	Delacour's Langur		+	
	4. Hylobatidae	Gibbons			
10.	<i>Nomascus concolor</i>	Western Black-crested Gibbon		+	
11.	<i>Nomascus leucogenys</i>	White-cheeked Gibbon	+		
	III. ERINACEOMORPHA	HEDGEHOGS			
	5. Erinaceidae	Hedgehogs			
12.	<i>Hylomys suillus</i>	Short-tailed Gymnure		+	
	IV. SORICOMORPHA	VII. SHREWS			
	6. Soricidae	Shrews, Shrew mice			
13.	<i>Crocidura attenuata</i>	Asian Gray Shrew		+	
14.	<i>Crocidura fuliginosa</i>	Shoutheast Shrew			+
15.	<i>Suncus murinus</i>	Asian House Shrew	+	+	+
	7. Talpidae	7. Moles			
16.	<i>Euroscaptor longirostris</i>	Long-nosed Mole	+	+	
	V. CHIROPTERA	V. BATS			
	8. Pteropodidae	Fruit Bats			
17.	<i>Cynopterus sphinx</i>	Greater Short-nosed Fruit Bat	+	+	
18.	<i>Rousettus leschenaulti</i>	Leschenault's Rousette	+		
	9. Rhinolophidae	9. Horseshoe Bats			
19.	<i>Rhinolophus pearsonii</i>	Pearson's Horseshoe Bat		+	
	10. Hipposideridae	Old World Roundleaf Bat			
20.	<i>Aselliscus stoliczkanus</i>	Stoliczka's Asian Trident Bat		+	
21.	<i>Hipposideros armiger</i>	Great Leaf-nosed Bat		+	
22.	<i>Hipposideros larvatus</i>	Intermediate Leaf-nosed Bat		+	
23.	<i>Hipposideros pomona</i>	Pomona Leaf-nosed Bat		+	
	11. Vespertilionidae	Evening Bats			
24.	<i>Pipistrellus javanicus</i>	Javan Pipistrelle	+	+	
25.	<i>Pipistrellus tenuis</i>	Least Pipistrelle		+	+
26.	<i>Ia io</i>	Great Evening Bat		+	
	VI. PHOLIDOTA	PANGOLINS			
	12. Manidae	Pagolins			
27.	<i>Manis pentadactyla</i>	Chinese Pagolin	+	+	+

	VII. CARNIVORA	CARNIVORE MAMMALS			
	13. Felidae	Cats			
28.	<i>Catopuma temminckii</i>	Asian Golden Cat	+	+	+
29.	<i>Prionailurus bengalensis</i>	Leopard Cat	+	+	+
30.	<i>Neofelis nebulosa</i>	Clouded Leopard	+		
31.	<i>Panthera pardus</i>	Leopard	+	+	
32.	<i>Panthera tigris</i>	Tiger	+	+	
	14. Viverridae	Civets			
33.	<i>Arctictis binturong</i>	Binturong	+		
34.	<i>Paguma larvata</i>	Masked Palm Civet	+	+	+
35.	<i>Paradoxurus hermaphroditus</i>	Asian Palm Civet	+	+	+
36.	<i>Chrotogale owstoni</i>	Owston's Palm Civet	+	+	+
37.	<i>Prionodon pardicolor</i>	Spotted Linsang	+	+	+
38.	<i>Viverra zibetha</i>	Large Indian Civet	+	+	+
39.	<i>Viverricula indica</i>	Small Indian Civet	+	+	+
	15. Herpestidae	Moongoses			
40.	<i>Herpestes javanicus</i>	Small Asian Mongoose	+	+	+
41.	<i>Herpestes urva</i>	Crab-eating Mongoose		+	
	16. Canidae Gray	Dogs			
42.	<i>Cuon alpinus</i>	Dhole	+	+	+
43.	<i>Nyctereutes procyonoides</i>	Raccoon Dog		+	+
	17. Ursidae	Bears			
44.	<i>Helarctos malayanus</i>	Sun Bear	+	+	
45.	<i>Ursus thibetanus</i>	Asian Black Bear	+	+	+
	18. Mustelidae	18. Otters and Weasels			
46.	<i>Lutra lutra</i>	European Otter	+	+	
47.	<i>Arctonyx collaris</i>	Hog Badger	+	+	+
48.	<i>Martes flavigula</i>	Yellow-throated Marten	+	+	+
49.	<i>Melogale moschata</i>	Chinese Ferret-badger	+	+	+
50.	<i>Mustela kathiah</i>	Yellow-bellied Weasel		+	+
	VIII. ARTIODACTYLA	EVEN-TOED UNGULATES			
	19. Suidae	Pigs			
51.	<i>Sus scrofa</i>	Wild Pig	+	+	+
	20. Tragulidae	Chevrotains			
52.	<i>Tragulus kanchil</i>	Lesser Mouse-deer	+		
	21. Cervidae	Deers			
53.	<i>Muntiacus muntjak</i>	Red Muntjak	+	+	+
54.	<i>Rusa unicolor</i>	Sambar	+	+	
	22. Bovidae	Cattles and Serow			
55.	<i>Bos frontalis</i>	Gaur	+	+	
56.	<i>Capricornis sumatraensis</i>	Sumatran Serow	+	+	+
	IX. RODENTIA	RODENTS			
	23. Sciuridae	Squirrels			
57.	<i>Ratufa bicolor</i>	Black Giant Squirrel	+	+	+
58.	<i>Belomys pearsonii</i>	Hairy-footed Flying Squirrel	+		+
59.	<i>Petaurista elegans</i>	Spotted Giant Flying Squirrel		+	
60.	<i>Petaurista philippensis</i>	Indian Giant Flying Squirrel	+	+	+

61.	<i>Callosciurus erythraeus</i>	Pallas's Squirrel	+	+	+
62.	<i>Callosciurus inornatus</i>	Inornate Squirrel	+	+	+
63.	<i>Dremomys pernyi</i>	Perny's long-nosed Squirrel	+	+	+
64.	<i>Dremomys rufigenis</i>	Asian Red-cheeked Squirrel	+	+	+
65.	<i>Tamiops macclellandii</i>	Himalayan Striped Squirrel	+	+	
66.	<i>Tamiops maritimus</i>	Maritime Striped Squirrel	+	+	+
	24. Spalacidae	24. Bamboo Rats			
67.	<i>Rhizomys pruinosus</i>	Hoary Bamboo Rat	+	+	+
68.	<i>Rhizomys sumatrensis</i>	Indomalayan Bamboo Rat	+	+	
	25. Muridae	Rats and Mice			
69.	<i>Bandicota indica</i>	Greater Bandicoot Rat		+	
70.	<i>Bandicota savilei</i>	Savile's Bandicoot Rat			+
71.	<i>Chiromyscus chiropus</i>	Indochinese Chiromyscus	+		
72.	<i>Leopoldamys edwardsi</i>	Edwards's Leopoldamys	+	+	
73.	<i>Leopoldamys sabanus</i>	Long-tailed Giant Rat		+	
74.	<i>Mus musculus</i>	House Mouse	+	+	+
75.	<i>Niviventer fulvescens</i>	Indomalayan Niviventer	+	+	
76.	<i>Rattus andamanensis</i>	Indochinese Forest Rat		+	+
77.	<i>Rattus rattus</i>	Roof Rat	+	+	+
78.	<i>Rattus tanezumi</i>	Oriental House Rat	+	+	+
	26. Hystricidae	Porcupines			
79.	<i>Atherurus macrourus</i>	Asiatic Brush-tailed Porcupine	+	+	+
80.	<i>Hystrix brachyura</i>	Porcupine	+	+	+

Annex 3. List of birds recorded in 3 Nature Reserves in TSHPP catchment

No	Scientific name	English name	Pu Hu	Xuan Nha	HK-PC
	I. GALLIFORMES	GALLIFORMS			
	1. Phasianidae	Pheasants, Grouse			
1.	<i>Francolinus pintadeanus</i>	Chinese Francolin		+	+
2.	<i>Coturnix japonica</i>	Japanese Quail		+	+
3.	<i>Coturnix chinensis</i>	Blue-breasted Quail	+	+	
4.	<i>Arborophila brunneopectus</i>	Bar-backed Partridge	+		+
5.	<i>Arborophila charltonii</i>	Scaly-breasted Partridge			+
6.	<i>Gallus gallus</i>	Red Junglefowl	+	+	+
7.	<i>Lophura nycthemera</i>	Silver Pheasant	+	+	+
8.	<i>Polyplectron bicalcaratum</i>	Burmese Peacock Pheasant	+		
	II. ANSERIFORMES	ANSERIFORMS			
	2. Turnicidae	Button Quails			
9.	<i>Turnix tanki</i>	Yellow-legged Buttonquail		+	
10.	<i>Turnix suscitator</i>	Barred Buttonquail		+	+
	III. PICIFORMES				
	3. Picidae				
11.	<i>Sasia ochracea</i>	White-browed Piculed	+		+
12.	<i>Dendrocopos hyperythrus</i>	Rufous-bellied Woodpecker			+
13.	<i>Dendrocopos canicapillus</i>	Grey-capped Pygmy Woodpecker	+		
14.	<i>Celeus brachyurus</i>	Rufous Wookpecker	+	+	
15.	<i>Picus rabieri</i>	Red-collared Woodpecker		+	
16.	<i>Picus chlorolophus</i>	Lesser Yellownaped	+		
17.	<i>Picus flavinucha</i>	Greater Yellownaped	+		+
18.	<i>Chrysocolaptes lucidus</i>	Greater Flameback	+	+	
19.	<i>Gecinulus grantia</i>	Pale-headed Woodpecker			+
	4. Megalaimidae				
20.	<i>Megalaima virens</i>	Fire-tufted Barbet			+
21.	<i>Megalaima lagrandieri</i>	Red-vented Barbet	+	+	+
22.	<i>Megalaima faiostricta</i>	Green-eared Barbet	+	+	+
23.	<i>Megalaima asiatica</i>	Blue-throated Barbet			+
24.	<i>Megalaima franklinii</i>	Golden-throated Barbet	+	+	
25.	IV. UPUPIFORMES				
	5. Upupidae				
26.	<i>Upupa epops</i>	Common Hoopoe		+	+
27.	V. TROGONIFORMES				
	6. Trogonidae				
28.	<i>Harpactes erythrocephalus</i>	Red-headed Tragon	+	+	+
29.	VI. CORACIIFORMES				
	7. Coraciidae				
30.	<i>Coracias benghalensis</i>	Indian Roller	+		
31.	<i>Eurystomus orientalis</i>	Dollarbird	+		+
	8. Alcedinidae				
32.	<i>Alcedo atthis</i>	Common Kingfisher	+	+	+

No	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
33.	<i>Ceyx erithacus</i>	Oriental Dwarf Kingfisher	+		
	9. Halcyonidae				
34.	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	+	+	+
35.	<i>Halcyon pileata</i>	Black-capped Kingfisher	+		
	10. Meropidae				
36.	<i>Nyctornis athertoni</i>	Blue-bearded Bee-eater		+	+
37.	<i>Merops viridis</i>	Blue-throated Bee-eater	+	+	
38.	<i>Merops superciliosus</i>	Blue-tailed Bee-eater	+		
	VII. CUCULIFORMES				
	11. Cuculidae				
39.	<i>Clamator coromandus</i>	Chestnut-winged Cuckoo	+		+
40.	<i>Hierococyx sparverioides</i>	Large Hawk Cuckoo		+	+
41.	<i>Cuculus micropterus</i>	Indian Cuckoo	+	+	+
42.	<i>Cacomantis merulinus</i>	Plaintive Cuckoo			+
43.	<i>Cuculus canorus</i>	Eurasian Cuckoo	+		
44.	<i>Eudynamys scolopacea</i>	Asian Koel	+	+	+
45.	<i>Phaenicophaeus tristis</i>	Green-billed Malcoha	+	+	+
	12. Centropodidae				
46.	<i>Centropus sinensis</i>	Greater Coucal	+	+	+
47.	<i>Centropus bengalensis</i>	Lesser Coucal	+	+	+
	VIII. PSITTACIFORMES				
	13. Psittacidae				
48.	<i>Psittacula himalayana</i>	Slaty-headed Parakeet	+	+	
49.	<i>Psittacula alexandri</i>	Red-breasted Parakeet	+	+	+
	IX. APODIFORMES				
	14. Apodidae				
50.	<i>Cypsiurus batusiensis</i>	Asian Palm Swift	+	+	
51.	<i>Apus affinis</i>	House Swift		+	+
52.	<i>Apus pacificus</i>	Fork-tailed Swift	+		
	X. STRIGIFORMES				
	15. Tytonidae				
53.	<i>Tyto capensis</i>	Grass Owl			+
	16. Strigidae				
54.	<i>Otus sunia</i>	Oriental Scops Owl			+
55.	<i>Otus spilocephalus</i>	Mountain Scops Owl	+	+	
56.	<i>Otus bakkamoena</i>	Collared Scops Owl	+	+	+
57.	<i>Ketupa zeylonensis</i>	Brown Fish Owl			+
58.	<i>Glaucidium brodiei</i>	Collared Owlet	+		+
59.	<i>Glaucidium cuculoides</i>	Asian Barred Owlet	+		+
60.	<i>Ninox scutulata</i>	Brown Hawk Owl	+		
	17. Caprimulgidae				
61.	<i>Caprimulgus macrurus</i>	Large-tailed Nightjar		+	
62.	<i>Caprimulgus asiaticus</i>	Indian Nightjar		+	
63.	<i>Caprimulgus indicus</i>	Grey Nightjar			+
	XI. COLUMBIFORMES				
	18. Columbidae				

No	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
64.	<i>Streptopelia orientalis</i>	Oriental Turtle Dove		+	
65.	<i>Streptopelia chinensis</i>	Spotted Dove	+	+	+
66.	<i>Streptopelia tranquebarica</i>	Red Collared Dove	+	+	+
67.	<i>Macropygia unchall</i>	Barred Cuckoo Dove	+	+	
68.	<i>Chalcophaps indica</i>	Emerald Dove	+	+	+
69.	<i>Treron apicauda</i>	Pin-tailed Green Pigeon		+	
70.	<i>Treron curvirostra</i>	Thick-billed Green Pigeon	+		+
71.	<i>Ducula badia</i>	Mountain Imperial Pigeon	+	+	
72.	<i>Ducula aenea</i>	Green Imperial Pigeon			+
	XII. GRUIFORMES				
	19. Rallidae				
73.	<i>Gallirallus striatus</i>	Slaty-breasted Rail		+	
74.	<i>Amaurornis phoenicurus</i>	White-breasted Waterhen		+	+
	XIII. CICONIIFORMES				
	20. Scolopacidae				
75.	<i>Gallinago nemoricola</i>	Wood Snipe		+	
76.	<i>Gallinago gallinago</i>	Common Snipe	+	+	
77.	<i>Actitis hypoleucos</i>	Common Sandpiper	+		
78.	<i>Tringa ochropus</i>	Green Sandpiper		+	
	21. Charadriidae				
79.	<i>Charadrius dubius</i>	Little Ringed Plover		+	
80.	<i>Charadrius alexandrinus</i>	Kentish Plover	+	+	
	22. Glareolidae				
81.	<i>Glareola maldivarus</i>	Oriental Pratincole		+	
	23. Accipitridae				
82.	<i>Aviceda leuphotes</i>	Black Baza			+
83.	<i>Elanus caeruleus</i>	Black-shouldered Kite		+	
84.	<i>Milvus migrans</i>	Black Kite		+	+
85.	<i>Spilornis cheela</i>	Crested Serpent Eagle	+	+	+
86.	<i>Spizaetus nipalensis</i>	Mountain Hawk Eagle		+	
87.	<i>Circus melanoleucos</i>	Pied Harrier			+
88.	<i>Accipiter trivirgatus</i>	Crested Goshawk	+		+
89.	<i>Accipiter nisus</i>	Eurasian Sparrowhawk			+
90.	<i>Buteo buteo</i>	Common Buzzard			+
	24. Falconidae				
91.	<i>Microhierax melanoleucos</i>	Pied Falconet	+		
92.	<i>Microhierax caerulescens</i>	Collared Falconet		+	
93.	<i>Falco severus</i>	Oriental Hobby		+	
94.	<i>Falco tinnunculus</i>	Common Kestrel			+
95.	<i>Falco peregrinus</i>	Peregrine Falcon			+
	25. Ardeidae				
96.	<i>Egretta garzetta</i>	Little Egret	+	+	
97.	<i>Bubulcus ibis</i>	Cattle Egret	+	+	
98.	<i>Ardeola bacchus</i>	Chinese Pond Heron	+	+	+
99.	<i>Butorides striatus</i>	Little Heron	+	+	
100.	<i>Ixobrychus cinnamomeus</i>	Cinnamon Bittern		+	

No	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
	XIV. PASSERIFORMES				
	26. Pittidae				
101.	<i>Pitta oatesi</i>	Rusty-naped Pitta	+		
102.	<i>Pitta elliotii</i>	Gurney's Pitta			+
	27. Eurylaimidae				
103.	<i>Psarisomus dalhousiae</i>	Long-tailed Broadbill	+		+
	28. Irenidae				
104.	<i>Irena puella</i>	Asian Fairy Bluebird	+	+	+
105.	<i>Chloropsis cochinchinensis</i>	Blue-winged Leafbird	+		+
106.	<i>Chloropsis hardwickii</i>	Orange-bellied Leafbird	+	+	
	29. Laniidae				
107.	<i>Lanius cristatus</i>	Brown Shrike		+	
108.	<i>Lanius colluriooides</i>	Burmese Shrike	+	+	+
109.	<i>Lanius schach</i>	Long-tailed Shrike	+		+
	30. Corvidae				
110.	<i>Urocissa erythrorhyncha</i>	Red-billed Blue Magpie	+		
111.	<i>Urocissa whiteheadi</i>	White-winged Magpie	+		+
112.	<i>Cissa hypoleuca</i>	Indochinese Green Magpie		+	
113.	<i>Cissa chinensis</i>	Common Green Magpie	+		
114.	<i>Dendrocitta formosae</i>	Grey Treepie	+		+
115.	<i>Crypsirina temia</i>	<i>Racked-tailed Treepie</i>	+	+	
116.	<i>Temnurus temnurus</i>	Ratchet-tailed Treepie	+		+
117.	<i>Corvus macrorhynchos</i>	Large-billed Crow	+		
118.	<i>Artamus fuscus</i>	Ashy Woodswallow		+	+
119.	<i>Oriolus chinensis</i>	Black-naped Oriole		+	
120.	<i>Oriolus traillii</i>	Maroon Oriole			+
121.	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike	+		
122.	<i>Coracina melaschistos</i>	Black-winged Cuckooshrike	+	+	
123.	<i>Pericrocotus roseus</i>	Rosy Minivet	+		
124.	<i>Pericrocotus solaris</i>	Grey-chinned Minivet		+	
125.	<i>Pericrocotus flammeus</i>	Scarlet Minivet	+	+	+
126.	<i>Hemipus picatus</i>	Bar-winged Flycatcher Shrike	+	+	
127.	<i>Rhipidura albicollis</i>	White-throated Fantail	+	+	+
128.	<i>Dicrurus macrocercus</i>	Black Drongo	+	+	+
129.	<i>Dicrurus leucophaeus</i>	Ashy Drongo	+	+	
130.	<i>Dicrurus annectans</i>	Crow-billed Drongo			+
131.	<i>Dicrurus aeneus</i>	Bronzed Drongo	+	+	+
132.	<i>Dicrurus remifer</i>	Lesser Racket-tailed Drongo	+		+
133.	<i>Dicrurus paradiseus</i>	Greater Racked-tailed Drongo	+		
134.	<i>Hypothymis azurea</i>	Black-naped Monarch	+	+	+
135.	<i>Terpsiphone paradisi</i>	Asian Paradise-flycatcher	+		+
136.	<i>Aegithina tiphia</i>	Common Iora	+	+	+
137.	<i>Aegithina viridissima</i>	Green Iora	+		
138.	<i>Aegithina lafresnayei</i>	Great Iora	+	+	

No	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
	31. Muscicapidae				
139.	<i>Monticola solitarius</i>	Blue Rockthrush		+	+
140.	<i>Myophonus caeruleus</i>	Blue Whistling Thrush	+	+	+
141.	<i>Zoothera dauma</i>	Scaly Thrush		+	
142.	<i>Zoothera marginata</i>	Dark-sided Thrush		+	
143.	<i>Turdus merula</i>	Eurasian Blackbird	+		
144.	<i>Turdus obscurus</i>	Eyebrowed Thrush		+	
145.	<i>Brachypteryx leucophrys</i>	Lesser Shortwing		+	
146.	<i>Muscicapa dauurica</i>	Asian Brown Flycatcher	+	+	+
147.	<i>Ficedula strophciata</i>	Rufous-gorgetted Flycatcher	+		
148.	<i>Ficedula parva</i>	Red-breasted Flycatcher	+		+
149.	<i>Niltava davidi</i>	Fujian Niltava	+		
150.	<i>Eumyias thalassina</i>	Verditer Flycatcher		+	+
151.	<i>Cyornis concreta</i>	White-tailed Flycatcher	+	+	
152.	<i>Cyornis hainanus</i>	Hainan Blue Flycatcher			+
153.	<i>Culicicapa ceylonensis</i>	Grey-headed Canary flycatcher	+		+
154.	<i>Luscinia sibilans</i>	Rufous-tailed Robin	+	+	
155.	<i>Luscinia calliope</i>	Siberian Rubythroat	+		
156.	<i>Luscinia cyane</i>	Siberian Blue Robin		+	
157.	<i>Tarsiger cyanurus</i>	Orange-flanked Bush Robin	+		
158.	<i>Copsychus saularis</i>	Oriental Magpie Robin	+	+	+
159.	<i>Copsychus malabaricus</i>	White-rumped Shama	+	+	
160.	<i>Myiomela leucura</i>	White-tailed Robin	+	+	
161.	<i>Enicurus schistaceus</i>	Slaty-backed Forktail	+	+	
162.	<i>Chaimarrornis leucocephalus</i>	White-capped Water Redstart			+
163.	<i>Saxicola torquata</i>	Common Stonechat		+	+
164.	<i>Saxicola ferrea</i>	Grey Bushchat	+	+	+
	32. Sturnidae				
165.	<i>Sturnus sericeus</i>	Red-billed Starling			+
166.	<i>Sturnus nigricollis</i>	Black-collared Starling		+	
167.	<i>Sturnus burmannicus</i>	Vinous-breasted Starling	+		
168.	<i>Acridotheres grandis</i>	White-vented Myna	+		
169.	<i>Acridotheres cristatellus</i>	Crested Myna	+	+	+
170.	<i>Gracula religiosa</i>	Hill Mynah	+		+
	33. Sittidae				
171.	<i>Sitta frontalis</i>	Velvet-fronted Nuthatch	+		
	34. Paridae				
172.	<i>Parus major</i>	Great Tit	+	+	+
173.	<i>Melanochlora sultanea</i>	Sultan Tit	+		
174.	35. Aegithalidae				
175.	<i>Aegithalos concinnus</i>	Black-throated Tit	+		
	36. Hirundinidae				
176.	<i>Hirundo rustica</i>	Barn Swallow	+	+	+
177.	<i>Hirundo daurica</i>	Red-rumped Swallow	+	+	+

No	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
	37. Pycnonotidae				
178.	<i>Pycnonotus atriceps</i>	Black-headed Bulbul	+		
179.	<i>Pycnonotus melanicterus</i>	Black-crested Bulbul	+	+	+
180.	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	+	+	+
181.	<i>Pycnonotus cafer</i>	Red-vented Bulbul		+	+
182.	<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul		+	
183.	<i>Pycnonotus sinensis</i>	Light-vented Bulbul	+		
184.	<i>Pycnonotus finlaysoni</i>	Stripe-throated Bulbul		+	
185.	<i>Alophoixus pallidus</i>	Puff-throated Bulbul	+	+	+
186.	<i>Iole propinqua</i>	Grey-eyed Bulbul	+	+	
187.	<i>Hypsipetes mcclllandii</i>	Mountain Bulbul	+	+	
188.	<i>Hypsipetes leucocephalus</i>	Black Bulbul	+		+
	38. Cisticolidae				
189.	<i>Cisticola juncidis</i>	Zitting Cisticola		+	+
190.	<i>Prinia rufescens</i>	Rufescent Prinia	+		+
191.	<i>Prinia hodgsonii</i>	Grey-breasted Prinia			+
	39. Zosteropidae				
192.	<i>Zosterops palpebrosus</i>	Oriental White-eye		+	+
193.	<i>Zosterops japonicus</i>	Japanese White-eye	+		+
	40. Sylviidae				
194.	<i>Tesia olivea</i>	Slaty-bellied Tesia			+
195.	<i>Tesia cyaniventer</i>	Grey-bellied Tesia			+
196.	<i>Bradypterus seebohmi</i>	Russet Bush Warbler	+		
197.	<i>Locustella lanceolata</i>	Lanceolated Warbler	+		
198.	<i>Orthotomus sutorius</i>	Common Tailorbird	+	+	+
199.	<i>Orthotomus atrogularis</i>	Dack-necked Tailorbird	+	+	+
200.	<i>Phylloscopus maculipennis</i>	Ashy-throated Warbler			+
201.	<i>Phylloscopus inornatus</i>	Yellow-browed Warbler	+		
202.	<i>Phylloscopus fuscatus</i>	Dusky Warbler		+	
203.	<i>Phylloscopus affinis</i>	Tickell's Leaf Warbler		+	
204.	<i>Phylloscopus proregulus</i>	Pallas' Leaf Warbler		+	+
205.	<i>Phylloscopus borealis</i>	Arctic Warbler	+	+	+
206.	<i>Phylloscopus davisoni</i>	White-tailed Leaf Warbler		+	+
207.	<i>Phylloscopus ricketti</i>	Sulphur-breasted Warbler			+
208.	<i>Abroscopus superciliaris</i>	Yellow-bellied Warbler	+		
209.	<i>Megalurus palustris</i>	Striated Grassbird			+
210.	<i>Garrulax perspicillatus</i>	Masked Laughingthrush	+		+
211.	<i>Garrulax leucolophus</i>	White-crested Laughingthrush	+	+	+
212.	<i>Garrulax monileger</i>	Lesser Necklaced Laughingthrush	+		
213.	<i>Garrulax chinensis</i>	Black-throated Laughingthrush	+	+	+
214.	<i>Garrulax canorus</i>	Hwamei	+	+	+
215.	<i>Garrulax sannio</i>	White-browed Laughingthrush			+
216.	<i>Pellorneum tickelli</i>	Buff-breasted Babbler	+	+	+

No	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
217.	<i>Pellorneum albiventre</i>	Spot-throated Babbler		+	
218.	<i>Pellorneum ruficeps</i>	Puff-throated Babbler	+	+	
219.	<i>Malacopteron cinereum</i>	Scaly-crowned Babbler	+		
220.	<i>Pomatorhinus hypoleucos</i>	Large Scimitar Babbler	+		
221.	<i>Pomatorhinus erythrogenys</i>	Rusty-cheeked Scimitar Babbler			+
222.	<i>Pomatorhinus schisticeps</i>	White-browed Scimitar Babbler	+	+	+
223.	<i>Pomatorhinus ferruginosus</i>	Coral-billed Scimitar Babbler			+
224.	<i>Napothera brevicaudata</i>	Streaked Wren Babbler			+
225.	<i>Napothera epilepidota</i>	Eyebrowed Wren Babbler			+
226.	<i>Stachyris rufifrons</i>	Rufous-fronted Babbler	+		
227.	<i>Stachyris nigriceps</i>	Grey-throated Babbler	+	+	
228.	<i>Stachyris striolata</i>	Spot-necked Babbler	+		+
229.	<i>Macronous gularis</i>	Striped Tit Babbler	+	+	+
230.	<i>Timalia pileata</i>	Chestnut-capped Babbler	+		
231.	<i>Leiothrix argentauris</i>	Silver-eared Mesia	+	+	+
232.	<i>Pteruthius flaviscapis</i>	White-browed Shrike Babbler			+
233.	<i>Alcippe vinipectus</i>	White-browed Fulvetta		+	
234.	<i>Alcippe rufogularis</i>	Rufous-throated Fulvetta	+		
235.	<i>Alcippe peracensis</i>	Mountain Fulvetta	+		
236.	<i>Alcippe brunnea</i>	Dusky Fulvetta			+
237.	<i>Alcippe poioicephala</i>	Brown-cheeked Fulvetta			+
238.	<i>Alcippe morrisonia</i>	Grey-cheeked Fulvetta			+
239.	<i>Yuhina zantholeuca</i>	White-bellied Yuhina			+
240.	<i>Yuhina nigrimenta</i>	Black-chinned Yuhina	+	+	
	41. Alaudidae				
241.	<i>Alauda gulgula</i>	Oriental Skylark	+	+	+
	42. Nectariniidae				
242.	<i>Dicaeum chrysorrheum</i>	Yellow-vented Flowerpecker		+	+
243.	<i>Dicaeum concolor</i>	Plain Flowerpecker	+	+	+
244.	<i>Dicaeum cruentatum</i>	Scarlet-backed Flowerpecker	+		
245.	<i>Hypogramma hypogrammicum</i>	Purple-naped Sunbird		+	
246.	<i>Antheptes singalensis</i>	Ruby-cheeked Sunbird			+
247.	<i>Aethopiga christinae</i>	Fork-tailed Sunbird	+		
248.	<i>Nectarinia jugularis</i>	Olive-backed Sunbird		+	
249.	<i>Aethopiga siparaja</i>	Crimson Sunbird	+		+
250.	<i>Arachnothera longirostra</i>	Little Spiderhunter	+	+	
251.	<i>Arachnothera affinis</i>	Grey-breasted Spiderhunter	+		
252.	<i>Arachnothera magna</i>	Streaked Spiderhunter	+	+	+
	43. Passeridae				
253.	<i>Passer montanus</i>	Eurasian Tree Sparrow	+	+	+

No	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
254.	<i>Motacilla alba</i>	White Wagtail	+	+	+
255.	<i>Motacilla flava</i>	Yellow Wagtail	+		
256.	<i>Motacilla cinerea</i>	Grey Wagtail	+	+	+
257.	<i>Anthus richardi</i>	Richard's Pipit	+	+	+
258.	<i>Anthus hodgsoni</i>	Olive-backed Pipit		+	
259.	<i>Anthus spinoletta</i>	Water Pipit		+	
260.	<i>Lonchura striata</i>	White-rumped Munia	+	+	+
261.	<i>Lonchura punctulata</i>	Scaly-breasted Munia		+	+
	44. Fringillidae				
262.	<i>Emberiza rutila</i>	Chestnut Bunting		+	

Annex 4.

List of Reptile and Amphibian species recorded in 3 NRs in TSHPP Catchment

No.	Scientific name	English name	Pu Hu	Xuan Nha	HK- PC
	I. SQUAMATA	I. SQUAMATA			
	1. Gekkonidae	1. Gekkons			
1	<i>Gekko gecko</i>	Tockay	+	+	+
2	<i>Hemidactylus frenatus</i>	Spiny-tailed House Gecko	+	+	+
	2. Agamidae				
3	<i>Acanthosaura lepidogaster</i>	Scale-bellied Tree Lizard	+	+	+
4	<i>Calotes mystaceus</i>	Maustached		+	
5	<i>Physignathus cocincinus</i>	Indochinese Water Dragon	+	+	+
	3. Scincidae				
6	<i>Eumes quadrilineatus</i>	Blue-tailed Skink			+
7	<i>Euremes tamdaoensis</i>	Tamdao blue-tailed Skink			+
8	<i>Mabuya chapaensis</i>	Sapa Skink		+	
9	<i>Mabuya longicaudata</i>	Long-tailed Skink	+	+	+
10	<i>Mabuya multifasciata</i>	Many-lined Sun Skink	+	+	+
	4. Lacertidae				
11	<i>Takydromus sexlineatus</i>	Srass Lizard		+	+
	5. Anguidae				
12	<i>Ophisaurus harti</i>	Asian Grass Lizard		+	
	6. Varanidae				
13	<i>Varanus salvator</i>	Water Monitor	+	+	
	7. Typhlopidae				
14	<i>Ramphotypholops braminus</i>	Common Blind Snake	+	+	
	8. Xenopeltidae				
15	<i>Xenopeltis unicolor</i>	Sunbeam Snake	+	+	+
	9. Boidae				
16	<i>Python molurus</i>	Burmere Python	+	+	+
	10. Colubridae				
17	<i>Ahaetulla prasina</i>	Oriental Whip Snake	+	+	+
18	<i>Amphiesma stolata</i>	Buff-striped Keelback		+	+
19	<i>Boiga multomaculata</i>	Multitemporaled Cat Snake		+	+
20	<i>Calamaria pavimenlata</i>	Collared Reed Snake		+	
21	<i>Cyclophiops multicinctus</i>	Munticincted Green Snake			+
22	<i>Dendrelaphis pictus</i>	Gmelin's Bronzeback	+		+
23	<i>Dinodon futsingensis</i>	Futsing Wolf Snake		+	
24	<i>Elaphe taeniura</i>	Taiwan Beauty Snake		+	+
25	<i>Elaphe radiata</i>	Copperhead Racer	+	+	+
26	<i>Elaphe porphyracea</i>	Black-banded Trinket Snake		+	+
27	<i>E. mandarnus</i>	Mandarin Rat Snake		+	
28	<i>E. moellendorffii</i>	Moellendorff's Rat Snake		+	+
29	<i>Enhydris plumbea</i>	Plumbeous Water Snake	+		+
30	<i>Pareas margaritophorus</i>	White-spotted Slug Snake			+
31	<i>Ptyas korros</i>	Indochinese Rat Snake	+	+	+
32	<i>P. mucosus</i>	Common Rat Snake		+	+

33	<i>Psammodynastes pulverulentus</i>	Mock viper		+	+
34	<i>Rhabdophis chrysagrus</i>	Speckle-bellied Keelback		+	+
35	<i>Rhabdophis subminiatus</i>	Red-necked Keelback		+	
36	<i>Xenochrophis piscator</i>	Checkered Keelback	+	+	+
37	<i>Sibynophis chinensis</i>	Chinese Mountain Snake			+
38	<i>Sinonatrix percarinata</i>	Mountain Water Snake		+	+
	11. Elapidae				
39	<i>Bungarus fasciatus</i>	Banded Krait	+	+	+
40	<i>Bungarus multicinctus</i>	Many Banded Krait	+	+	+
41	<i>Calliophis maccllellandi</i>	McClelland's Coral Snake		+	
42	<i>Naja atra</i>	Chinese Cobra	+	+	+
43	<i>Ophiophagus hannah</i>	King Cobra	+	+	+
	12. Viperidae				
44	<i>Trimeresurus albolabris</i>	Bamboo Snake	+	+	
45	<i>T. stejnegeri</i>	Bamboo Pit Viper		+	+
	II. TESTUDINATA				
46	13. Platysternidae				
47	<i>Platysternon megacephatum</i>	Big-headed Turtle	+	+	
	14. Emydidae				
48	<i>Cuora galbinifrons</i>	Indochinese Box Turtle		+	+
48	<i>Cuora trifasciata</i>	Chinese three-striped Box Turtle	+		
50	<i>Cyclemys tcheponensis</i>	Stripe-necked Leaf Tuetle			+
51	<i>Geoemyia spengleri</i>	Black-breasted Leaf Turtle	+		
52	<i>Ocadia sinensis</i>	Chinese Striped-neck Turtle		+	
53	<i>Pyxidea mouhoti</i>	Keeled Box Turtle		+	+
54	<i>Sacalia quadriocellata</i>	Four-eyed Turtle			+
	15. Testudinidae				
55	<i>Indotestudo elongata</i>	Elongated Tortoise			+
56	<i>Manouria impressa</i>	Impressed Tortoise	+	+	
	16. Trionychidae				
57	<i>Palea steindachneri</i>	Wattle-necked Softshell Turtle	+	+	
58	<i>Pelodiscus sinensis</i>	Chinese softshell Turtle	+		+
	AMPHIBIA	AMPHIBIANS			
	I. GYMNOPTIONA				
	1. Ichthyophis				
1	<i>Ichthyophis bannanicus</i>	Banna Caecilian			+
	II. ANURA				
	2. Megophryidae				
2	<i>Leptolalax pelodytoides</i>	Thao Asian Toad		+	+
3	<i>Megophrys longipes</i>	Malacca Spadefoot Toad		+	+
	3. Bufonidae				
4	<i>Bufo galeatus</i>	Gamboja Toad	+		
5	<i>Bufo melanostictus</i>	Asian Common Toad	+	+	+
	4. Ranidae				
6	<i>Amolops ricketti</i>	Chinese Sucker Frog		+	+
7	<i>Chaparana delacouri</i>	Tonkin Asian Frog			+

8	<i>Hoplobatrachus rugulosus</i>	Common Lowland Frog	+	+	+
9	<i>Huia nasica</i>	Tonkin Hiua Frog		+	
10	<i>Limnonectes kuhlii</i>	Kuhl's Creek Frog			+
11	<i>Limnonectes limnocharis</i>	Grass Frog	+	+	+
12	<i>Occidozyga laevis</i>	Yellow-bellied Puddle Frog		+	+
13	<i>Occidozyga lima</i>	Green Puddle Frog	+	+	
13	<i>Paa spinosa</i>	Giant Spiny Frog	+		+
15	<i>Paa verrucospinosa</i>	Granular Spiny Frog	+	+	+
17	<i>Rana andersoni</i>	Golden Crossband Frog			+
17	<i>Rana guentheri</i>	Gunther's Amoy Frog	+	+	
18	<i>Rana johnsi</i>	Johns' Frog		+	+
19	<i>Rana livida</i>	Tenasserim Frog	+	+	+
20	<i>Rana macrodactyla</i>	Guangdong Frog	+	+	+
21	<i>Rana maasonensis</i>	Maason Frog			+
22	<i>Rana nigrovittata</i>	Black-striped Frog		+	
23	<i>Rana taipehensis</i>	Taipei Frog		+	+
	5. Rhacophoridae				
24	<i>Chirixalus vittatus</i>	Striped Asian Treefrog		+	+
25	<i>Polypedates leucomystax</i>	Four-lined Treefrog	+	+	+
	6. Microhylidae				
26	<i>Microhyla bermorei</i>	Berdmore's Frog		+	
27	<i>Microhyla butleri</i>	Butler's rice Frog		+	+
28	<i>Microhyla marmorata</i>	Marble Pigmy Frog		+	+
29	<i>Microhyla ornata</i>	Ornate Pigmy Frog	+	+	
30	<i>Microhyra pulchra</i>	Guangdong Rice Frog	+	+	+

Annex 5. A list of plant species of national and international conservation significance in TSHPP area

(Note: RDBVN: Red Data Book of Vietnam (2007), IUCN: IUCN Red List (2007), End.VN: Endemic to Vietnam. CR: Critically endangered; EN: Endangeres; VU: Vulnerable; NT: Near threatened, LR/nt: Near threatened, DD: Data defficient)

TT	Scientific name	Cons. importance			Pu Hu	Xuan Nha	HK-PC
		RDB VN	IU CN	End. VN			
1.	<i>Acanthopanax trifoliatum</i> (L.)	EN			x	x	x
2.	<i>Acer tonkinensis</i> H. Lec.			+		x	
3.	<i>Actinodaphne ellipticibacca</i> Kosterm.	VU	VU		x	x	
4.	<i>Aglaia spectabilis</i> (Miq.) Jain. & Bennet.	VU	LR		x	x	
5.	<i>Alphonsea boniana</i> Fin. et Gagnep.			+	x	x	x
6.	<i>Alphonsea tonkinensis</i> DC.			+	x	x	x
7.	<i>Alstonia scholaris</i> R.Br.		LR		x	x	x
8.	<i>Amentotaxus yunnanensis</i> H.L.Li		EN			x	x
9.	<i>Ancistrocladus cochinchinensis</i> Gagnep.			+	x	x	
10.	<i>Angiopteris cochinchinensis</i> Vriese			+	x	x	
11.	<i>Anogeissus acumilata</i> var. <i>lanceolata</i> Wall ex Clark			+	x	x	
12.	<i>Antrophyum annamensis</i> Chr. & Tard.	VU				x	
13.	<i>Aquilaria crassna</i> Pierre ex Lecomte	EN	CR		x		
14.	<i>Barringtonia acutangula</i> (L.) Gaertn.			+	x	x	
15.	<i>Bauhinia acuminata</i> L.			+	x	x	x
16.	<i>Boehmeria tonkinensis</i> Gagn.			+		x	
17.	<i>Bridelia balansae</i> Tutch			+	x	x	
18.	<i>Burretiodendron tonkinensis</i> (Gagnep.) Chang & Miau	EN	EN		x	x	x
19.	<i>Calamus platyacanthus</i> Warb.	VU			x		
20.	<i>Calamus tetradactylus</i>	VU			x	x	x
21.	<i>Calamus tonkinensis</i> Becc.			+	x	x	
22.	<i>Callophyllum balansae</i> Pitard.	VU			x	x	
23.	<i>Calocedrus macrolepis</i> Kurz	EN	VU			x	
24.	<i>Canarium album</i> (Lour.) Raeusch			+	x	x	x
25.	<i>Canarium bengalense</i> Roxb.			+	x	x	x
26.	<i>Capparis tonkinensis</i> Gagn.			+	x	x	
27.	<i>Carydaphnopsis tonkinensis</i> (H.Lec.) Airy-Shaw			+	x	x	x
28.	<i>Caryota mitis</i> Lour.			+	x	x	x
29.	<i>Castanopsis annamensis</i> Hance			+	x		
30.	<i>Castanopsis chapaensis</i> Luong			+		x	x
31.	<i>Castanopsis tonkinensis</i> Seem			+	x	x	x
32.	<i>Cayra tonkinensis</i> Lee	VU				x	
33.	<i>Celastrus tonkinensis</i> Pitard			+		x	
34.	<i>Chisocheton cochinchinensis</i> Pierre			+	x	x	

TT	Scientific name	Cons. importance			Pu Hu	Xuan Nha	HK- PC
		RDB VN	IU CN	End. VN			
35.	<i>Chukrasia tabularis</i> A. Juss.	VU	LR		x	x	x
36.	<i>Cinnamomum balansae</i> Lec.	VU	EN		x	x	
37.	<i>Cinnamomum tonkiensis</i> (Lecomte) A. Chev.			+	x	x	
38.	<i>Costus tonkinensis</i> Gagnep.			+	x	x	x
39.	<i>Croton tonkinensis</i>			+	x	x	x
40.	<i>Cunninghamia knonishii</i> Hayata	VU	VU			x	
41.	<i>Cycas balansae</i> Warb.	VU	NT		x	x	x
42.	<i>Cycas pectinata</i> Griff.	VU	VU		x	x	x
43.	<i>Dacrydium elatum</i> (Roxb.) Wall. et Hook.		LR			x	x
44.	<i>Dacrycarpus imbricatus</i> (Bl.) De Laub.		LR			x	x
45.	<i>Dalbergia tonkinensis</i> Pierre		VU	+	x		
46.	<i>Desmos cochinchinensis</i> Lour.			+	x	x	x
47.	<i>Deutzianthus tonkinensis</i> Gagnep.			+	x	x	
48.	<i>Diospyros mun</i> A. Chev. ex Lecomte	EN	CR		x		
49.	<i>Dipterocarpus retusus</i> Blume	VU	VU		x	x	x
50.	<i>Disoxylum tonkinensis</i> A. Chev.			+	x	x	x
51.	<i>Dracontomelum duperreanum</i> Pierre			+	x	x	x
52.	<i>Drynaria bonii</i> (Kze) J. Sm.	VU			x	x	x
53.	<i>Drynaria fortunei</i> (O. Kuntze ex Mett.) J. Smith	EN			x	x	
54.	<i>Eberhardtia tonkinensis</i> H. Lec.			+		x	
55.	<i>Erythrophleum fordii</i> Oliv.		EN	+	x		
56.	<i>Eurya tonkinensis</i> Gagnep.			+		x	
57.	<i>Exbuclandia tonkinensis</i> (Lecomte) V. Steen			+		x	
58.	<i>Excoecaria cochinchinensis</i> Lour.			+	x	x	
59.	<i>Fallopia multiflora</i> (Thumb) Haraldson (E)	VU			x	x	x
60.	<i>Fokienia hodginsii</i> (Dunn) A. Henry et Thomas	EN	LR		x	x	x
61.	<i>Garcinia multiflora</i> Champ		LR		x	x	x
62.	<i>Garuga pinnata</i> Roxb.			+		x	
63.	<i>Gnetum latifolium</i> Bl. var. <i>blumei</i> Mgf			+	x	x	
64.	<i>Gnetum montanum</i> Mgf			+	x	x	
65.	<i>Goniothalamus vietnamensis</i> Ban	VU				x	
66.	<i>Grewia annamica</i> Gagnep.			+	x	x	x
67.	<i>Gymnopetalum cochichinensis</i> Kurz			+	x	x	x
68.	<i>Hernandia brilletti</i> Steenis			+	x	x	x
69.	<i>Hopea chinensis</i> () Hand.-Mazz.		CR		x	x	
70.	<i>Hopea mollissima</i> C.Y. Wu	VU	CR		x	x	
71.	<i>Hydnocarpus annamensis</i> H. Lec.		VU	+	x	x	
72.	<i>Hydnocarpus hainanensis</i> (Merr.) Sleum		VU		x	x	x
73.	<i>Hydnocarpus kurzii</i> (King) Warb.		DD		x	x	x

TT	Scientific name	Cons. importance			Pu Hu	Xuan Nha	HK- PC
		RDB VN	IU CN	End. VN			
74.	<i>Ilex rotunda</i> Thumb.			+	x	x	x
75.	<i>Impatiens claviger</i> Hook.f.			+	x	x	x
76.	<i>Jasminum longipetalum</i> King et Gamble			+	x	x	x
77.	<i>Justicia vagabunda</i> R.Ben.			+	x	x	x
78.	<i>Keteleeria evelyniana</i> Mast.	VU	LR			x	x
79.	<i>Khaya senegalensis</i> A.Juss.		VU		x	x	x
80.	<i>Kibatalia macrophylla</i> (Pitard) Woodson		LR		x	x	x
81.	<i>Knema tonkinensis</i> (Warb.) De Wilde			+			
82.	<i>Lasianthus annamicus</i> Pitard			+	x	x	x
83.	<i>Lasianthus baviensis</i> (Drake) Pitard			+	x	x	x
84.	<i>Lasianthus tonkinensis</i> (Drake) Pitard.			+	x	x	x
85.	<i>Licuala fatua</i> Beec			+	x	x	x
86.	<i>Lindera tonkinensis</i> Lec.			+	x	x	
87.	<i>Lithocarpus amygdalifolia</i> (Sken) Hayata	VU			x	x	x
88.	<i>Lithocarpus annamensis</i> (Hick. et A. Camus) Barn.			+	x		
89.	<i>Litsea baviensis</i> H. Lec.			+	x	x	x
90.	<i>Maclura cochinchinensis</i> Kudo et Masan.			+	x	x	
91.	<i>Madhuca pasquieri</i> H.J. Lamb	EN	VU		x	x	x
92.	<i>Mallotus cochinchinensis</i> Lour.			+	x	x	x
93.	<i>Mangifera foetida</i> Lour.		LR		x	x	x
94.	<i>Mangifera indica</i> L.		DD		x	x	x
95.	<i>Manglietia dandyi</i> (Gagnep.) Dandy	VU				x	x
96.	<i>Markhamia stipulata</i> (Wall.) Seem.	VU			x	x	x
97.	<i>Melodinus annamensis</i> Pitard		EN	+			x
98.	<i>Melodinus cochinchinensis</i> (Lour.) Merr.			+	x		
99.	<i>Michelia balansae</i> (A.DC.) Dandy	VU			x	x	x
100.	<i>Microlepidia marginata</i> (Houtt.) C. Chr.			+		x	
101.	<i>Nageia fleuryi</i> (Hiekel) de Laub		NT		x	x	x
102.	<i>Ormosia tonkinensis</i> Gagn.			+	x	x	
103.	<i>Pandanus tonkinensis</i> Martelli			+	x	x	x
104.	<i>Paramichelia baillonii</i> (Pierre) Hu	VU			x	x	
105.	<i>Parashorea chinensis</i> Wang Hsie		EN		x	x	x
106.	<i>Pauldopia ghorta</i> (G. Don) Steen	EN			x	x	x
107.	<i>Paviasia annamensis</i> Pierre			+	x	x	x
108.	<i>Phoebe macrocarpa</i> C.Y.Wu	VU			x	x	
109.	<i>Pinus kwangtungensis</i> Chun ex Tsiang	VU				x	x
110.	<i>Pinus merkusii</i> Jungh. & de Vriese		VU		x	x	x
111.	<i>Piper betle</i> L.			+	x	x	x
112.	<i>Piper bonii</i> DC.			+	x	x	x
113.	<i>Piper lolot</i> L.			+	x	x	x

TT	Scientific name	Cons. importance			Pu Hu	Xuan Nha	HK- PC
		RDB VN	IU CN	End. VN			
114.	<i>Plantanus kerrii</i> Gagnep.	VU				x	x
115.	<i>Pleomele cochinchinensis</i> il			+	x	x	x
116.	<i>Podocarpus macrophyllus</i> D.Don var. <i>maki</i> Endl		LR			x	x
117.	<i>Podocarpus neriifolius</i> D.Don		LR		x	x	x
118.	<i>Podocarpus pilgeri</i> Foxw.		CR			x	x
119.	<i>Protium serratum</i> (Wall. et Colebr) Engl	VU			x	x	x
120.	<i>Radermachera boniana</i> Dop.			+	x		
121.	<i>Raphidophora tonkinensis</i> Engl.			+		x	x
122.	<i>Rubus cochinchinensis</i> Tratt			+	x	x	x
123.	<i>Schefflera lencantha</i> R. Vig.			+	x	x	x
124.	<i>Semecarpus annamensis</i> Tard.			+	x		
125.	<i>Sindora tonkinensis</i> A.Chev.exK.etS.Larsen	EN	DD		x		
126.	<i>Smilax petelotii</i> T. Koyama	CR			x		
127.	<i>Stephania dielsiana</i> C.Y.Wu	VU			x	x	x
128.	<i>Strobilanthes brunnescens</i> R. Ben			+	x	x	
129.	<i>Strobilanthes multangurus</i> R. Ben			+		x	x
130.	<i>Stroblus tonkinensis</i> Lour.			+	x		
131.	<i>Strychnos</i> sp. G.Don			+	x	x	
132.	<i>Symplocos cochinchinensis</i> (Lour.) Moore			+	x	x	
133.	<i>Syzygium baviense</i> (Gagn.) Merr. & Perry			+	x	x	x
134.	<i>Tacca integrifolia</i> Ker.-Gaul.	VU			x		
135.	<i>Thumbergia eberhardtii</i> Benoist			+	x	x	
136.	<i>Toona ciliata</i> Roem		DD		x	x	
137.	<i>Trevesia palmata</i> (Roxb.) Vig.			+	x	x	x
138.	<i>Tsoongiodendron odorum</i> Chun	VU				x	
139.	<i>Uvaria boniana</i> Finet et Gagnep.			+	x	x	
140.	<i>Vaccinium tonkinense</i> Dop			+		x	x
141.	<i>Vatica diospyroides</i> Sym.		CR		x	x	x
142.	<i>Wrightia annamensis</i> Eberh.			+	x	x	x
143.	<i>Wrightia laevis</i> Hook.f.			+	x	x	

ANNEX 6. CONSERVATION NEED ASSESSMENT OF PU HU NATURE RESERVE

I. GENERAL INFORMATION

Assessment team:

Management Board of Pu Hu NR: Le Than Ngoi (Director), Vu Van Dat (Deputy-Director), Nguyen Dinh Hieu (Technical officer), Trinh Dang Tinh (Legislation officer)

Consultants: Nguyen Xuan Dang, Dang Ngoc Can, Do Huu Thu, Ngo Xuan Tuong

Date: 22 April 2008

Name of protected area	Pu Hu Nature Reserve
Location of protected area	Coordinate: 20° 22'30" – 20° 40'00" N. and 104° 40'00" – 105° 05'00" E In territory of 2 District (Quan Hoa and Muong Lat) of Thanh Hoa Province
Date of establishment	Decision 447/QĐ-UB, dated 20/3/1999 of Chairman of Thanh Hoa Provincial People Committee on approval of Investment plan of establishment of Pu Hu NR. Decision 741/QĐ-UB, dated 24/4/1999 of Chairman of Thanh Hoa Provincial People Committee on establishment of Management board of Pu Hu NR
Ownership details	Management Board of Pu Hu NR
Management Authority	Forest Protection Department of Thanh Hoa Province
Size of protected area (ha)	NR: 27.502,89ha ; Buffer zone: 87.336,34ha.
Designations (IUCN category)	Nature Reserve. IUCN Category Ib (Wilderness Area).
Brief details of government projects in protected areas	National Programme 661
List of top two protected area objectives	
Objective 1	Conservation of scientific values and typical biodiversity of North Central Vietnam and Northwest Thanh Hoa. Protection of watershed forest and supporting economic development in downstream area
Objective 2	Conservation of precious and rare species of flora and fauna, especially globally endangered wildlife species
Objective 3	Contribution to national security protection and social security of frontier area

II. ASSESSMENT OF MANAGEMENT CAPACITY (Quadrant with **bold letters** is selected one as best reflects situation of assessed NR)

Issue	Criteria	Score	Comments
1. Legal status Does the park have legal status?	The protected area is not gazetted	0	<ul style="list-style-type: none"> Decision 447/QĐ-UB, dated 20/3/1999 of Chairman of Thanh Hoa Provincial People Committee on approval of Investment plan of establishment of Pu Hu NR. Decision 741/QĐ-UB, dated 24/4/1999 of Chairman of Thanh Hoa Provincial People Committee on establishment of Management board of Pu Hu NR
	The government has agreed that the protected area should be gazetted but has done nothing about it as yet	1	
	The protected area is in the process of being gazetted but the process is still incomplete	2	
	The protected area has been legally gazetted (or in the case of private reserves is owned by a trust or similar)	3	
2. Protected area regulations Are inappropriate land uses and activities (e.g. poaching) controlled? <i>Context</i>	Mechanisms for controlling inappropriate land use and activities in the protected area are not in place	0	<ul style="list-style-type: none"> Staff members lack of conservation experience Lack of equipment for conservation activities Very high pressure from 11 buffer zone communes, especially, H'Mong minority with very strong tradition of nomadic life, shifting cultivation, wildlife hunting and free-ranging cattle There is one village (Co Cai Village, Trung Ly Commune, 46 households) situated inside NR Two communes have agriculture lands inside NR
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are major problems in implementing them effectively	1	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are some problems in effectively implementing them	2	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist and are being effectively implemented	3	
3. Law enforcement Can staff enforce protected area rules	The staff have no effective capacity to enforce protected area legislation and regulations	0	Management Board of Pu Hu NR has 38 staff members (7 members less than planned in the already approved Investment Plan of Pu Hu NR, 1999) of which 24 are graduated universities or
	There are major deficiencies in staff capacity to enforce protected area legislation and regulations (e.g. lack of skills, low patrol capacity)	1	

Issue	Criteria	Score	Comments
well enough? <i>Context</i>	The staff have acceptable capacity to enforce protected area legislation and regulations but some deficiencies remain	2	high schools, 13 are graduated forestry vocational schools and 3 has no vocational training. Majority of the NRs staff members are young with limited professional experience and has not receive appropriate training on law enforcement and conservation skill.
	The staff have excellent capacity to enforce protected area legislation and regulations	3	
4. Protected area objectives Have objectives been agreed? <i>Planning</i>	No firm objectives have been agreed for the protected area	0	General management objectives of NR were defined by scientists and approved by related stakeholders, however, detailed objectives are not determined
	There are some objectives, but these are out-dated and bear little resemblance to the way that the site is managed	1	
	There are clear objectives for the establishment and management of the protected area, but these were set by a few professionals	2	
	The protected area has clear objectives agreed by a wide range of stakeholders	3	
5. Protected area boundary design Does the protected area need enlarging, corridors etc to meet its objectives? <i>Planning</i>	Inadequacies in boundary design mean that achievement of major objectives of the protected area is impossible	0	<ul style="list-style-type: none"> In general, boundary design is suitable for biodiversity conservation, however, in the field, the boundary is not clear in some areas causing difficulty for NR management Co Cai village with 46 households, 215 people is located inside Strict Protection Zone of NR
	Inadequacies in boundary design mean that achievement of major objectives of the protected area are constrained to some extent	1	
	Boundary design is not constraining achievement of major objectives of the protected area	2	
	Reserve design features are significantly aiding achievement of major objectives of the protected area	3	
6. Protected area boundary	The boundary of the protected area is not known by the management authority or local residents	0	<ul style="list-style-type: none"> The NR boundary was firstly demarcated in the field, however, due to recent revision of

Issue	Criteria	Score	Comments
	The boundary of the protected area is known by the management authority but is not known by local residents	1	
	The boundary of the protected area is known by both the management authority and local residents but is not fully demarcated	2	
	The boundary of the protected area is known by the management authority and local residents and is fully demarcated	3	
7. Management plan	There is no management plan for the protected area	0	<ul style="list-style-type: none"> Investment plan was revised for period 2006-2010 and approved by People Committee of Thanh Hoa Province A management Plan (2005-2009) has been developed by NR Management Board in collaboration with SNV staff consultants in 2004 but there no budget for implementation
Is there a management plan and is it being implemented?	A management plan is being prepared or has been prepared but is not being implemented	1	
	An approved management plan exists but it is only being partially implemented because of funding constraints or other problems	2	
	An approved management plan exists and is being implemented	3	
<i>Planning</i>			
8. Annual work plan	No annual work plan exists	0	<ul style="list-style-type: none"> NR Management board develops annual work plan based on available budget from Province budget and Programme 661. The annual plan was monitored however many activities described in Investment Plan can not implement due to lack of fund.
Is there an annual work plan?	An annual work plan and actions but activities are not monitored against this	1	
	An annual work plan exists and actions are monitored against this, but many activities are not completed	2	
	An annual work plan exists, and actions are monitored against this and most or all prescribed activities are completed	3	
<i>Planning/Outputs</i>			
9. Resource inventory	There is little or no information available on the critical habitats, species and cultural values of the protected area	0	<ul style="list-style-type: none"> There was a very preliminary biodiversity survey for development of Investment plan in 1998 Baseline assessment of NR biodiversity and ecological studies of some endangered species
Do you have enough information to	Information on the critical habitats, species and cultural values of the protected area is not sufficient to support planning and decision making	1	

Issue	Criteria	Score	Comments
manage the area? <i>Context</i>	Information on the critical habitats, species and cultural values of the protected area is sufficient for key areas of planning/decision making but the necessary survey work is not being maintained	2	<ul style="list-style-type: none"> were planned to conduct, but no fund allocated for implementation Lack of information on population station of species of national and international conservation significance
	Information concerning on the critical habitats, species and cultural values of the protected area is sufficient to support planning and decision making and is being maintained	3	
10. Research Is there a programme of management-orientated survey and research work? <i>Inputs</i>	There is no survey of research work	0	<ul style="list-style-type: none"> There is planned baseline biodiversity assessment in Investment plan but not yet implemented There is no research of biodiversity in NR
	There is some ad hoc survey and research work	1	
	There is considerable survey and research work but no overall programme	2	
	There is a comprehensive, integrated programme of survey and research work	3	
11. Resource management Is the protected area adequately managed (e.g. for fire, invasive species, poaching)? <i>Process</i>	Requirements for active management of critical ecosystems, species and cultural values have not been assessed	0	<ul style="list-style-type: none"> Lack of basic information on status, distribution and habitat requirement of species of national and international conservation significance. There is no plan/strategies for management of key ecosystem and species
	Requirements for active management of critical ecosystems, species and cultural values are known but are not being addressed	1	
	Requirements for active management of critical ecosystems, species and cultural values are only being partially addressed	2	
	Requirements for active management of critical ecosystems, species and cultural values are being substantially or fully addressed	3	

Issue	Criteria	Score	Comments
12. Staff numbers Are there enough people employed to manage the protected area? <i>Inputs</i>	There are no staff	0	<ul style="list-style-type: none"> Management board now has 38 members while 45 members requested as in approved Investment Plan Most of staff members lack of conservation experience and knowledge
	Staff numbers are so inadequate that they seriously hamper site management	1	
	Staff numbers are below optimum level	2	
	Staff numbers, are in tune with the management needs of the site	3	
13. Staff training Is there enough training for staff? <i>Inputs/Process</i>	Staff are untrained	0	<ul style="list-style-type: none"> All staff members of NR Management Board have not received any training on conservation knowledge and skills
	Staff training and skills are inadequate for the needs of the protected area	1	
	Staff training and skills are acceptable, but could be further improved to fully achieve the goals/objectives of management	2	
	Staff training and skills are perfectly in tune with the management needs of the site	3	
14. Current budget Is the current budget sufficient? <i>Inputs</i>	There is no budget for the protected area	0	Annual budget comes from 2 sources: <ul style="list-style-type: none"> Provincial budget (Thanh Hoa) which will generally pay for salary of staff members and NR protection activities. National Programme 661 to pay for contracting local communities to protect forest and forest fire prevention activities. This Programme will finish in 2010 . Budget is not enough to implement of activities planned in Investment Plan
	The available budget is inadequate and presents a serious constraint to the capacity to manage	1	
	The available budget is acceptable, but could be further improved to fully achieve effective management	2	
	The available budget is sufficient and meets the management needs of the site	3	
15. Security of budget	There is no secure budget for the protected area and management is wholly reliant on outside funding	0	<ul style="list-style-type: none"> Budget portion from Provincial administration budget is secure but not

Issue	Criteria	Score	Comments
Is the budget secure? <i>Inputs</i>	There is very little secure budget and the protected area could not function adequately without outside funding	1	enough to implement all activities in Investment Plan, especially conservation and research
	There is a reasonably secure core budget for the protected area but many innovations and initiatives are reliant on outside funding	2	
	There is a secure budget for the protected area and its management needs	3	
16. Management of budget Is the budget managed well enough? <i>Process</i>	Budget management is very bad and significantly undermines effectiveness	0	Accountant need better training on budget management
	Budget management is poor and constrains effectiveness	1	
	Budget management is adequate but could be improved	2	
	Budget management is excellent and aids effectiveness	3	
17. Maintenance Is equipment adequately maintained? <i>Process</i>	No maintenance of equipment/facilities is undertaken	0	Received budget is poor not enough for regular maintenance
	Maintenance is undertaken only on an ad hoc or emergency basis	1	
	Most equipment/facilities are regularly maintained	2	
	All equipment/facilities are regularly maintained	3	
18. Personnel management Are the staff managed well enough? <i>Process</i>	Problems with personnel management significantly constrain management effectiveness	0	<ul style="list-style-type: none"> Management Board has a personnel planning with clear duty designated to each staff members, however, policy of periodical change of forest rangers makes the planning difficult
	Problems with personnel management partially constrain management effectiveness	1	
	Personnel management is adequate but could be improved	2	
	Personnel management is excellent and aids effectiveness	3	
19. Communication and outreach	There is little or no communication between managers and stakeholders involved in the protected area	0	There is communication between managers and

Issue	Criteria	Score	Comments
Is there a planned communication and outreach programme? <i>Process</i>	There is communication between managers and stakeholders but this is ad hoc and not part of a planned communication programme	1	stakeholders for information exchange on ad hoc basis
	There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders but implementation is limited	2	
	There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders	3	
20. State and commercial neighbours Is there cooperation with adjacent land users? <i>Process</i>	There is no contact between managers and neighboring official or corporate land users	0	<ul style="list-style-type: none"> • There is collaboration with local authorities and related agencies, however, the collaboration is still low effective • There is no plan for regular cooperation
	There is limited contact between managers and neighboring official or corporate land users	1	
	There is regular contact between managers and neighboring official or corporate land users, but only limited co-operation	2	
	There is regular contact between managers and neighbouring official or corporate land users, and substantial cooperation on management	3	
21. Indigenous people Do indigenous and traditional peoples resident or regularly using the PA have input to management decisions? <i>Process</i>	Indigenous and traditional peoples have no input into decisions relating to its management	0	<ul style="list-style-type: none"> • Not all, but some management decisions such as boundary demarcation, forest protection contracting, etc. has direct involvement of indigenous people. • Management Plan is developed with consultancy of local communities but not yet implemented
	Indigenous and traditional peoples have some input into discussions relating to its management but no direct involvement in decisions	1	
	Indigenous and traditional peoples directly contribute to some decisions relating to its management	2	
	Indigenous and traditional peoples directly contribute to all decisions relating to its management	3	

Issue	Criteria	Score	Comments
22. Local communities Do local communities resident or near the protected area have input to management decisions? <i>Process</i>	Local communities have no input into decisions relating to its management	0	<ul style="list-style-type: none"> Not all, but some management decisions such as boundary demarcation, forest protection contracting, etc. has direct involvement of indigenous people. Management Plan is developed with consultancy of local communities but not yet implemented
	Local communities have some input into discussions relating to its management but no direct involvement in the resulting decisions	1	
	Local communities directly contribute to some decisions relating to its management	2	
	Local communities directly contribute to most decisions relating to its management	3	
23. Visitor facilities Are visitor facilities (for tourists, pilgrims etc) good enough? <i>Outputs</i>	There are no visitor facilities and services	0	The NR has good potential for tourism development but no facilities are developed
	Visitor facilities and services are inadequate for current levels of visitation	1	
	Visitor facilities and services are adequate for current levels of visitation	2	
	Visitor facilities and services are excellent for current levels of visitation	3	
24. Commercial tourism Do commercial tour operators contribute to protected area management? <i>Process</i>	There is little or no contact between managers and tourism operators using the protected area	0	Not evaluated
	There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters	1	
	There is limited co-operation between managers and tourism operators to enhance visitor experiences and protect park values	2	
	There is excellent co-operation between managers and tourism operators to enhance visitor experiences and protect park values	3	
25. Tourism fees	There is no fee for visiting the protected area	0	<ul style="list-style-type: none"> Not evaluated

Issue	Criteria	Score	Comments
Does the protected area charge fees for tourists? <i>Outputs</i>	There is a fee for visiting the protected area, but it goes straight to central government and is not returned to the park or its environs	1	
	There is a fee for visiting the protected area, that ends up with the local authority	2	
	There is a fee for visiting the protected area that helps to support this or other protected areas	3	
26. Condition assessment Is the protected area being managed consistent to its objectives? <i>Outcomes</i>	Many of the most important biodiversity, ecological and cultural values are being severely degraded	0	<ul style="list-style-type: none"> • During first stage of investment plan, some protection activities have been conducted, wildlife hunting and forest products harvest reduced in some level. Shortage of budget significantly reduces effectiveness of protection activities • Lack of adequate information on NR biodiversity • There is no monitoring and evaluation system.
	Some of the most important biodiversity, ecological and cultural values are being severely degraded	1	
	Some biodiversity, ecological and cultural values are being partially degraded but the most important values have not been significantly impacted	2	
	Biodiversity, ecological and cultural values are predominantly intact	3	
27. Access assessment Are the available management mechanisms working to control access or use? <i>Outcomes</i>	Protection systems (patrols, permits etc) are ineffective in controlling access or use of the reserve in accordance with designated objectives	0	<ul style="list-style-type: none"> • Lacks of patrol routes coming deeply inside NR, current patrol mostly follows existing road and Ma River in buffer zone
	Protection systems are only partially effective in controlling access or use of the reserve in accordance with designated objectives	1	
	Protection systems are moderately effective in controlling access or use of the reserve in accordance with designated objectives	2	
	Protection systems are largely or wholly effective in controlling access or use of the reserve in accordance with designated objectives	3	

Issue	Criteria	Score	Comments
28. Economic benefit assessment Is the protected area providing economic assessments to local communities? <i>Outcomes</i>	There is little or no flow of economic benefits to local communities from the existence of the protected area	0	<ul style="list-style-type: none"> Contracting forest for protection and for natural generation brings some economic benefit to local communities though still limited
	There is some flow of economic benefits to local communities from the existence of the protected area but this is of minor significance to the regional economy.	1	
	There is a flow of economic benefits to local communities from the existence of the protected area and this is of moderate or greater significance to the regional economy but most of this benefit accrues from activities outside the park boundary (e.g. spending by visitors getting to the park).	2	
	There is a major flow of economic benefits to local communities from the existence of the protected area and a significant proportion of this derives from activities on the park (e.g. employment of locals, locally operated commercial tours etc).	3	
29. Monitoring and evaluation <i>Planning/Process</i>	There is no attempt at monitoring and evaluation in the protected area	0	<ul style="list-style-type: none"> There is no system of evaluation criteria NR staff members have no experience development of monitoring system Lacks of equipment for monitoring and evaluation
	There is some ad hoc monitoring and evaluation, but no overall strategy and/or no regular collection of results	1	
	There is an agreed and implemented monitoring and evaluation system but results are not systematically used for management	2	
	A comprehensive monitoring and evaluation exists, is well implemented and used in adaptive management	3	
TOTAL SCORE (MAXIMUM POSSIBLE SCORE 91):		31/91	

III. THREATS ASSESSMENT

Direct threat	Description	Ranking
1. Illegal timber extraction	<p>Illegal timber extraction from NR is made by local residents and occurs all around year, but with small scale, mainly selected cutting of some valuable timber species such as <i>Parashorea chinensis</i>, <i>Manglietia fordiana</i>, <i>Michelia spp.</i>, <i>Chukrasia tabularis</i>, <i>Fokenia sp.</i>, etc. Illegal timber extraction occurs in areas close to villages or in boundary areas. Local residents cut timbers for local use (house construction, making instruments) and also for sale. The demand of timber for house construction of local communities are very high. The reason is that local residents are too poor to make brick houses and also local ethnic groups (Thai and Muong) want to keep their long tradition of living in wooden houses on stilts. As usually, one wooden house in stilts needs about 20-39 m³ of timber and in order to have this amount of timber, the people have to cut a bout 50- 100m³ of round wood. Illegal timber extraction leads to degradation of forest quality, modification of forest structure and species composition, destruction of forest canopy that is very important for many endangered animal species.</p>	3
2. Hunting and Trapping wildlife	<p>Hunting and trapping wildlife in NR is taken mainly by local residents. This is a long tradition of local ethnic communities. Wild animals are hunted by guns, hunting dogs, bows and many kind of traps, of which hunting by guns and dogs are the most dangerous to wildlife. Management board of Pu Hu NR in collaboration with local authorities have conducted campaign for confiscation of guns from buffer zone communes, however, due to gun use is a long tradition of local ethnic minorities and they can produce hunting guns themselves, the guns continue to be used for hunting in the area. It is very difficult for enforcement people to control the guns because the hunters usually hide their guns in forests. Hunting occurs all around year (mostly from October to March next year). The hunters kill or catch any animals they encounter in forest. In the past, hunted animals were mainly for local use as supplementary food to their families, however, now hunted large animals are for sale to local restaurants or transported to big towns and cities for sale.</p>	1

3. Forest clearance for agriculture cultivation	Local ethnic groups (Thai, Muong, and H'Mong people) has a long tradition of shifting cultivation. At present, this practice is still commonly used due to various reasons such as slope land, limited land area for cultivation, lack of irrigation system, disadvantage cultivation technology that lead to rapid soil erosion and fertile degradation. Upland fields are usually made by clearance of old field land, scrublands, grasslands and regenerating young forests. However, local people (especially, H'Mong minority) also often clear forests of NR which are situated close to villages for their upland field. The reason is that local people face with limitation of cultivation land and tend to increase their land, and mainly, forest land of NR is always has higher fertility. At present, Co Cai village of Trung Ly commune is still located deep inside strict protection zone of NR which cause very high risk of NR's forest clearance for agriculture cultivation. The risk of NR's forest clearance is also high in buffer zone villages, especially, villages of H'Mong people. It also often happens in Phu Son, Thanh Xuan and Trung Ly communes. Forest clearance for agriculture cultivation is the most dangerous threat, that cause forest loss and disturbance of normal forest restoration.	2
4. Over-harvesting NTFPs	Local residents have long tradition of harvesting and use of many kinds of NTFPs. Some kinds of now commonly harvested NTFPs are medicine plants, rattans, bamboos, young bamboo shoots, fuelwood, honey, orchids, palm leaves, weed plants, etc. Except for palm leave which are used mainly locally for house roof making and for fuel, other products are collected mainly for sale. Various family members can do NTFPs harvesting. Depending on kind of products, harvesting may occurs seasonally or all around year. Harvested products are sold locally because traders usually come directly to villages or commune centre for buying. Un-controlled over-harvesting of NTFPs has made several kind of products become rare or exhausted in the area such as sent wood <i>Aquilaria sp.</i> , rattans, medicine plant <i>Elettaria cardamomum</i> , etc. This activities can cause great disturbance to wildlife habitats in the NR.	4
5. Forest fire	The reasons of forest fires are annual field burning or use of fire in forest by hunters, bee honey collectors, etc. Forest fires often occur in dry season from November to May next year in Ecological Restoration of NR. At present, influence of forest fire on NR's biodiversity is small, however, the risk of forest fire is high and it can lead to damage of forest area, degradation forest quality, disturbance of natural forest regeneration.	5
6. Free-ranging cattle raising	Lack of cattle raising ground is the reason of widespread free-ranging cattle raising practice in Pu Hu NR. Buffaloes, cows and goats are left free in NR's forest, and will be taken back to villages when the hosts need them for working or for sale. Local authorities still have no regulations for management of cattle raising.	6

ANNEX 7. CONSERVATION NEED ASSESSMENT OF XUAN NHA NATURE RESERVE

I. GENERAL INFORMATION

Assessment team:

Management Board of Xuan Nha NR: Dinh Van Thuan (Director), Nguyen Hung Chien (Technical officer)

Consultants: Nguyen Xuan Dang, Dang Ngoc Can, Ngo Xuan Tuong

Date: 7 May 2008

Name of protected area	Xuan Nha Nature Reserve
Location of protected area	Coordinate: 20 ⁰ 34'45" - 20 ⁰ 54'54" N; 104 ⁰ 28'42" – 104 ⁰ 50'26"E In territory of Moc Chau District, Son La Province
Date of establishment	Decision 194/CP, dated 19 August 1986 of Chairman Ministers Council (now, Prime Minister). Decision 3440/2002/QĐ-UB, dated 11 December 2002 of Chairman of Son La Provincial People Committee on establishment of Management board of Xuan Nha NR
Ownership details	Management Board of Xuan Nha NR
Management Authority	Forest Protection Department of Son La Province
Size of protected area (ha)	- At Decision 2288/QĐ-UBND, dated 16 August 2004 of Chairman of Son La Province People Committee, NR area: 27.084 ha. - At Decision 2955/ QĐ-UBND, dated 17 December 2007 of Chairman of Son La Province People Committee, NR area: 16.316,8 ha . - Buffer zone: 27.306,2ha .
Designations (IUCN category)	Nature Reserve. IUCN Category Ib (Wilderness Area).
Brief details of government projects in protected areas	National Programme 661
List of top two protected area objectives	
Objective 1	Protection of Tropical and Sub-tropical forest ecosystems of Northwest Vietnam and Son La Province in particular
Objective 2	Conservation of precious and rare species of flora and fauna existing in NR
Objective 3	Watershed protection for Ma and Da rivers; environment protection and climate regulation for Moc Chau, Mai Chau District (Son La Province), and Ba Thuoc District (Thanh Hoa Province).

II. ASSESSMENT OF MANAGEMENT CAPACITY (Quadrant with **bold letters** is selected one as best reflects situation of assessed NR)

Issue	Criteria	Score	Comments
1. Legal status Does the park have legal status?	The protected area is not gazetted	0	<ul style="list-style-type: none"> Decision 194/CP, dated 19 August 1986 of Chairman Ministers Council (now, Prime Minister). Decision 3440/2002/QĐ-UB, dated 11 December 2002 of Chairman of Son La Provincial People Committee on establishment of Management board of Xuan Nha NR
	The government has agreed that the protected area should be gazetted but has done nothing about it as yet	1	
	The protected area is in the process of being gazetted but the process is still incomplete	2	
	The protected area has been legally gazetted (or in the case of private reserves is owned by a trust or similar)	3	
2. Protected area regulations Are inappropriate land uses and activities (e.g. poaching) controlled? <i>Context</i>	Mechanisms for controlling inappropriate land use and activities in the protected area are not in place	0	<ul style="list-style-type: none"> Staff members lack of conservation experience Lack of equipment for conservation activities High pressure from 3 buffer zone communes, especially, H'Mong minority with very strong tradition of nomadic life, shifting cultivation, wildlife hunting and free-ranging cattle There is 4 villages of H'Mong Minority situated inside NR. Son La PC already decided to remove these villages out of NR In 2006-2007, Management Board in collaboration with local authorities revised the boundary to exclude villages and agriculture land from NR boundary
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are major problems in implementing them effectively	1	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are some problems in effectively implementing them	2	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist and are being effectively implemented	3	
3. Law enforcement Can staff enforce protected area rules	The staff have no effective capacity to enforce protected area legislation and regulations	0	Management Board now has 23 staff members, of which 10 have experience in law enforcement, others are young with limited professional experience and has not receive appropriate
	There are major deficiencies in staff capacity to enforce protected area legislation and regulations (e.g. lack of skills, low patrol capacity)	1	

Issue	Criteria	Score	Comments
well enough? <i>Context</i>	The staff have acceptable capacity to enforce protected area legislation and regulations but some deficiencies remain	2	training on law enforcement and conservation skill.
	The staff have excellent capacity to enforce protected area legislation and regulations	3	
4. Protected area objectives Have objectives been agreed? <i>Planning</i>	No firm objectives have been agreed for the protected area	0	General management objectives of NR were defined by a group scientists and approved in stakeholders workshop, however, detailed objectives are not determined
	There are some objectives, but these are out-dated and bear little resemblance to the way that the site is managed	1	
	There are clear objectives for the establishment and management of the protected area, but these were set by a few professionals	2	
	The protected area has clear objectives agreed by a wide range of stakeholders	3	
5. Protected area boundary design Does the protected area need enlarging, corridors etc to meet its objectives? <i>Planning</i>	Inadequacies in boundary design mean that achievement of major objectives of the protected area is impossible	0	<ul style="list-style-type: none"> In general, boundary design is suitable for biodiversity conservation, however, in the field, the boundary is not clear in some areas causing difficulty for NR management NR boundary was revised in 2007 to exclude 5 compartments for protection forest and agriculture land, Local communities do not know new boundary There is 5 villages located inside Strict Protection Zone of NR: Ban Lun, Ban Lay, A Lang, Cot Moc and Sa Lai Communes causing much difficulties for NR management
	Inadequacies in boundary design mean that achievement of major objectives of the protected area are constrained to some extent	1	
	Boundary design is not constraining achievement of major objectives of the protected area	2	
	Reserve design features are significantly aiding achievement of major objectives of the protected area	3	

Issue	Criteria	Score	Comments
6. Protected area boundary demarcation Is the boundary known and demarcated? <i>Context</i>	The boundary of the protected area is not known by the management authority or local residents	0	<ul style="list-style-type: none"> NR boundary was revised in 2007 to exclude 5 compartments for protection forest and agriculture land, Local communities do not know new boundary A number old boundary posts and sign-boards have been spoiled should be renovated Most of local residents do not know the NR boundary
	The boundary of the protected area is known by the management authority but is not known by local residents	1	
	The boundary of the protected area is known by both the management authority and local residents but is not fully demarcated	2	
	The boundary of the protected area is known by the management authority and local residents and is fully demarcated	3	
7. Management plan Is there a management plan and is it being implemented? <i>Planning</i>	There is no management plan for the protected area	0	<ul style="list-style-type: none"> Investment plan was and approved in 2004 by People Committee of Son La Province (Decision 2288/ QĐ-UBND, dated 16 August 2004 of Chairman of People Committee of Son La Province) however mostly not yet implemented due lack of budget and other reasons
	A management plan is being prepared or has been prepared but is not being implemented	1	
	An approved management plan exists but it is only being partially implemented because of funding constraints or other problems	2	
	An approved management plan exists and is being implemented	3	

Issue	Criteria	Score	Comments
8. Annual work plan Is there an annual work plan? <i>Planning/Outputs</i>	No annual work plan exists	0	<ul style="list-style-type: none"> NR Management board develops annual work plan but focusing on law enforcement not yet conservation activities. Annual plan was developed based on available budget allocated from Provincial administration budget Management Plan was developed for 2005-2009 by Management board and Netherlands SNV consultants but no budget for implementation The annual plan was monitored however many activities described in Investment Plan can not implement due to lack of fund.
	An annual work plan and actions but activities are not monitored against this	1	
	An annual work plan exists and actions are monitored against this, but many activities are not completed	2	
	An annual work plan exists, and actions are monitored against this and most or all prescribed activities are completed	3	
9. Resource inventory Do you have enough information to manage the area? <i>Context</i>	There is little or no information available on the critical habitats, species and cultural values of the protected area	0	<ul style="list-style-type: none"> A biodiversity assessment was conducted in 2005-2006, however, limited results obtained and no monitoring programme developed There is limited information on population station of key species not enough to develop monitoring programme
	Information on the critical habitats, species and cultural values of the protected area is not sufficient to support planning and decision making	1	
	Information on the critical habitats, species and cultural values of the protected area is sufficient for key areas of planning/decision making but the necessary survey work is not being maintained	2	
	Information concerning on the critical habitats, species and cultural values of the protected area is sufficient to support planning and decision making and is being maintained	3	
10. Research Is there a programme of management-orientated survey	There is no survey of research work	0	There is no management- oriented research of biodiversity in NR
	There is some ad hoc survey and research work	1	
	There is considerable survey and research work but no overall programme	2	

Issue	Criteria	Score	Comments
and research work? <i>Inputs</i>	There is a comprehensive, integrated programme of survey and research work	3	
11. Resource management	Requirements for active management of critical ecosystems, species and cultural values have not been assessed	0	<ul style="list-style-type: none"> • Important ecosystems and species of high conservation significance are known but no conservation action conducted • Due to limited budget, there no plan for conservation of key ecosystems and species, at present, NR focuses only on management activities and some re-forestation activities
Is the protected area adequately managed (e.g. for fire, invasive species, poaching)? <i>Process</i>	Requirements for active management of critical ecosystems, species and cultural values are known but are not being addressed	1	
	Requirements for active management of critical ecosystems, species and cultural values are only being partially addressed	2	
	Requirements for active management of critical ecosystems, species and cultural values are being substantially or fully addressed	3	
12. Staff numbers	There are no staff	0	<ul style="list-style-type: none"> • Management Board has 23 staff members (only 9 has permanent staff membership other are contracted members) with 4 university graduated and others forestry vocational school graduated or without vocational training • Most of staff members lack of conservation experience and knowledge
Are there enough people employed to manage the protected area? <i>Inputs</i>	Staff numbers are so inadequate that they seriously hamper site management	1	
	Staff numbers are below optimum level	2	
	Staff numbers, are in tune with the management needs of the site	3	
13. Staff training	Staff are untrained	0	<ul style="list-style-type: none"> • All staff members of NR Management Board have not received any training on conservation knowledge and skills
Is there enough training for staff? <i>Inputs/Process</i>	Staff training and skills are inadequate for the needs of the protected area	1	
	Staff training and skills are acceptable, but could be further improved to fully achieve the goals/objectives of management	2	

Issue	Criteria	Score	Comments
	Staff training and skills are perfectly in tune with the management needs of the site	3	
14. Current budget	There is no budget for the protected area	0	Annual budget comes from 2 sources: <ul style="list-style-type: none"> • Provincial budget (Son La) which will generally pay for salary of staff members and NR protection activities (about 60 million VND per year) • National Programme 661 to pay for contracting local communities to protect forest and forest fire prevention activities (2007: 350 million VND, 2008: no more).
Is the current budget sufficient?	The available budget is inadequate and presents a serious constraint to the capacity to manage	1	
<i>Inputs</i>	The available budget is acceptable, but could be further improved to fully achieve effective management	2	
	The available budget is sufficient and meets the management needs of the site	3	
15. Security of budget	There is no secure budget for the protected area and management is wholly reliant on outside funding	0	<ul style="list-style-type: none"> • Budget portion from Provincial administration budget is secure but not enough to implement all activities in Investment Plan, especially conservation and research
Is the budget secure?	There is very little secure budget and the protected area could not function adequately without outside funding	1	
<i>Inputs</i>	There is a reasonably secure core budget for the protected area but many innovations and initiatives are reliant on outside funding	2	
	There is a secure budget for the protected area and its management needs	3	
16. Management of budget	Budget management is very bad and significantly undermines effectiveness	0	Accountant graduated Forestry University, need better training on budget management
Is the budget managed well enough?	Budget management is poor and constrains effectiveness	1	
<i>Process</i>	Budget management is adequate but could be improved	2	
	Budget management is excellent and aids effectiveness	3	
17. Maintenance	No maintenance of equipment/facilities is undertaken	0	One Car (Yaz) and one computer have regular

Issue	Criteria	Score	Comments
Is equipment adequately maintained? <i>Process</i>	Maintenance is undertaken only on an ad hoc or emergency basis	1	maintenance
	Most equipment/facilities are regularly maintained	2	
	All equipment/facilities are regularly maintained	3	
18. Personnel management Are the staff managed well enough? <i>Process</i>	Problems with personnel management significantly constrain management effectiveness	0	<ul style="list-style-type: none"> Management Board needs more staff members, clear duty assignment should be made
	Problems with personnel management partially constrain management effectiveness	1	
	Personnel management is adequate but could be improved	2	
	Personnel management is excellent and aids effectiveness	3	
19. Communication and outreach Is there a planned communication and outreach programme? <i>Process</i>	There is little or no communication between managers and stakeholders involved in the protected area	0	There is monthly meeting with border army chiefs and local authorities for information exchange and cooperation, however, cooperation is less effective due to limitation of fund
	There is communication between managers and stakeholders but this is ad hoc and not part of a planned communication programme	1	
	There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders but implementation is limited	2	
	There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders	3	

Issue	Criteria	Score	Comments
20. State and commercial neighbours Is there cooperation with adjacent land users? <i>Process</i>	There is no contact between managers and neighboring official or corporate land users	0	<ul style="list-style-type: none"> There is collaboration with local authorities, border army and related agencies, however, the collaboration is still low effective
	There is limited contact between managers and neighboring official or corporate land users	1	
	There is regular contact between managers and neighboring official or corporate land users, but only limited co-operation	2	
	There is regular contact between managers and neighbouring official or corporate land users, and substantial cooperation on management	3	
21. Indigenous people Do indigenous and traditional peoples resident or regularly using the PA have input to management decisions? <i>Process</i>	Indigenous and traditional peoples have no input into decisions relating to its management	0	Indigenous and traditional peoples are not involved into making management decision however, before application of any management decision Management board has a meeting with them for agreement.
	Indigenous and traditional peoples have some input into discussions relating to its management but no direct involvement in decisions	1	
	Indigenous and traditional peoples directly contribute to some decisions relating to its management	2	
	Indigenous and traditional peoples directly contribute to all decisions relating to its management	3	
22. Local communities Do local communities resident or near the protected area have input to management decisions? <i>Process</i>	Local communities have no input into decisions relating to its management	0	Local communities are consulted but not directly involved in making management decisions
	Local communities have some input into discussions relating to its management but no direct involvement in the resulting decisions	1	
	Local communities directly contribute to some decisions relating to its management	2	
	Local communities directly contribute to most decisions relating to its management	3	

Issue	Criteria	Score	Comments
23. Visitor facilities Are visitor facilities (for tourists, pilgrims etc) good enough? <i>Outputs</i>	There are no visitor facilities and services	0	The NR has good potential for tourism development but no facilities are developed
	Visitor facilities and services are inadequate for current levels of visitation	1	
	Visitor facilities and services are adequate for current levels of visitation	2	
	Visitor facilities and services are excellent for current levels of visitation	3	
24. Commercial tourism Do commercial tour operators contribute to protected area management? <i>Process</i>	There is little or no contact between managers and tourism operators using the protected area	0	Not evaluated
	There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters	1	
	There is limited co-operation between managers and tourism operators to enhance visitor experiences and protect park values	2	
	There is excellent co-operation between managers and tourism operators to enhance visitor experiences and protect park values	3	
25. Tourism fees Does the protected area charge fees for tourists? <i>Outputs</i>	There is no fee for visiting the protected area	0	<ul style="list-style-type: none"> Not evaluated
	There is a fee for visiting the protected area, but it goes straight to central government and is not returned to the park or its environs	1	
	There is a fee for visiting the protected area, that ends up with the local authority	2	
	There is a fee for visiting the protected area that helps to support this or other protected areas	3	
26. Condition assessment	Many of the most important biodiversity, ecological and cultural values are being severely degraded	0	<ul style="list-style-type: none"> Lack of adequate information on NR

Issue	Criteria	Score	Comments
Is the protected area being managed consistent to its objectives? <i>Outcomes</i>	Some of the most important biodiversity, ecological and cultural values are being severely degraded	1	biodiversity. There is no monitoring and evaluation system.
	Some biodiversity, ecological and cultural values are being partially degraded but the most important values have not been significantly impacted	2	
	Biodiversity, ecological and cultural values are predominantly intact	3	
27. Access assessment	Protection systems (patrols, permits etc) are ineffective in controlling access or use of the reserve in accordance with designated objectives	0	NR has 4 Guard Station (each station has 3-4 rangers), however, 3 station has no communication system, together with complicated terrain and villages situated inside NR, therefore, very difficult to control access to NR
Are the available management mechanisms working to control access or use? <i>Outcomes</i>	Protection systems are only partially effective in controlling access or use of the reserve in accordance with designated objectives	1	
	Protection systems are moderately effective in controlling access or use of the reserve in accordance with designated objectives	2	
	Protection systems are largely or wholly effective in controlling access or use of the reserve in accordance with designated objectives	3	
28. Economic benefit assessment	There is little or no flow of economic benefits to local communities from the existence of the protected area	0	<ul style="list-style-type: none"> Contracting forest for protection and for natural generation brings some economic benefit to local communities though still limited
Is the protected area providing economic assessments to local	There is some flow of economic benefits to local communities from the existence of the protected area but this is of minor significance to the regional economy.	1	

Issue	Criteria	Score	Comments
communities? <i>Outcomes</i>	There is a flow of economic benefits to local communities from the existence of the protected area and this is of moderate or greater significance to the regional economy but most of this benefit accrues from activities outside the park boundary (e.g. spending by visitors getting to the park).	2	
	There is a major flow of economic benefits to local communities from the existence of the protected area and a significant proportion of this derives from activities on the park (e.g. employment of locals, locally operated commercial tours etc).	3	
29. Monitoring and evaluation	There is no attempt at monitoring and evaluation in the protected area	0	<ul style="list-style-type: none"> • There is no system of evaluation criteria • NR staff members have no experience development of monitoring system • Lacks of equipment for monitoring and evaluation
<i>Planning/Process</i>	There is some ad hoc monitoring and evaluation, but no overall strategy and/or no regular collection of results	1	
	There is an agreed and implemented monitoring and evaluation system but results are not systematically used for management	2	
	A comprehensive monitoring and evaluation exists, is well implemented and used in adaptive management	3	
TOTAL SCORE (MAXIMUM POSSIBLE SCORE 91):		36/91	

III. THREATS ASSESSMENT

Direct threat	Description	Ranking
1. Illegal timber extraction	Illegal timber extraction from NR is made by local residents and occurs all around year, but with small scale, mainly selected cutting of some valuable timber species such as <i>Parashorea chinensis</i> , <i>Manglietia fordiana</i> , <i>Michelia spp.</i> , <i>Chukrasia tabularis</i> , <i>Fokenia sp.</i> , etc. Illegal timber extraction occurs in areas close to villages or in boundary areas. Local residents cut timbers for local use (house construction, making instruments) and sometimes for sale. Illegal timber extraction often occurs in Pha Luong village of Truong Son communes. The timbers are chopped into short pieces and transported to Moc Chau Town for sale.	3
2. Hunting and Trapping wildlife	Hunting and trapping wildlife in NR is taken mainly by local residents. This is a long tradition of local ethnic communities. Wild animals are hunted by guns, hunting dogs, bows and many kind of traps. Management board of Xuan Nha NR in collaboration with local authorities have conducted campaign for confiscation of guns from buffer zone communes, however, the guns continue to be used for hunting in the area. It is very difficult for enforcement people to control the guns because the hunters usually hide their guns in forests.	1
3. Forest clearance for agriculture cultivation	Local ethnic groups (Thai, Muong, and H'Mong people) has a long tradition of shifting cultivation. At present, this practice is still commonly used due to various reasons such as slope land, limited land area for cultivation, lack of irrigation system, disadvantage cultivation technology that lead to rapid soil erosion and fertile degradation. During recent year, market demand for corn seeds is increased encouraging local people clear NR forest for more cultivated land.	2
4. Over-harvesting NTFPs	Local residents have long tradition of harvesting and use of many kinds of NTFPs. Bamboos for house making and for sale, young bamboo shoots and various vegetables are for local use and for sale. Commercial harvest of young bamboo shoots is more dangerous to NR now.	4

5. Forest fire	The reasons of forest fires are annual field burning or use of fire in forest by hunters, bee honey collectors, etc. and also very hot and dry western wind (Lao wind). NR has no facilities/equipment of effective control of forest fire. In 2005, 106.6 ha was burned, 2006-2007: no large fires.	5
6. Free-ranging cattle raising	Buffaloes, cows and goats are left free in NR's forest, and will be taken back to villages when the hosts need them for working or for sale. Local authorities still have no cattle raising ground and no regulations for management of cattle raising.	6
7. Infrastructure development inside NRs (roads, irrigation works, etc.)	Villages, communes and districts sharing territory with NRs and in NR buffer zones always have high demand for development of infrastructure (roads, irrigation, hydropower works, etc.). A large road (3.5 m large) for border control is being constructed along international Vietnam-Lao border. Another large road (3.0 – 3.5m) running across NR from National road no.6 (Van Ho) to Vietnam-Lao border is also being constructed.	7

ANNEX 8. CONSERVATION NEED ASSESSMENT OF HANG KIA – PA CO NATURE RESERVE

I. GENERAL INFORMATION

Assessment team:

Management Board of Hang Kia – Pa Co NR: Nguyen Manh Dan (Director), Vu Quoc Hung (Deputy-Director), Tran Manh Cuong (Technical officer)

Consultants: Nguyen Xuan Dang, Dang Ngoc Can, Ngo Xuan Tuong, Le Tran Chan

Date: 10 May 2008

Name of protected area	Hang Kia – Pa Co Nature Reserve	
Location of protected area	Coordinate: 20 ⁰ 40' 30'' - 20 ⁰ 45' 30' N; 105 ⁰ 51' 20'' - 105 ⁰ 00' 35''E In territory of Mai Chau District, Hoa Binh Province	
Date of establishment	- NR was Gazetted by Decision 194/CP, dated 19 August 1986 of Chairman Ministers Council (now, Prime Minister) - Management board was establishment by Decision 453/QĐUB, dated 23 May 2000 of Chairman of Hoa Binh Provincial People Committee	
Ownership details	Management Board of Hang Kia – Pa Co NR	
Management Authority	Forest Protection Department of Hoa Binh Province	
Size of protected area (ha)	7,091ha (Strict Protection Zone: 2,680.8ha, Ecological Restoration Zone: 4,410.2ha)	
Designations (IUCN category)	Nature Reserve. IUCN Category Ib (Wilderness Area).	
Brief details of government projects in protected areas	National Programme 661	
List of top two protected area objectives		
Objective 1	Protection of forest ecosystems of Northwest Vietnam and North Truong Son Range in particular, Conservation gene pool	
Objective 2	Protection of natural environment	
Objective 3	Support socioeconomic development of mountainous communes	

II. ASSESSMENT OF MANAGEMENT CAPACITY (Quadrant with **bold letters** is selected one as best reflects situation of assessed NR)

Issue	Criteria	Score	Comments
1. Legal status Does the park have legal status?	The protected area is not gazetted	0	<ul style="list-style-type: none"> NR was Gazetted by Decision 194/CP, dated 19 August 1986 of Chairman Ministers Council (now, Prime Minister) Management board was establishment by Decision 453/QĐUB, dated 23 May 2000 of Chairman of Hoa Binh Provincial People Committee
	The government has agreed that the protected area should be gazetted but has done nothing about it as yet	1	
	The protected area is in the process of being gazetted but the process is still incomplete	2	
	The protected area has been legally gazetted (or in the case of private reserves is owned by a trust or similar)	3	
2. Protected area regulations Are inappropriate land uses and activities (e.g. poaching) controlled? <i>Context</i>	Mechanisms for controlling inappropriate land use and activities in the protected area are not in place	0	<ul style="list-style-type: none"> Staff members lack of conservation experience Lack of equipment for conservation activities There is a numbers of villages and agriculture lands inside NR In 2006-2007, Management Board in collaboration with local authorities revised the boundary to exclude villages and agriculture land from NR boundary Forest clearance for agriculture land and harvest of NTFPs is severe
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are major problems in implementing them effectively	1	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are some problems in effectively implementing them	2	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist and are being effectively implemented	3	
3. Law enforcement Can staff enforce protected area rules well enough? <i>Context</i>	The staff have no effective capacity to enforce protected area legislation and regulations	0	<ul style="list-style-type: none"> Management Board of Hang Kia – Pa Co NR has 13 staff members (2 graduated university, 10 graduated forestry vocational school. Staff members lack of conservation knowledge and skill Governmental support to livelihood of local
	There are major deficiencies in staff capacity to enforce protected area legislation and regulations (e.g. lack of skills, low patrol capacity)	1	
	The staff have acceptable capacity to enforce protected area legislation and regulations but some deficiencies remain	2	

Issue	Criteria	Score	Comments
	The staff have excellent capacity to enforce protected area legislation and regulations	3	communities is limited
4. Protected area objectives	No firm objectives have been agreed for the protected area	0	Management objectives of NR were clear and agreed by stakeholders: local authorities, related agencies/organizations. All villages know the management objectives of NR
Have objectives been agreed? <i>Planning</i>	There are some objectives, but these are out-dated and bear little resemblance to the way that the site is managed	1	
	There are clear objectives for the establishment and management of the protected area, but these were set by a few professionals	2	
	The protected area has clear objectives agreed by a wide range of stakeholders	3	
5. Protected area boundary design	Inadequacies in boundary design mean that achievement of major objectives of the protected area is impossible	0	<ul style="list-style-type: none"> Boundary design is suitable for biodiversity conservation. There are some villages situated inside NR however, management objectives can be achieved
Does the protected area need enlarging, corridors etc to meet its objectives? <i>Planning</i>	Inadequacies in boundary design mean that achievement of major objectives of the protected area are constrained to some extent	1	
	Boundary design is not constraining achievement of major objectives of the protected area	2	
	Reserve design features are significantly aiding achievement of major objectives of the protected area	3	
6. Protected area boundary	The boundary of the protected area is not known by the management authority or local residents	0	Local people clearly know the reserve boundary

Issue	Criteria	Score	Comments
	The boundary of the protected area is known by the management authority but is not known by local residents	1	
	The boundary of the protected area is known by both the management authority and local residents but is not fully demarcated	2	
	The boundary of the protected area is known by the management authority and local residents and is fully demarcated	3	
7. Management plan	There is no management plan for the protected area	0	First Investment plan was and approved in 1994 and revised investment plan for 2005-2010 was approved in 2004 in by People Committee of Hoa Binh Province, however, implementation of conservation activities and researches is limited due lack of budget and skill
Is there a management plan and is it being implemented? <i>Planning</i>	A management plan is being prepared or has been prepared but is not being implemented	1	
	An approved management plan exists but it is only being partially implemented because of funding constraints or other problems	2	
	An approved management plan exists and is being implemented	3	
8. Annual work plan	No annual work plan exists	0	NR Management board develops annual work plan based on limited available budget and but focusing on law enforcement not yet conservation activities.
Is there an annual work plan? <i>Planning/Outputs</i>	An annual work plan and actions but activities are not monitored against this	1	
	An annual work plan exists and actions are monitored against this, but many activities are not completed	2	
	An annual work plan exists, and actions are monitored against this and most or all prescribed activities are completed	3	
9. Resource inventory	There is little or no information available on the critical habitats, species and cultural values of the protected area	0	<ul style="list-style-type: none"> The first biodiversity assessment was conducted in 1994 and some other studies were conducted. There is limited information on population station of key species not enough to develop
Do you have enough information to	Information on the critical habitats, species and cultural values of the protected area is not sufficient to support planning and decision making	1	

Issue	Criteria	Score	Comments
manage the area? <i>Context</i>	Information on the critical habitats, species and cultural values of the protected area is sufficient for key areas of planning/decision making but the necessary survey work is not being maintained	2	monitoring programme
	Information concerning on the critical habitats, species and cultural values of the protected area is sufficient to support planning and decision making and is being maintained	3	
10. Research Is there a programme of management-orientated survey and research work? <i>Inputs</i>	There is no survey of research work	0	There is some baseline biodiversity surveys conducted by scientific institutes but Management board could not access to the research results
	There is some ad hoc survey and research work	1	
	There is considerable survey and research work but no overall programme	2	
	There is a comprehensive, integrated programme of survey and research work	3	
11. Resource management Is the protected area adequately managed (e.g. for fire, invasive species, poaching)? <i>Process</i>	Requirements for active management of critical ecosystems, species and cultural values have not been assessed	0	Important ecosystems and species of high conservation significance are known but no conservation action conducted due to lack of fund
	Requirements for active management of critical ecosystems, species and cultural values are known but are not being addressed	1	
	Requirements for active management of critical ecosystems, species and cultural values are only being partially addressed	2	
	Requirements for active management of critical ecosystems, species and cultural values are being substantially or fully addressed	3	

Issue	Criteria	Score	Comments
12. Staff numbers Are there enough people employed to manage the protected area? <i>Inputs</i>	There are no staff	0	<ul style="list-style-type: none"> Management Board has 13 staff members, enough in allowable number, however, most of staff members lack of conservation experience and knowledge
	Staff numbers are so inadequate that they seriously hamper site management	1	
	Staff numbers are below optimum level	2	
	Staff numbers, are in tune with the management needs of the site	3	
13. Staff training Is there enough training for staff? <i>Inputs/Process</i>	Staff are untrained	0	<ul style="list-style-type: none"> Some staff members of NR Management Board have received training on biodiversity research and monitoring, however, more training is necessary.
	Staff training and skills are inadequate for the needs of the protected area	1	
	Staff training and skills are acceptable, but could be further improved to fully achieve the goals/objectives of management	2	
	Staff training and skills are perfectly in tune with the management needs of the site	3	
14. Current budget Is the current budget sufficient? <i>Inputs</i>	There is no budget for the protected area	0	Annual budget comes from 2 sources: <ul style="list-style-type: none"> Provincial budget (Hoa Binh) which will generally pay for salary of staff members and NR protection activities (about 31 million VND per year) National Programme 661 to pay for contracting local communities to protect forest and forest fire prevention activities (2007: 30 million VND, 2008: 30 millions VND).
	The available budget is inadequate and presents a serious constraint to the capacity to manage	1	
	The available budget is acceptable, but could be further improved to fully achieve effective management	2	
	The available budget is sufficient and meets the management needs of the site	3	
15. Security of budget	There is no secure budget for the protected area and management is wholly reliant on outside funding	0	<ul style="list-style-type: none"> Budget portion from Provincial administration budget is secure but not

Issue	Criteria	Score	Comments
Is the budget secure? <i>Inputs</i>	There is very little secure budget and the protected area could not function adequately without outside funding	1	enough to implement all activities in Investment Plan, especially conservation and research
	There is a reasonably secure core budget for the protected area but many innovations and initiatives are reliant on outside funding	2	
	There is a secure budget for the protected area and its management needs	3	
16. Management of budget Is the budget managed well enough? <i>Process</i>	Budget management is very bad and significantly undermines effectiveness	0	Accountant need better training on budget management
	Budget management is poor and constrains effectiveness	1	
	Budget management is adequate but could be improved	2	
	Budget management is excellent and aids effectiveness	3	
17. Maintenance Is equipment adequately maintained? <i>Process</i>	No maintenance of equipment/facilities is undertaken	0	Management board has 1 car (Uaz), 2 computers, 1 GPS, 1 digital camera. All have regular maintenance
	Maintenance is undertaken only on an ad hoc or emergency basis	1	
	Most equipment/facilities are regularly maintained	2	
	All equipment/facilities are regularly maintained	3	
18. Personnel management Are the staff managed well enough? <i>Process</i>	Problems with personnel management significantly constrain management effectiveness	0	<ul style="list-style-type: none"> Management Board divided into 3 divisions: accountancy (2), Technical (1), Legislation (1), the rest are rangers working in guard stations. Some members need more training
	Problems with personnel management partially constrain management effectiveness	1	
	Personnel management is adequate but could be improved	2	
	Personnel management is excellent and aids effectiveness	3	
19. Communication and outreach	There is little or no communication between managers and stakeholders involved in the protected area	0	<ul style="list-style-type: none"> There is monthly meeting with local

Issue	Criteria	Score	Comments
Is there a planned communication and outreach programme? <i>Process</i>	There is communication between managers and stakeholders but this is ad hoc and not part of a planned communication programme	1	<ul style="list-style-type: none"> authorities and district rangers for information exchange and cooperation. Forest rangers keep close contact with villages. Difficult terrain and existence of villages inside NR make it difficult to control violation activities
	There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders but implementation is limited	2	
	There is a planned communication programme that is being used to build support for the protected area amongst relevant stakeholders	3	
20. State and commercial neighbours Is there cooperation with adjacent land users? <i>Process</i>	There is no contact between managers and neighboring official or corporate land users	0	<ul style="list-style-type: none"> There is collaboration with local authorities, border army and related agencies, however, the collaboration is still limited
	There is limited contact between managers and neighboring official or corporate land users	1	
	There is regular contact between managers and neighboring official or corporate land users, but only limited co-operation	2	
	There is regular contact between managers and neighbouring official or corporate land users, and substantial cooperation on management	3	
21. Indigenous people Do indigenous and traditional peoples resident or regularly using the PA have input to management decisions? <i>Process</i>	Indigenous and traditional peoples have no input into decisions relating to its management	0	<p>Indigenous people include H'Mong (60%), Dao (5%), Muong (20%) and Thai (20%). Indigenous and traditional peoples are not involved into making management decision however, before application of any management decision Management board has a meeting with them for agreement.</p>
	Indigenous and traditional peoples have some input into discussions relating to its management but no direct involvement in decisions	1	
	<ul style="list-style-type: none"> Indigenous and traditional peoples directly contribute to some decisions relating to its management 	2	
	Indigenous and traditional peoples directly contribute to all decisions relating to its management	3	

Issue	Criteria	Score	Comments
22. Local communities Do local communities resident or near the protected area have input to management decisions? <i>Process</i>	Local communities have no input into decisions relating to its management	0	Local communities are consulted but not directly involved in making management decisions
	Local communities have some input into discussions relating to its management but no direct involvement in the resulting decisions	1	
	Local communities directly contribute to some decisions relating to its management	2	
	Local communities directly contribute to most decisions relating to its management	3	
23. Visitor facilities Are visitor facilities (for tourists, pilgrims etc) good enough? <i>Outputs</i>	There are no visitor facilities and services	0	<ul style="list-style-type: none"> The NR has good potential for tourism development but no facilities are developed Some tourists come to NR under tour of Hoa Binh Tourism without collaboration with NR management board. Province plan to make a tourism trail in NR. Tourists do not cause problem to NR management now.
	Visitor facilities and services are inadequate for current levels of visitation	1	
	Visitor facilities and services are adequate for current levels of visitation	2	
	Visitor facilities and services are excellent for current levels of visitation	3	
24. Commercial tourism Do commercial tour operators contribute to protected area management? <i>Process</i>	There is little or no contact between managers and tourism operators using the protected area	0	No liaise between NR management board and Tourism company
	There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters	1	
	There is limited co-operation between managers and tourism operators to enhance visitor experiences and protect park values	2	
	There is excellent co-operation between managers and tourism operators to enhance visitor experiences and protect park values	3	
25. Tourism fees	There is no fee for visiting the protected area	0	

Issue	Criteria	Score	Comments
Does the protected area charge fees for tourists? <i>Outputs</i>	There is a fee for visiting the protected area, but it goes straight to central government and is not returned to the park or its environs	1	
	There is a fee for visiting the protected area, that ends up with the local authority	2	
	There is a fee for visiting the protected area that helps to support this or other protected areas	3	
26. Condition assessment Is the protected area being managed consistent to its objectives? <i>Outcomes</i>	Many of the most important biodiversity, ecological and cultural values are being severely degraded	0	<ul style="list-style-type: none"> Lack of adequate information on NR biodiversity. There is no monitoring and evaluation system.
	Some of the most important biodiversity, ecological and cultural values are being severely degraded	1	
	Some biodiversity, ecological and cultural values are being partially degraded but the most important values have not been significantly impacted	2	
	Biodiversity, ecological and cultural values are predominantly intact	3	
27. Access assessment Are the available management mechanisms working to control access or use? <i>Outcomes</i>	Protection systems (patrols, permits etc) are ineffective in controlling access or use of the reserve in accordance with designated objectives	0	<p>Hang Kia – Pa Co NR has headquarter offices and 2 guard station firmly constructed. One station has telephone communication, another can be assessed by mobile phone, however, headquarter office still has neither telephone nor mobile communication. Office equipment and equipment for enforcement, forest patrolling and biodiversity monitoring is very poor.</p>
	Protection systems are only partially effective in controlling access or use of the reserve in accordance with designated objectives	1	
	Protection systems are moderately effective in controlling access or use of the reserve in accordance with designated objectives	2	
	Protection systems are largely or wholly effective in controlling access or use of the reserve in accordance with designated objectives	3	
28. Economic benefit assessment	There is little or no flow of economic benefits to local communities from the existence of the protected area	0	<ul style="list-style-type: none"> Contracting forest for protection and for

Issue	Criteria	Score	Comments
Is the protected area providing economic assessments to local communities? <i>Outcomes</i>	There is some flow of economic benefits to local communities from the existence of the protected area but this is of minor significance to the regional economy.	1	natural generation brings some economic benefit to local communities though still limited. Now, 120 households contracted for 300 ha forest.
	There is a flow of economic benefits to local communities from the existence of the protected area and this is of moderate or greater significance to the regional economy but most of this benefit accrues from activities outside the park boundary (e.g. spending by visitors getting to the park).	2	
	There is a major flow of economic benefits to local communities from the existence of the protected area and a significant proportion of this derives from activities on the park (e.g. employment of locals, locally operated commercial tours etc).	3	
29. Monitoring and evaluation <i>Planning/Process</i>	There is no attempt at monitoring and evaluation in the protected area	0	<ul style="list-style-type: none"> • There is some ad hoc monitoring and evaluation, but no overall • NR staff members have no experience development of monitoring system Lacks of equipment for monitoring and evaluation
	There is some ad hoc monitoring and evaluation, but no overall strategy and/or no regular collection of results	1	
	There is an agreed and implemented monitoring and evaluation system but results are not systematically used for management	2	
	A comprehensive monitoring and evaluation exists, is well implemented and used in adaptive management	3	
TOTAL SCORE (MAXIMUM POSSIBLE SCORE 91):		49/91	

III. THREATS ASSESSMENT

Direct threat	Description	Ranking
1. Illegal timber extraction	Illegal timber extraction from NR is made by local residents and occurs all around year, but with small scale, mainly selected cutting of some valuable timber species such as <i>Parashorea chinensis</i> , <i>Manglietia fordiana</i> , <i>Michelia spp.</i> , <i>Chukrasia tabularis</i> , <i>Fokenia sp.</i> , etc. Local residents cut timbers for local use (house construction, making instruments), not for sale. Most of forests of NR is limestone forests which have been undergone selected logging with low number of tall trees remained. Further timber extraction can lead to destruction of forest structure and reduction of habitat quality of many animal species.	1
2. Hunting and Trapping wildlife	Hunting and trapping wildlife in NR is taken mainly by local residents. This is a long tradition of local ethnic communities. Wild animals are hunted by guns, hunting dogs, bows and many kind of traps. Management board in collaboration with local authorities have conducted campaign for confiscation of guns from local communes, however, the guns continue to be used for hunting in the area. It is very difficult for enforcement people to control the guns because the hunters usually hide their guns in forests. Local people know that wildlife hunting is illegal and prohibited by NR rangers, however, they keep hunting for food and for sale.	2
3. Forest clearance for agriculture cultivation	Due to many villages situated inside NR, forests in valley and lower slope have been cleared for agriculture cultivation (rice, corn, plum, peach, etc.) . At present, forest clearance for agriculture land is rarely happened	4
4. Over-harvesting NTFPs	Local residents have long tradition of harvesting and use of many kinds of NTFPs: medicine plants, mushroom, honey, etc. They collect NTFPs mainly for local use, rarely for sale (medicine plants, etc.). Collecting fuelwood is problem because of widespreading, and daily basic. About 80% of demand for fuel in the area are from fuelwood collected from NR.	3
5. Forest fire	The reasons of forest fires are annual field burning or use of fire in forest by hunters, bee honey collectors, etc. . NR has no facilities/equipment of effective control of forest fire, however, during recent years large fires not happened in NR.	5
6. Free-ranging cattle raising	Local people raise buffaloes, cows, etc. Although, all villages have separate cattle grounds, people continue to keep cattle free in NR for better forage sources.	6

7. Infrastructure development inside NRs (roads, irrigation works, etc.)	<p>In Hang Kia-Pa Co NR, there are several villages situated inside including centres of Pa Co and Hang Kia Communes. At present, large inter-communal roads (2-3 m wide) were constructed and inter-village roads are being developed. Road development causes habitat loss and easier access to forests for illegal hunting, timber logging and NTFPs collection.</p>	7
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Annex 9. Form of Questionnaire for households survey in buffer zone communes

(On livelihood, forest product exploitation/use, awareness on biodiversity

conservation and impacts of TSHP)

HOUSEHOLD SURVEY QUESTIONNAIRE

Village : _____ **Commune :** _____

District : _____ **Province** _____

I. General information

Name of household host: _____ 5 male 5 female Age _____ Ethnic group _____

Education _____ Vietnamese speaking ability: _____

Occupation _____ Number of people in households _____

Wife/ husband: age _____ education _____ Ethnic group _____

Economic status (self evaluation): 5 Rich 5 Fair 5 Middle 5 Poor 5 Very poor

5 wooden house on stilts 5 wooden house 5 brick house 5 soil house 5 bamboo house

Migration from other area? 5 Years living in this village: _____ Original _____

II. Agriculture production

Items	Area (ha)
Total agriculture land of household, including	
- Paddy rice land	
- Upland fields	
- Crop land	
- House garden land	
- Forest garden land	
- Pond, lake	

- Has your household receive land certificate?: yes5 no 5 Which year received ? : _____
- How many ha of production land your household has in Nature Reserve? _____
- Does your household have enough land for agriculture production? yes5 no5
- If no, which kind of land lacks? paddy rice5 , upland field5 , forest garden5 , other5
- Did your household clear forest for new agriculture land during 5 recent years? yes5 no5
 If yes, where? Outside Nature Reserve5 Outside Nature Reserve5
- What Government should support your household to increase your household economic status? More land 5 , Fund 5 , Technology 5 , Stock plant and stock domestic animal 5

Others (specify):

- Does your household lack of rice? yes⁵ no⁵
- If yes, how long for each time of lack?
 Every year⁵ 2 years/time⁵ 3 year/time⁵ Rarely⁵
- In the year when your household lacks of rice, how many months do you lack for?_____
- What does your household do when lack of rice?
 Borrow from others ⁵ Sell cattle/poultry ⁵ Eating corn, manioc instead ⁵
 Cutting timber for sale ⁵ Harvesting other forest products for sale⁵

Others (specify):

III. Cattle raising

- Which cattle does your household raise?

Cattle	No. of indiv.	Aim of raising				
		For working	For transport	For sale	For household consumption	For stock raising
Buffalo						
Cow						
Horse						
Pig						
Goat						
other						

- Does your household keep free-ranging cattle? : yes⁵ no⁵ .
- How many months does your household keeps free-ranging?
 Month (by lunar calendar):_____ Month (Solar calendar):_____
- Total number of months per year:_____
- Does your household keep free-ranging cattle inside Nature Reserve ? yes⁵ no⁵ .
- Does your household have cattle keeper?. If yes, which months the cattle are taken by the keeper? Months by lunar calendar:_____ by solar calendar _____
- Total of months by keeper:_____
- Does your household have private cattle-raising ground? yes ⁵ no ⁵
 If yes, how large the ground?_____
- Is there communal cattle raising ground ? ⁵ yes ⁵ no.
 If yes, how large the ground?_____

Knowledge about Nature Reserve

- Which kind of forest occurs in your commune/village?

	Yes	No	What is the name of the Nature Reserve ?		
Nature reserve	5	5	5 Xuan nha	5 Pu hu	5 Hang Kia Pa Ko
Production forest	5	5	5 other name	5 not know	
Protection forest	5	5			
Communal forest	5	5			
Village forest	5	5			
Other	5	5			

- Do all members of your household know where is the NR boundary? 5 yes 5 no
- Who do you know to manage following forest land?

Forest land	Govern-ment	Commune People committee	Forest rangers	Local residents	No body	Not know
Nature Reserve						
Production forest						
Protection forest						
Commune's forest						

- Which activities listed bellow are permitted ?

Forest land	Harve- sting fuelwood	Harve- sting medicine plants	Collecting young bamboo shoot, mush- room, honey	Hunting, trapping wildlife	Tourism visit	Timber logging	Other (specify)	Not know
Nature Reserve								
Production forest								
Protection forest								
Commune's forest								

There are different opinion about Nature Reserve. Do you agree/not agree with following opinion?

Nature Reserve is very important because it protect wild animals and plants

Agree 5

Not agree 5

Nature Reserve just makes local people poor because the people are not allowed to use the forest products

	Agree5	Not agree 5
Nature Reserve is very important because it protect water sources and prevent soil erosion		
	Agree5	Not agree 5
Nature Reserve just wastes the land while local people need land for agriculture production		
	Agree5	Not agree 5
Forest rangers can not protect forests, the forest should be allocated to local people for better management		
	Agree5	Not agree 5
People lives and/ conduct agriculture production inside Nature Reserve is reasonable		
	Agree5	Not agree 5

V. Impacts of Trung Son HPP

Do you know that a hydropower station will be constructed soon on Ma River of Trung Son Commune, Quan Hoa District, Thanh Hoa Province? No5 Yes 5

If yes, how do you know? Commune authority informed5 , By radio5 , By Newspaper5 , By TV5 , Heard from someone5

- How do you think, Trung Son HPP will affect livelihood of local communities:
 - 5 Good. Why?:
 - 5 Not good. Why?:
- How do you think, a hydropower station should be constructed in this area? yes5 no5
- What do you suggest the Government should do to stabilize livelihood of your household and others?

Date_____month_____2008

Surveyor
(sign and full name)

Reported household host
(Sign and full name)

Annex 10. A list of surveyed households in buffer zones of Pu Hu and Xuan Nha NR

No.	Name of household host	Ethnic	Address
I. Pu Hu NR (Thanh Hoa)			
1	Phạm Bá Nụng	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
2	Phạm Hùng Nhân	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
3	Phạm Bá Đài	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
4	Lò Khăm Thanh	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
5	Vi Văn Phú	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
6	Lương Thị Hèn	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
7	Ngân Văn Khường	Mường	Trung Son Commune, Quan Hoa, Thanh Hoa
8	Đình Công Định	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
9	Hà Văn Sựu	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
10	Hà Văn Pháp	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
11	Lò Văn Toàn	Mường	Trung Son Commune, Quan Hoa, Thanh Hoa
12	Phạm Hùng Mươi	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
13	Ngân Văn Hẹn	Mường	Trung Son Commune, Quan Hoa, Thanh Hoa
14	Phạm Minh Thoa	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
15	Phạm Bá Thiên	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
16	Sùng A Di	H'Mông	Trung Son Commune, Quan Hoa, Thanh Hoa
17	Phạm Bá Lằm	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
18	Lương Ái Giáp	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
19	Vi Văn Tấn	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
20	Phạm Bá Ôn	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
21	Phạm Ngọc Ân	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
22	Phạm Minh Thiện	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
23	Lương Thanh Xuân	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
24	Vi Thành Thoa	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
25	Phạm Bá Hoàng	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
26	Lò Khăm Thánh	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
27	Phạm Thạch Sanh	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
28	Hà Văn Thẩm	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
29	Lương Văn Quỳnh	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
30	Lương Thành Đô	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
31	Phạm Minh Thắng	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
32	Lương Xuân Mới	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
33	Phạm Bá Tuế	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
34	Lương Ngọc Thuần	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
35	Lương Thị Hùng	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa
36	Lương Ngọc Tuấn	Thái	Trung Son Commune, Quan Hoa, Thanh Hoa

37	Vi Văn Tác	Thái	Trung Sơn Commune, Quan Hoa, Thanh Hoa
38	Phạm Mạnh Hưng	Thái	Trung Sơn Commune, Quan Hoa, Thanh Hoa
39	Lò Văn Nùng	Thái	Trung Sơn Commune, Quan Hoa, Thanh Hoa
40	Vi Văn Thuyên	Thái	Trung Sơn Commune, Quan Hoa, Thanh Hoa
41	Hà Văn Bảo	Thái	Trung Sơn Commune, Quan Hoa, Thanh Hoa
42	Hà Công Liêm	Thái	Trung Sơn Commune, Quan Hoa, Thanh Hoa
43	Hà Văn Bình	Thái	Trung Ly Commune, Muong La, Thanh Hoa
44	Đinh Thị Khuỷa	Thái	Trung Ly Commune, Muong La, Thanh Hoa
45	Sùng A Đỏ	H'Mông	Trung Ly Commune, Muong La, Thanh Hoa
46	Sùng A Dơ	H'Mông	Trung Ly Commune, Muong La, Thanh Hoa
47	Thào A Tính	H'Mông	Trung Ly Commune, Muong La, Thanh Hoa
48	Vàng A Sự	H'Mông	Trung Ly Commune, Muong La, Thanh Hoa
49	Thào A Sự	H'Mông	Trung Ly Commune, Muong La, Thanh Hoa
50	Thào A Lự	H'Mông	Trung Ly Commune, Muong La, Thanh Hoa
51	Lương Văn Hoàng	Thái	Trung Ly Commune, Muong La, Thanh Hoa
52	Lương Văn Dương	Thái	Trung Ly Commune, Muong La, Thanh Hoa
53	Len Văn Minh	Thái	Trung Ly Commune, Muong La, Thanh Hoa
54	Phạm Văn Tú	Thái	Trung Ly Commune, Muong La, Thanh Hoa
55	Lương Văn Nhượng	Thái	Trung Ly Commune, Muong La, Thanh Hoa
56	Vi Văn Đường	Thái	Trung Ly Commune, Muong La, Thanh Hoa
57	Vi Văn Đại	Thái	Trung Ly Commune, Muong La, Thanh Hoa
58	Hà Văn Liên	Thái	Trung Ly Commune, Muong La, Thanh Hoa
59	Vi Văn Thiện	Thái	Trung Ly Commune, Muong La, Thanh Hoa
60	Hà Văn Đăng	Thái	Trung Ly Commune, Muong La, Thanh Hoa
61	Vi Văn Giành	Thái	Trung Ly Commune, Muong La, Thanh Hoa
62	Lương Văn Ôn	Thái	Trung Ly Commune, Muong La, Thanh Hoa
63	Lương Văn Quang	Thái	Trung Ly Commune, Muong La, Thanh Hoa
64	Lương Ngọc Quyển	Thái	Trung Ly Commune, Muong La, Thanh Hoa
65	Hà Thị Tính	Thái	Trung Ly Commune, Muong La, Thanh Hoa
66	Vi Văn Thiện	Thái	Trung Ly Commune, Muong La, Thanh Hoa
67	Ngân Văn Cảnh	Thái	Trung Ly Commune, Muong La, Thanh Hoa
68	Đinh Công Đề	Thái	Trung Ly Commune, Muong La, Thanh Hoa
69	Lương Thị Viết	Thái	Trung Ly Commune, Muong La, Thanh Hoa
70	Lương Thị Phòi	Thái	Trung Ly Commune, Muong La, Thanh Hoa
71	Lò Văn Thâm	Thái	Trung Ly Commune, Muong La, Thanh Hoa
72	Đinh Công Diễm	Thái	Trung Ly Commune, Muong La, Thanh Hoa
73	Lò Thị Phượng	Thái	Trung Ly Commune, Muong La, Thanh Hoa
74	Đinh Thị Lĩnh	Thái	Trung Ly Commune, Muong La, Thanh Hoa
75	Đinh Thị Lạm	Thái	Trung Ly Commune, Muong La, Thanh Hoa

76	Đình Công Điện	Thái	Trung Ly Commune, Muong La, Thanh Hoa
77	Đình Thị Thơ	Thái	Trung Ly Commune, Muong La, Thanh Hoa
78	Đình Công Đạt	Thái	Trung Ly Commune, Muong La, Thanh Hoa
79	Đình Thị Xùm	Thái	Trung Ly Commune, Muong La, Thanh Hoa
80	Đình Công Đầm	Thái	Trung Ly Commune, Muong La, Thanh Hoa
81	Đình Thị Sùng	Thái	Trung Ly Commune, Muong La, Thanh Hoa
82	Đình Công Đình	Thái	Trung Ly Commune, Muong La, Thanh Hoa
83	Lương Thị Pén	Thái	Trung Ly Commune, Muong La, Thanh Hoa
84	Đình Công Khoa	Thái	Trung Ly Commune, Muong La, Thanh Hoa
85	Đình Thị Khút	Thái	Trung Ly Commune, Muong La, Thanh Hoa
86	Đình Công Thoà	Thái	Trung Ly Commune, Muong La, Thanh Hoa
87	Ngân Thị Lâm	Thái	Trung Ly Commune, Muong La, Thanh Hoa
88	Đình Công Thày	Thái	Trung Ly Commune, Muong La, Thanh Hoa
89	Hà Thị Chiềng	Thái	Trung Ly Commune, Muong La, Thanh Hoa
90	Đình Công Quyết	Thái	Trung Ly Commune, Muong La, Thanh Hoa
91	Hà Thị Ổn	Thái	Trung Ly Commune, Muong La, Thanh Hoa
92	Lương Văn Thuyết	Thái	Trung Ly Commune, Muong La, Thanh Hoa
93	Lò Thị Nhờ	Thái	Trung Ly Commune, Muong La, Thanh Hoa
94	Đình Công Điều	Thái	Trung Ly Commune, Muong La, Thanh Hoa
95	Hà Thị Mút	Thái	Trung Ly Commune, Muong La, Thanh Hoa
II. Xuan Nha NR (Son La)			
1	Mùi Văn Thoán	Mường	Tan Xuan Commune, Moc Chau, Son La
2	Hà Văn Tý	Thái	Tan Xuan Commune, Moc Chau, Son La
3	Đình Văn Thiều	Mường	Tan Xuan Commune, Moc Chau, Son La
4	Lò Văn Ngợi	Mường	Tan Xuan Commune, Moc Chau, Son La
5	Hà Văn Dương	Thái	Tan Xuan Commune, Moc Chau, Son La
6	Lò Văn Hưng	Mường	Tan Xuan Commune, Moc Chau, Son La
7	Đình Xuân	Mường	Tan Xuan Commune, Moc Chau, Son La
8	Lò Văn Xi	Mường	Tan Xuan Commune, Moc Chau, Son La
9	Hà Văn Hoàn	Thái	Tan Xuan Commune, Moc Chau, Son La
10	Lò Điệp	Thái	Tan Xuan Commune, Moc Chau, Son La
11	Hà Đức Dung	Thái	Tan Xuan Commune, Moc Chau, Son La
12	Đình Văn Thuyền	Mường	Tan Xuan Commune, Moc Chau, Son La
13	Đình Thị Piềng	Mường	Tan Xuan Commune, Moc Chau, Son La
14	Hà Văn Thun	Thái	Tan Xuan Commune, Moc Chau, Son La
15	Hà Thị Vọng	Thái	Tan Xuan Commune, Moc Chau, Son La
16	Đình Thị Chính	Thái	Tan Xuan Commune, Moc Chau, Son La
17	Hà Văn Viễn	Thái	Tan Xuan Commune, Moc Chau, Son La
18	Hà Minh Truyền	Thái	Tan Xuan Commune, Moc Chau, Son La

19	Hà Văn Tựu	Thái	Tan Xuan Commune, Moc Chau, Son La
20	Đinh Thị Nhung	Mường	Tan Xuan Commune, Moc Chau, Son La
21	Hà Văn Tuấn	Thái	Tan Xuan Commune, Moc Chau, Son La
22	Lò Thị Hiền	Mường	Tan Xuan Commune, Moc Chau, Son La
23	Mùi Văn Giới	Mường	Tan Xuan Commune, Moc Chau, Son La
24	Mùi Thị Xuyên	Mường	Tan Xuan Commune, Moc Chau, Son La
25	Mùi Văn Khiêm	Mường	Tan Xuan Commune, Moc Chau, Son La
26	Đinh Công Loan	Mường	Tan Xuan Commune, Moc Chau, Son La
27	Lò Thị Giang	Mường	Tan Xuan Commune, Moc Chau, Son La
28	Đinh Thị Sung	Mường	Tan Xuan Commune, Moc Chau, Son La
29	Đinh Thị Sáu	Mường	Tan Xuan Commune, Moc Chau, Son La
30	Hà Văn Thim	Thái	Tan Xuan Commune, Moc Chau, Son La
31	Hà Thị Vui	Thái	Tan Xuan Commune, Moc Chau, Son La
32	Đinh Thị Chénh	Thái	Tan Xuan Commune, Moc Chau, Son La
33	Hà Thị Bình	Thái	Tan Xuan Commune, Moc Chau, Son La
34	Đinh Công Cường	Mường	Tan Xuan Commune, Moc Chau, Son La
35	Đinh Thị Đón	Mường	Tan Xuan Commune, Moc Chau, Son La
36	Ngân Thị Thù	Mường	Tan Xuan Commune, Moc Chau, Son La
37	Đinh Công Duẩn	Mường	Tan Xuan Commune, Moc Chau, Son La
38	Đinh Công Tài	Mường	Tan Xuan Commune, Moc Chau, Son La
39	Vì Thị ả gọc	Thái	Tan Xuan Commune, Moc Chau, Son La
40	Hà Văn Phúc	Thái	Tan Xuan Commune, Moc Chau, Son La
41	Hà Văn Diệu	Thái	Tan Xuan Commune, Moc Chau, Son La
42	Đinh Công Diệu	Mường	Tan Xuan Commune, Moc Chau, Son La
43	Đinh Công Duyệt	Mường	Tan Xuan Commune, Moc Chau, Son La
44	Đinh Công Thịnh	Mường	Tan Xuan Commune, Moc Chau, Son La
45	Đinh Công Hậu	Mường	Tan Xuan Commune, Moc Chau, Son La
46	ả gần Thị Thoa	Mường	Tan Xuan Commune, Moc Chau, Son La
47	Hà Văn Thuỷ	Thái	Tan Xuan Commune, Moc Chau, Son La
48	Đinh Thị Hôn	Mường	Tan Xuan Commune, Moc Chau, Son La
49	Đinh Quốc Dính	Mường	Tan Xuan Commune, Moc Chau, Son La
50	Đinh Công ả hót	Mường	Tan Xuan Commune, Moc Chau, Son La
51	Lò Văn Thắng	Mường	Tan Xuan Commune, Moc Chau, Son La
52	ả gần Văn Ề	Mường	Tan Xuan Commune, Moc Chau, Son La
53	Hà Văn Hình	Thái	Tan Xuan Commune, Moc Chau, Son La
54	Đinh Công Lang	Mường	Tan Xuan Commune, Moc Chau, Son La
55	Đinh Công Phui	Mường	Tan Xuan Commune, Moc Chau, Son La
56	Đinh Công Ều	Mường	Tan Xuan Commune, Moc Chau, Son La
57	Hà Văn Quỳnh	Thái	Tan Xuan Commune, Moc Chau, Son La

58	Phạm Thị ả hài	Mường	Tan Xuan Commune, Moc Chau, Son La
59	Hà Thị ần	Thái	Tan Xuan Commune, Moc Chau, Son La
60	Hà Văn Hiến	Thái	Tan Xuan Commune, Moc Chau, Son La
61	Lò Văn Huyền	Mường	Tan Xuan Commune, Moc Chau, Son La
62	Đình Công Hợi	Mường	Tan Xuan Commune, Moc Chau, Son La
63	Hà Văn Toàn	Thái	Tan Xuan Commune, Moc Chau, Son La
64	Mùi Thị Chúc	Mường	Tan Xuan Commune, Moc Chau, Son La
65	Mùi Thị Châm	Mường	Tan Xuan Commune, Moc Chau, Son La
66	Mùi Văn Huấn	Mường	Xuan ả ha Commune, Moc Chau, Son La
67	Vi Văn Thẩm	Thái	Xuan ả ha Commune, Moc Chau, Son La
68	Đình Văn Khánh	Mường	Xuan ả ha Commune, Moc Chau, Son La
69	Mùi Văn Huyền	Mường	Xuan ả ha Commune, Moc Chau, Son La
70	Hà ả gọc Điệp	Thái	Xuan ả ha Commune, Moc Chau, Son La
71	Vi Thị Oi	Thái	Xuan ả ha Commune, Moc Chau, Son La
72	Vi Thị Chương	Thái	Xuan ả ha Commune, Moc Chau, Son La
73	ả gân Văn Dậu	Thái	Xuan ả ha Commune, Moc Chau, Son La
74	Hà Thị Hường	Thái	Xuan ả ha Commune, Moc Chau, Son La
75	Đình Công ả guyên	Thái	Xuan ả ha Commune, Moc Chau, Son La
76	Lương Xuân Mới	Thái	Xuan ả ha Commune, Moc Chau, Son La
77	Lương Thành Đô	Thái	Xuan ả ha Commune, Moc Chau, Son La
78	Lương Văn Quỳnh	Thái	Xuan ả ha Commune, Moc Chau, Son La
79	Lương Thị Hừng	Thái	Xuan ả ha Commune, Moc Chau, Son La
80	Hà Công Liêm	Thái	Xuan ả ha Commune, Moc Chau, Son La
81	Lương ả gọc Thuận	Thái	Xuan ả ha Commune, Moc Chau, Son La
82	Lương ả gọc Tuấn	Thái	Xuan ả ha Commune, Moc Chau, Son La
83	Phạm Bá Tuế	Thái	Xuan ả ha Commune, Moc Chau, Son La
84	Vi Thành Thoa	Thái	Xuan ả ha Commune, Moc Chau, Son La
85	Lương Minh Thạch	Thái	Xuan ả ha Commune, Moc Chau, Son La
86	Lò Văn Toàn	Mường	Xuan ả ha Commune, Moc Chau, Son La
87	Vi Văn Tái	Thái	Xuan ả ha Commune, Moc Chau, Son La
88	Lò Văn ả ừng	Mường	Xuan ả ha Commune, Moc Chau, Son La
89	Vi Văn Thuyên	Thái	Xuan ả ha Commune, Moc Chau, Son La
90	Hà Văn Bạo	Thái	Xuan ả ha Commune, Moc Chau, Son La

Annex 11
SUMMARY OF CONSULTATION WITH LOCAL AUTHORITIES
AND RELATED AGENCIES/ ORGANIZATIONS

1. Consultation with Forest Protection Department (FPD) of Thanh Hoa Province

Date: 21 April 2008

FPD of Thanh Hoa Province

Mr. Le The Long – Deputy Director

Mr. Le Thanh Ngoi – Deputy Director

Organization structure: FPD Thanh Hoa has about 300 official staff members (forest rangers) and 70 contracted members. About 80 forest rangers are working in 3 protected areas of Thanh Hoa Province. FPD structure consists of one director, 2 deputy-directors, Forest Protection Unit, Legislation Unit, Administration Unit, Mobile rangers team and district forest protection units

Summary opinion on management of Pu Hu NR and impacts of TSHPP: Pu Hu NR was established by Decision of Thanh Hoa Provincial People Committee (PC) and under management of Thanh Hoa PC. FPD Thanh Hoa is responsible for management of personnel and professional consultancy. FPD takes care of following activities:

- Forest fire prevention and stopping
- Update information of forest resources
- Protesting illegal trade of forest products
- Providing equipment for law enforcement (uniform, weapons)

Management Board of NR has its own stamp, budget, account number and can accept any investment projects from national and international donors. Main difficulties of NR management board are as following:

- Limitation of budget for running
- Staff members have no training on conservation knowledge

Main threats to NR are:

- Hunting and trapping wildlife
- Forest clearance for agriculture land by local communities

In regard to TSHPP, Mr. Long personally is not yet officially informed and FPD has no meeting/workshop to discuss on impacts of TSHPP on Pu Hu NR and Biodiversity in general. However, some negative impacts can be foreseen as following:

- Reservoir filling upto elevation of 160 m asl. will cause inundation of agriculture land of local communities leading to increase forest clearance for new agriculture land.
- Resettlement of a number of households in new localities close to NR will cause forest destruction and wildlife hunting and trapping there.

- Increase of water in rivers and stream will facilitate deeper access into NR for exploitation and transport of forest products
- Increase of water in rivers, streams may submerge some habitats of wildlife especially, loss of grassland leading to reduction of food source for ungulates, etc.
- Increase of water in rivers, streams may increase habitat fragmentation , disturbing normal movement of wildlife

In order to prevent and mitigate negative impacts of TSHPP on Pu Hu NR and Biodiversity, there are so many works to do, some works of priority are:

- Increase management capacity of NR Management board (additional training, providing equipment, securing budget allocation for activities, etc.)
- Baseline biodiversity assessment needs to conduct.
- To find the ways to reduce pressure of local people on NR biodiversity, there is a village situated inside NR, the villagers lack of land for agriculture production
- Support local people to increase their living standard to reduce their pressure on forest products.

FPD Thanh Hoa is seeking fund for:

- Application of GIS technology on forest resources monitoring
- Developing a video film on biodiversity of Pu Hu NR
- Developing a website for Pu Hu NR

Note: Some documents and maps of NR were provided for our reference.

2. Consultation with FPD of Hoa Binh Province

Date: 5 May 2008

FPD of Hoa Binh Province

Mr. Bui Van Tuong – Director

Mr. Nguyen Van Minh – Technical officer

Mrs. Bui Thi De – Staff member of Forest Protection Unit

Organization structure: The FPD has about 200 staff members, 34 of them are working in FPD head office. The organization structure consists of Director, Deputy director, Forest Protection unit, Legislation unit, Administration unit, Mobile rangers team and district forest protection units. In regard to Hang Kia – Pa Co NR, FPD manages its personnel and professional techniques of forest protection, forest fire prevention and stopping, updating information on forest resources. NR management board has its own stamp, budget, account number and can accept any investment projects from national and international donors, now, only National programme 661

Summary opinion on management of Hang Kia – Pa Co NR and impacts of TSHPP: Hang Kia – Pa Co NR has high biodiversity values. Especially, in this NR inhabits a endemic coniferous species – Paco pine (Note: this species is mistakenly described as endemic to Northwest Vietnam, however, the species was latter identified as *Pinus kwangtungensis*).

The most difficult issue for NR management is a number of villages situated just inside NR which cause much of disturbance for forest and high risk of forest fire. Three communes are completely encompassed inside NR boundary and 2 of them are communes of H'Mong Minority who has very strong tradition of shifting cultivation, wildlife hunting and harvest of forest products. The people face with lack of land for agriculture production, using disadvantaged cultivation technology made the lack of agriculture land more serious and the people always try to encroach NR forest for agriculture land. Capacity of Management board is weak due to limited budget and staff members not yet properly trained. Another problem is tourists begin to come to NR more and more while Management Board could not control the tourists visit.

TSHPP will not cause forest inundation or other direct forest loss for NR, however, will cause more difficulties for NR management due to potential increase of forest products harvest and wildlife hunting. Therefore, some investment may need to increase capacity of NR management board, so that they can protect NR effectively.

In order to ensure biodiversity conservation of the NR many measures should be conducted and following are some of higher priority:

- Measures to increase living standards of local communities, mitigating their dependence on forest products such as support them to make good land-use planning, provide them with enough land area for agro-forestry production, application of new technology, new stock animals and stock plants of high productivities, provide low credit loan for households, etc.
- More education to increase their awareness on biodiversity conservation, nature protection, better understanding and obey national legislations on nature protection and biodiversity conservation.
- Developing facilities for ecotourism development into NR, including specific ethnic culture, try to involve local people into appropriate tourism services for increase of their household income
- Training staff members of NR Management board on biodiversity conservation knowledge and skill, providing them with better equipment for patrol and for conservation activities.
- Call of national and international investment projects for NR to help them conduct all conservation activities and biodiversity monitoring.

Note: Some documents and maps of NR were provided for our reference.

3. Consultation with FPD of Son La Province

Date: 7 May 2008

FPD of SonLa Province:

Mr. Chu Viet Hao – Deputy Director

Mr. Nguyen Manh Hung – Technical officer

Organization structure: The FPD has about 330 staff members, 40 of them are working in FPD head office, 290 forest rangers working in the field. The organization structure consists of Director, Deputy director, Forest Protection unit, Legislation unit, Administration unit, Mobile rangers team and district forest protection units. In regard to Xuan Nha NR, FPD manages its personnel and professional techniques of forest protection, forest fire prevention and stopping, updating information on forest resources. NR management board has its own stamp, budget, account number and can accept any investment projects from national and international donors, now, only National programme 661

Summary opinions on management of Xuan Nha NR and impacts of TSHPP: Xuan Nha NR has very high biodiversity values. The most difficulty in NR management is existence of many villages inside NR (about 2,000 people). They ethnic minorities H'Mong and Thai with very difficult livelihood by shifting cultivation and forest products harvest. H'Mong villages especially, are situated just close to the best forests of NR where they often clear forest for agriculture land, hunting wildlife, harvesting forest products.

Another big problem is migration of H'Mong people from other areas into NR for settlement. FPD Son La together with NR management board have tried much to stop this situation, however, the situation does change much. Local communities hunt wildlife and cut timbers and harvest NTFPs just for their local use, not for sale because the roads are very bad. The temporary policy of Province is that to keep villages of long history of stay inside NR on the same places, supporting them to develop agriculture production, animal husbandry or seeking new production industries to reduce their pressure on forest resources. On other hand, to use any measures to stop further migration into NR and remove all migrant people outside of NR.

In regard to TSHPP, FPD Son La heard about but not yet receives any official notification, and therefore, there is no meeting/workshop to discuss about this issue. Preliminarily, it can see that TSHPP will cause significant negative impacts on NR because, NR is located just in catchments of TSHPP reservoir and very close to dam. Reservoir filling will cause inundation of forest along Quanh stream and some villages must be removed closer to NR. The forest damage should be thoroughly estimate to find mitigation solutions. Xuan Nha NR is one of the most important watershed forest of TSHPP, therefore, TSHPP Management should collaborate with Management board of Xuan Nha NR to find the best measures for mitigation of forest loss and biodiversity damages.

Note: Some documents and maps of NR were provided for our reference.

4. Consultation with People Committee of Trung Ly Commune, Quan Hoa District, Thanh Hoa Province

Date: 2 May 2008

Trung Ly Commune:

Mr. Luong Van Quang – Chairman of Commune People Committee

Mr. Luc Van Que – Deputy Chairman of Commune People Council

Summary opinions: Trung Ly Commune has been stayed here for long time. As inventory in April 2008, Trung Ly commune has 928 households, 5,200 people. Of them, H'Mong minority: 528 households, 3,337 people; Thai Minority: 330 households, 1,571 people; Muong Minority: 48 households, 205 people and Kinh (Vietnamese): 22 households, 83 people. The commune has 16 village, of which 11 villages are situated along Ma River. Trung Ly is frontier specially difficult commune with about 751 poor households (mainly H'Mong minority) by new governmental criteria (Programme 135). About 10% households faces food deficiency. Trung Ly people live by agriculture cultivation and harvesting forest products. Paddy rice land is very little (29ha only), mainly upland fields for cultivation of upland rice, corn, manihoc with low productivity. Some Thai households grow a limited area of luong bamboo. Tao village produces bamboo pieces for sale, however, in limited amount. Agriculture land of villages situated along Ma river has low fertility, therefore, the people try to encroach NR forest for new better land and move to other areas with better lands. Domestic animals husbandry is also poorly developed, inventory in April 2008 recorded 525 buffaloes, 143 horses, 257 goats, 1, 513 pigs, 690 dogs and 7,036 poultry.

TSHPP will cause inundation of low land area and several households have to resettle to new places (Ban Lin village: 16 households, Co Cai village: 14 households); other households will loose agriculture land, that will cause more difficulties for local residents. Households which should be resettled do not like new FS&FCAs planned by TSHPP because of lack of water, agricultural lands, there is only land for housing.

Because of poor agriculture production, livelihood of commune people is very difficult and much depends on forest products. The households could produce some food while other products should be harvested from the natural forests. Some most often harvested products are timbers for house construction and instrument making, bamboos (for local use and for sale), young bamboo shoots for food (local use and for sale), dong leaves (local use and for sale), mushrooms and medicine plants (local use and for sale), fishes and wild animals (local use and for sale). Most of commune forests have been exhausted due to over-harvest, the people have to illegally harvest forest products from Pu Hu NR.

Some villages have contracts with Pu Hu NR Management board for forest protection and forest regeneration, however, the contracted area is low that could not bring considerable income for local households. Pu Hu NR management board has negotiated with villages to sign Village Commitment of forest protection, however, the effectiveness is still low,

forest encroachment for agriculture land is often happened. In regard to TSHPP, Trung Ly Commune has following proposals:

- Living conditions for resettled households in new area should be equal or better those which they have now.
- Basic infrastructure facilities such as schools, roads, health service, etc.) must be constructed and also houses for poor households.
- Supporting investment, stock plants and animals of high productivity for commune households
- Pu Hu NR continues contracts with villages for forest protection with larger area to increase household income.
- Supporting commune to enrich already exhausted forests (about 5,000 ha) by additional growing of valuable timber trees
- Confiscation of hunting guns from people and negotiate household to sign village forest protection commitment
- Supporting rice for poor villages to reduce difficulties of their livelihood and also pressure on forest.
- Supporting commune land-use planning to provide households with enough land for agriculture production

5. Consultancy Meeting with Trung Son Commune People committee and villagers

Date: 1 May 2008

Trung Son Commune::

Mr. Lo Kham Thanh – Secretary of Commune Party Committee

Mr. Luong Thanh Xuan – Deputy-Chairman of Commune People Committee

10 households from Pieng Village

10 households of Ta Pan Village

General information about Trung Son Commune (Provided by Trung Son PC): Trung Son Commune has stayed in this area for long time. At present, total area of the Commune: 7,216ha, including 5,592 ha forestry land and 367 ha agriculture land. The commune has 577 households with 2,599 people. Ethnic groups include Thai, Muong, Kinh, H'Mong. Thai minority occupies about 63% total population number. The people living by agriculture cultivation (paddy rice, upland rice, other crops, etc.) husbandry cattle and poultry. The people also grow luong bamboo and *Melia azedarch* for local use and mainly for sale. Although, luong bamboo growing bring significant household income, however, livelihood of local villagers is difficult. The commune has poor infrastructure facilities, especially roads. Trung Son commune shares about 900ha forests of Pu Hu NR. Other forestry land is mainly Watershed protection forest (1,881ha) and luong bamboo plantation (28 ha). The Watershed protection forest was exhausted due to over-exploitation.

Summary opinions: Highest concern of meeting participants is household resettlement by TSHPP. In general, local villagers support TSHPP because this is a great work for the Country development, however, they show very high concern about their livelihood in new proposed FR&FCAs. The main reason is that all proposed resettlement options will lead to lack of land for agriculture production, lack of water sources or house site is very far from their agriculture lands. In the option of resettlement close to Ban Pieng Village and Pu Hu NR, available land is too small, there is only land for housing no land for production. In the option of within-village resettlement (resettlement to higher land of the same villages) there is also no land for their production, moreover, all lands already allocated to each households with tenure certificate.

In regard to use of natural forest products, all households of the commune have to harvest natural forest products for their subsistence (timber, fuelwood, medicine plants, etc.). Luong bamboo plantation can provide them some source of materials for construction and fuel, however, major sources of the materials are from natural forest (Commune Protection forest is exhausted, therefore, most of forest products are harvested from Pu Hu NR though this is prohibited by laws. The proposed resettlement households show their concern of that, in resettlement, only about 20% of woods from old house can be used, other 80% should be cut from natural forest. As Thai and Muong people do not like to stay in brick houses, they want build new wooden houses on stilts again. This will pose great pressure on forests of Pu Hu and Xuan Nha NRs.

Trung Son people have little area of paddy rice. TSHPP may submerge this lands and the people have to use upland rice production which usually has much lower productivity, consequently people should look for new lands for production, This again pose more pressure on Pu Hu and Xuan Nha NRs. Right now, some households from Ban Pieng village already ask Pu Hu NR to spend them some area of forest land for agro-cultivation.

Trung Son people suggests that TSHPP will lead to reduce their production land and makes their livelihood more difficult. They support Government to construct TSHPP, however, Government should help them to develop their economic conditions such as fund loan, stock plants and animals of higher productivity, application of advanced technology for production, buying their luong bamboos at more reasonable price than middle traders do now, etc.

5. Consultation with Xuan Nha Commune People committee

Date: 9 May 2008

Xuan Nha Commune::

Mr. Ha Xuan Dat – Secretary of Commune Party Committee

Mr. Ha Cong Duong – Deputy Secretary of Commune Party Committee

Mr. Vi Van Tham – Vice-chairman of Commune People Committee

Summary opinion: Xuan Nha Commune is special difficult commune by Governmental poverty criteria. Ethnic groups include Thai, Muong, H'Mong , Kho Mu minorities and small portion of Kinh (Vietnamese). The people live by agriculture production and forest products harvest. There is small area for paddy rice, the agricultural crops consist mainly of upland rice, corn, manihoc. Recently, Commune encourages people grow also luong bamboo, tea and cotton plantation for higher incomes. The road system is very bad, there is no road for cars to come to commune centre. At present, a new road of 3-3.5m wide is in construction to connect national 6 to Vietnam-Lao border.

TSHPP will submerge a part of production land in low elevation of villagers and Pu Lau villages should be resettled to new area. Commune People Committee request TSHPP thorough estimate the property loss (houses, plantation, etc.) of these households for appropriate compensation. The new FS&FCAs must have enough basic infrastructure facilities (schools, health care, roads, electricity, water supply, etc.) and enough land for agriculture production, including land for cotton plantation. In addition, Government should support the commune with fund loan for production, stock plants and animals of high productivities, etc.

Note: Old Xuan Nha Commune was divided into 3 new communes: Xuan Nha, Truong Xuan and Tan Xuan Commune. Pu Lau village belonging to new Xuan Nha communes while Tay Ta Lao and Dong Ta Lao villages belong to Tan Xuan Commune. Xuan Nha People Committee shows less concern about impacts of TSHPP than Tan Xuan Communes

5. Consultation Tan Xuan Commune People committee

Date: 14 May 2008

Tan Xuan Commune.:

- Mr. Ha Duy Thoan - Secretary of Commune Party Committee
- Mr. Ha Ngoc Diep – Vice-Chairman of Commune People Committee
- Mr. Vi Van Thuy – Officer of Commune People Committee
- Mr. Ha Van Hung – Chief of Ta Lao Dong village
- Mr. Ha Van Toan – Chief of Ta Lao Tay Village

Summary opinions: Tan Xuan Commune is just separate from Xuan Nha Commune. Population consists of mainly Thai, Muong and H'Mong minorities. Being located deeply in forest area of Xuan Nha NR, the commune has bad infrastructure facilities. Roads are very bad for motorbikes and almost can not used in rainy season. This is a special difficult commune be government poverty criteria. The people live by agriculture production: paddy rice, upland rice, corn, manihoc. Some households in Ta Lao Dong and Ta Lao Tay Villages grow few ha of luong bamboo. Many things for daily subsistence, the people have to collect from natural forest such as timber, bamboo, fuel wood, chit weed for brooms,

young bamboo shoots, tree barks (for sale), etc. The commune households also have contracts with Xuan Nha NR for forest protection (National programme 661) but the contracted area is not large.

TSHPP will submerge two villages Ta Lao Dong and Ta Lao Tay villages. TSHPP has planned to move people to FS&FCA no 5 in Xuan Nha Commune. The villagers very concern about this area because of not fertile land, limited lands for agriculture production and also this area no more belongs Tan Xuan Commune. The People like to seek other area with better lands.

At present, there are 5 villages of H'Mong People situated deeply inside Xuan Nha NR, their livelihood is very difficult. The people usually harvest timbers, NTFPS and hunt wildlife for their daily subsistence. They also often clear forests for shifting cultivation. Ironically, being situated inside Xuan Nha NR, many Tan Xuan people do not know where is NR boundary and where is limit of their production lands. Another problem is that H'Mong people from nearly Muong Ly Communes (Thanh Hoa Province) also often clear forest of Xuan Nha NR for agriculture land.

In regard to TSHPP, Tan Xuan people fully support TSHPP, however, people from Ta Lao Tay and Ta Lao Dong villages show very high concern about seeking place for new FR&FCA. They do not like FR&FCA No.5 as planned by TSHPP as described above. Their requests for resettlement as following:

- To allow people to find other suitable FR&FCA instead of FR&FCA No.5
- Government should pay for the loss of properties and help to stabilize their livelihood in new place.
- Ensure enough production land for each households (5-10ha per households) and support them with fund loan, stock plant and animals of high productivity, advanced cultivation technologies, etc.
- Ensure contracts of forest protection for increase of their household income
- Ensure policy of priority for vocational training of their children.

Annex 12

SOME PICTURES OF CUNSLTATION WITH LOCAL ATHOURITIES AND FIELD SURVEY



Consultation meeting with Management Board of Pu Hu NR, Thanh Hoa Prov



Discussion with forest rangers in Pa Quan Guard Station, Pu Hu NR



Consultation meeting with Management Board of Xuan Nha NR, Son La Prov.



Consultation meeting with Management Board of Hang Kia – Pa Co NR, Hoa Binh Province



Mr. Vu Van Dat - Deputy Director is introducing about Pu Hu NR



Interviewing villagers from Ta Com Village, Trung Ly commune, Thanh Hoa Prov.



Consultation meeting with Trung Son Commune PC, Thanh Hoa Prov. (Secretary of Party Committee is speaking)



A resident of Trung Son Commune is speaking out his concerns about TSHPP impacts



Consultation meeting with Xuan Nha Commune PC, Moc Chau District, Son La Province



Consultation meeting with Tan Xuan Commune PC, Moc Chau District, Son La Province



Consultation meeting with Hang Kia Commune PC, Mai Chau District, Hoa Binh Province



Consultation meeting with Trung Ly Commune PC, Muong Lat District, Thanh Hoa Prov.



Consultation meeting with Pieng and Ta Pan Villagers, Trung Son Commune, Quan Hoa District, Thanh Hoa Prov.



Interviewing villagers from Ta Pan Village, Trung Son Commune, Thanh Hoa Prov.



Interviewing villagers from Ta Lin Village, Trung Ly commune, Thanh Hoa Prov.



Discussion with forest rangers in Ta Com Guard Station, Pu Hu NR



Consultation meeting with Ta Lao Tay Villagers, Tan Xuan Commune, Quan Hoa District, Thanh Hoa Prov.



Interviewing Chairman of Pak Com Village, Hang Kia Commune, Mai Chau District, Hoa Binh Province



Natural habitat along Ma River



Survey along Ma River



Secondary tropical dense evergreen forest in Pu Hu NR



Primary tropical dense evergreen forest in Xuan Nha NR



Bamboo (Luong) plantation



Exhausted forest in buffer zone



Young regenerating forests



Upland fields in buffer zone



Black bear stuff *Ursus thibetanus* in Quan Hoa Town



Leopard cat *Prionailurus bengalensis* in Chieng Ve townlet



Skin of Owston's palm civet *Chrotogale owstoni* from Pa Quan village



Hunted stump-tailed macaque *Macaca arctoides* village



Black squirrel *Ratufa bicolor*



Leopard cat hunted from Pu Hu NR



Hunted civet *Paguma larvata*



Palm civet *Pradoxurus hermaphroditus*



Civet *Melogale moschata*



Squirrel *Callosciurus erythraeus*



Hipposideros larvatus



Hipposideros armiger



Giant squirrel *Petaurista philippensis*



Brush-tailed porcupines *Atherurus macrourus*



Rat *Niviventer fulvescens*



Bamboo rat *Rhizomys pruinosus*



Serrow horn *Naemorhedus sumatraensis*



Gaur head *Bos frontalis*



Silver pheasant *Lophura nycthemera* trapped from Pu Hu NR



Burmese Peacock Pheasant *Polyplectron bicalcatum* trapped from Pu Hu NR



Khướu bạc má *Garrulax chinensis*



Khướu khoang cổ *Garrulax monileger*



Psittacula alexandri



Streptopelia tranquebarica



Centropus sinensis



Harpactes erythrocephalus



Rhipidura allbicollis



Hypothymis azurea



Bubulcus ibis in Ma River



Butorides striatus



Hoạ mi *Garrulax canorus*



Khướu bụi đầu đen *Stachyris nigriceps*



Macronus gularis



Sasia ochracea



Lonchura striata



Ceyx erithacus



Trimeresurus stejnegeri



Bungatus fasciatus



Phisignathus cocincinus



Hemidactynus frenatus



Palea steindachneri



Platysternon megacephatum



Sacalia quadriocellata



Pycidea mauhoti



Cuora galbinifrons



Éch suôi *Rana nigrovittata*



Chẫu *Rana guentheri*



Ếch cây mép trắng *Polypedates leucomystax*



Rana taipehensis



Rana livida



Limnonectes kuhlii



Rana nigrovittata

Annex 13

MAIN CONTENTS OF TSHPP

Project title: Trung Son Hydropower Project.

Location: Head works are located in Trung Son Commune, Quan Hoa District, Thanh Hoa Province

Management agency: Trung Son HPP Management Board

Coordinates: X = 2 279 739,48; Y = 482 791,16 (VN2000)

I. Main features of TSHPP

Features	Unit	F.Study	Basic design
Catchment			
Catchment area F_{lv}	Km^2	13.175	13.175
Reservoir			
Normal full supply level	m	160	160
Dead supply level	m	152,5	150
Water volume at Normal full supply level W_{bt}	$10^6 m^3$	330,64	348,53
Water volume at death supply level W_c	$10^6 m^3$	247,2	236,40
Water surface at Normal full supply level	km^2	12,73	13,13
Main dam			
Elevation level of dam crest	m	162,4	163,7
Crest length	m	358,5	353
Maximum height of dam	m	79,6	88
Crest width	m	10	10
Spillways			
Elevation level of spillway	m	144	145
Spill gates		6	6
Energy			
Average annual electricity E_0	$10^6 KWh$	1027,78	1029,47
Discharge tunnel			
Base with (b)	m	30	70
Length (L)	m	50	80

II. Ancillary works

Item	Technical features	Occupation area (ha)
Gravel Gliding facilities & storing ground	800000 m ³ gravel/year	7,55
Rolling concrete facilities & normal concrete	300 m ³ /h + 60m ³ /h	3,72
Normal Concrete making facilities & storing ground for already made concretes	100 m ³ /h	0,51
Steel facilities	14 T/ca	0,48
Wood casing facilities	417, 000 m ³ /year	0,23
Steel casing facilities	86,26 tons	0,19
Garage and parking ground	420 vetches	7,86
Assembling facilities	3300 T/year	1,34
Explosive storage	2 x 40 T	2 x 0,25
Laboratory	-	0,21
Fire extinguish station	2 vehicle	0,06
Petrol & diesel storehouse	350 T	0,26
Technical supply storehouse	-	0,48
Hydraulic facilities	-	0,23
Water & electricity supply facilities	-	0,26
Supplementary Power supply station	2 x 500 KVA	2 x 0,05
Technical water Pumping & Treatment Station	100 m ³ /h	0,06
Living water Pumping and Treatment Station	30 m ³ /h	0,06
Stones storing ground	40000 m ³	1
Sand storing ground at quarries	209000 m ³	3,49
Right river bank Discharge ground	2161000 m ³	14,40
Left river bank Discharge ground	3287000 m ³	21,91
Offices for Contractor	330 people	0,67
Construction work camps	3600 people	5
House for offices of A Party	50 people	0,29
House for offices of consultants	50 people	0,27
Schools and kin garden	-	0,11
Health station	30 beds	0,1

Sources: PECC4

III. Landuse in Reservoir area (ha)

Province, District, commune, village	Settlement land	Paddy rice	Upland rice	Crop	Fruit tree garden	Forest			Watersurface, gravels	Total
						Plantation		Nat. forest		
						Other trees	Luong			
T. Thanh Hóa	10,24	16.06	12,09	60,14	7,78	7,06	631,99	63,04	127,16	935,55
H. Quan Hóa	5,76	14.95	5,46	52,91	4,20	0,06	410,90	0,00	19,83	514,07
X. Trung Sơn	5,76	14.95	5,46	52,91	4,20	0,06	410,90	0,00	19,83	514,07
Bản Tà Bàn	4,44	11.7	1,60	43,45	3,45	0,06	325,23		5,00	394,93
Bản Xước	0,92	2.25		3,70	0,60		47,99		3,03	58,49
Bản Co Me		0.25		5,21			15,69		7,80	30,45
Bản Quán nhục	0,40	0.75	2,36	0,55	0,15		22,00		4,00	30,21
H. Mường Lát	4,48	1.11	6,63	7,23	3,58	7,00	221,09	63,04	107,33	421,48
X. Mường Lý	3,04	0.53	0,38	3,65	1,40		179,71	27,51	46,55	262,77
Bản Nàng	1,68			1,63	0,80		56,37		8,20	68,68
Bản Kít							56,70	7,51	9,25	73,46
Bản Mau								20,00	8,75	28,75
Bản Chiềng Nưa			0,38	1,22			3,86		7,15	12,61
Bản Tài Chánh	1,36	0.53		0,80	0,60		62,63		7,00	72,92
Bản Muống 2							0,15		6,20	6,35
X. Trung Lý	1,28		6,24	2,75	1,60		38,67	35,53	44,88	130,95
Bản Ba Búa			2,24	0,96					5,68	8,88
Bản Lìn	0,64		4,00	1,79	0,85		9,30	5,28	9,12	30,98
Bản Tà Cóm								30,25	9,85	40,10
Bản Chiềng Lý	0,64				0,75		29,37		6,53	37,29
Bản U									6,45	6,45
Bản Cà Giàng									7,25	7,25
X. Tam Chung	0,16	0.58	0,01	0,83	0,58	7,00	2,71		15,90	27,76
Bản Poom Khuông							0,53		8,35	8,88
Bản Cản							0,13			0,13
Bản Poom Buôi		0.58		0,33						0,90
Bản Lát							1,50			1,50
Bản Kha Ni	0,16		0,01	0,50	0,58		0,56		7,55	9,36
L. trường M. Lát						7,00				7,00
T. Sơn La	5,04	28.43	56,89	119,20	8,59	0,60	361,36	5,30	18,00	603,40
H. Mộc Châu	5,04	28.43	56,89	119,20	8,59	0,60	361,36	5,30	18,00	603,40
X. Xuân Nha	5,04	28.43	56,89	119,20	8,59	0,60	361,36	5,30	18,00	603,40
Bản Tà Lào Đông	4,00	22.18	36,99	58,00	5,34	0,00	229,51		6,25	362,27
Bản Tà Lào Tây	0,96	3.95	19,90	57,20	3,25		67,52		3,75	156,53
Bản Pù Lâu	0,08	2.29		4,00		0,60	64,32	5,30	8,00	84,60
Total	15,28	44.48	68,98	179,34	16,37	7,66	993,35	68,34	145,16	1538,95

Source: PECCA

- ***Inside construction roads***

- Construction-transport road connecting National road 15A (from Co Luong to Co Me Village) on the right bank of Ma river, 20.12 km long. In first period 1: gravelled road with surface width of 5.5m and base width of 7.5m. In second period: the road will be paved with asphalt.
- Road VH1 for construction of main dam, spillway and water intake gates is 2.1 km long. In the first period, the road has base of 7.5m and gravelled surface of 5.5 m wide and in second period, the road will be paved to 5.5m wide.
- Road VH2 for construction of power station is 0.91 km long. In the first period, the road has base of 7.5m and gravelled surface of 5.5 m wide and in second period, the road will be paved to 5.5m wide.
- Roads for construction of 10.4 km long including road to quarries, ancillary facilities, waste grounds, storing ground and work locations. Roads have base of 7.5 m long, gravelled surface of 5.5 m wide.

- ***Natural construction materials***

- Stone quarries: located on right and left banks of Ma river at distance of 8 km always from work line towards upstream.
- Sand quarries: 3 sand quarries available of about 225.000m³.
- Soil quarries: on the right bank of Ma river in distance of about 10 km and have volume of 4 million m³.

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- **Fixed Resettlement and fixed cultivation Areas (FR&FCAs)**

According to EIA report of TSHPP (January 2008) made by PECC4, there will 4 FR&FCAs and current landuse of these FR&FCAs are as following:

FR&FCA No.1 – Trung Son Commune: Area of 3,540ha, for 216 households with 1,030 people from 2 villages (Ta Pan Village: 190 households with 910 people, Xuoc Village: 26 households with 120 people). Current land-use includes mainly forestry land (1,809 ha), un-used land (1,306.8ha), agricultural land (229.2ha) and non-agricultural land (195 ha).

FR&FCA No.2 – Muong Ly Commune: Area of 1,910ha, for 85 households with 461 people from 2 villages (Nang 1 Village: 47 households with 255 people, Tai Chanh Village: 38 households with 206 people). Current land-use includes mainly forestry land (864 ha), un-used land (643.4ha), agricultural land (228.6ha) and non-agricultural land (174 ha).

FR&FCA No.3 – Trung Ly Commune: Area of 1,050ha, for 36 households with 195 people from 2 villages (Lin Village: 18 households with 107 people, Chieng Village: 18 households with 88 people). Current land-use includes mainly forestry land (733 ha), unused land (172.1ha), agricultural land (68.2 ha) and non-agricultural land (76.7 ha).

FR&FCA No.4 – Xuan Nha Commune: Area of 1,200ha, for 170 households with 834 people from 2 villages Dong Ta Lao (113 households, 512 people) and Tay Ta Lao (57 households, 322 people). Agriculture land: 162ha, Protection forest land: 98 ha and non-used land: 932ha and non-agricultural land: 8 ha.

- **Construction schedule**

The TSHPP will be constructed for 5 years, including 1 year for preparation and 4 years for construction as following:

Preparation year: Construction of road network, water and electricity supply network, living houses/camps and ancillary works, compensation work, FR&FCAs.

In the beginning of July, Main dam foundation construction on dry land will be initiated. Natural river flow remains.

Construction year 1: Beginning construction of foundations of power station, water intake gates, pressure tunnels. Construction of flow divert tunnel in left river bank at 86.0 m high. Completion in May. Natural river flow remains

Construction year 2: Dry season: in beginning of December, river blockage started. Construction of dam foundation at river bed for 2 months. Construction RCC concrete dam until the end of May, part in river bed up to elevation of 105.0 m, parts in left and right river banks up to 115.0m. In the end of 3-d quarter: completion of concrete work of water intake gates, and beginning equipment installation. Concrete installation of power station up to equipment installation level.

Construction year 3: Completion of equipment installation in water intake gates by the end of June. Completion of concrete work at main dam. In September, installation of flap spill gate. Completion of concrete work of discharge tunnel. Installation of hydraulic mechanical equipment.

Construction year 4: In May, beginning water filling into reservoir. Installation of spillway equipment completed in July. In July, first power generators No. 1 begins to operate. in October, all construction completed, all power generators operating.