Annex 1: List of species analyzed for grouping

Species[10]	Number of trees	Average diameter (cm)	Average diameter increment (cm)	Commer-cial status[11]	DME[12] (cm)
Allanblackia floribunda	9	12.53	0.25	2	50
Alstonia boonei	8	117.00	5.38	2	60
Anthonota fragrans	184	40.04	2.83	2	50
Canarium schweinfurthii	14	61.28	2.38	1	60
Ceiba pentandra	82	36.81	3.83	2	60
Dacryodes klaineana	455	29.62	1.04	2	50
Daniella oblonga	14	28.82	3.19	2	60
Diospyros crassiflora	247	13.19	0.71	1	50
Diospyros sanza-minika	947	21.17	0.75	2	50
Entandrophragma angolense	15	60.33	4.04	1	80
Entandrophragma candollei	9	18.17	1.16	1	80
Entandrophragma cylindricum	31	13.73	0.75	1	100
Entandrophragma utile	48	35.48	1.54	1	80
Erythrophleum ivorense	25	60.39	3.43	1	60
Erythroxylum mannii	36	34.35	4.39	2	60
Fagara heitzii	10	32.13	4.1	2	60
Fagara macrophylla	6	62.30	0	2	60
Funtumia elastica	12	57.26	1.73	2	50
Garcinia cola	40	14.31	0.88	2	50
Irvingia gabonensis	17	18.60	1.14	2	50
Khaya ivorensis	19	56.10	6.72	1	80
Lannea welwitschii	7	18.40	1.45	2	50
Lophira alata	8	67.23	1.25	1	60
Lovoa trichilioides	68	33.76	2.85	1	80
Mammea africana	22	55.4	1.11	2	60
Nauclea diderrichii	16	48.39	1.25	1	60
Nesogordonia papaverifera	130	49.86	3.08	1	50
Newtonia griffoniana	26	13.82	2.06	2	50
Panda oleosa	159	28.88	1.6	2	50
Parinari excelsa	67	57.88	2.40	2	50
Parkia bicolor	108	75.61	0.78	2	50

[10] See annex 2 for pilot names
[11] 1=currently commercial, 2=potentialy commercial
[12] Minimum Diameter Exploitable

Pentaclethra macrophylla	17	65.02	2.2	2	50
Pentadesma grandifolia	19	37.23	1.1	2	50
Pericopsis elata	37	25.02	0.53	1	100
Petersianthus macrocarpus	40	12.91	0.65	2	50
Piptadeniastrum africanum	37	41.6	0.7	2	60
Pterocarpus soyauxii	7	11.24	1.00	1	60
Pterygota macrocarpa	134	51.19	5.25	1	60
Pycnanthus angolensis	122	67.88	2.09	1	60
Ricinodendron heudelotii	13	87.42	1.55	2	50
Scottelia coriacea	231	23.01	0.86	2	50
Terminalia superba	36	55.81	3.05	1	60
Triplochiton scleroxylon	16	74.88	1.61	1	80
Uapaca guineensis	168	76.57	2.27	2	50
Xylopia staudtii	19	14.11	6.56	2	50
Total	**3735**				

Annex 2: Correspondence between pilot and scientific names for tree species[13] inventoried at the TCP research site

Pilot names	***Scientific names***
Abale	*Petersianthus macrocarpus*
Abam a poil rouge	*Gambeya beguei*
Abam fruts jaune	*Gambeya gigantea*
Abam littoral	*Berlinia craibiana*
Abam vrai	*Gambeya lacourtiana*
Abura	*Mitragyna stipulosa*
Acajou à grandes folioles	*Khaya grandifoliola*
Acajou blanc	*Khaya anthotheca*
Acajou de bassam	*Khaya ivorensis*
Aiélé	*Canarium schweinfurthii*
Ako A	*Antiaris africana*
Ako W	*Antiaris welwitschii*
Akodiakede	*Pterygota bequaertii*
Alep	*Desbordesia glaucescens*
Alumbi	*Julbernardia seretii*
Amvout	*Tricoscypha acuminata*
Amvout a poils	*Tricoscypha abut*
Andok	*Irvingia gabonensis*
Andok Ngoe	*Irvingia grandifolia*
Andok osoe	*Irvingia excelsa*
Andoung rose	*Monopetalanthus letestui*
Angelin	*Andira inermis*
Angueuk	*Ongokea gore*
Aningré A	*Aningeria altissima*
Aningré R	*Aningeria robusta*
Anzem	*Copefera religiosa*
Asila koufani	*Maranthes chrysophylla*
Assamela	*Pericopsis elata*
Atom	*Dacryodes macrophylla*
Avodiré	*Turraeanthus africanus*
Awoura	*Paraberlinia bifoliolata*
Ayous	*Triplochiton scleroxylon*
Azobé	*Lophira alata*
Bahia	*Mitragyna ciliata*
Bete	*Mansonia altissima*
Bilnga	*Nauclea diderrichii*
Bodia	*Anopyxis klaineana*

[13] Most of these species are also met in west Africa

Bongo H	*Faraga heitzii*
Bossé clair	*Guarea cedrata*
Bossé Foncé	*Guarea thompsonii*
Bubinga E	*Guibourtia ehie*
Bubinga Rouge	*Guibourtia demeusei*
Bubinga Rose	*Guibourtia tessmannii*
Crabwood d'Afrique	*Carapa procera*
Crabwood de montagne	*Carapa grandiflora*
Dabéma	*Piptadeniastrum africanum*
Dambala	*Discoglypremna caloneura*
Diana	*Celtis tessmannii*
Diana parallele	*Celtis adolfi-friderici*
Diana Z	*Celtis zenkeri*
Dibetou / Bibolo	*Lovoa trichilioides*
Difou	*Morus mesozygia*
Divida	*Scorodophleus zenkeri*
Doussié blanc	*Afzelia pachyloba*
Doussié rouge	*Afzelia bipindensis*
Doussié sanaga	*Afzelia africana*
Ebène	*Diospyros crassiflora*
Ebiara edea	*Berlinia bracteosa*
Ebiara Yaounde	*Berlinia grandiflora*
Ekaba	*Tetraberlinia bifoliolata*
Ekop leke	*Brachystegia zenkeri*
Ekop naga akolodo	*Brachystegia eurycoma*
Ekop naga nord-ouest	*Brachystegia kennedyi*
Ekop ngombe mamelle	*Didelotia unifoliolata*
Ekouné	*Coelocaryon preussii*
Emien	*Alstonia boonei*
Esabem	*Berlinia confusa*
Eseng grandes feuilles	*Parkia filicoidea*
Essak	*Albizia glaberrima*
Essesang	*Ricinodendron heudelotii*
Esson	*Stemonocoleus micranthus*
Etimoé	*Copaïfera mildbraedii*
Eveuss	*Klainedoxa gabonensis*
Evoula	*Vitex grandifolia*
Eyek	*Pachyelasma tessmannii*
Eyong	*Eribroma oblongum*
Eyoum	*Dialium pachyphyllum*
Eyoum petites feuilles	*Dialium dinklagei*
Eyoum rouge	*Dialium bipindense*
Faro	*Daniellia ogea*
Faro mezilli	*Daniellia klainei*
Frakɔ	*Terminalia superba*

Framiré	*Terminalia ivorensis*
Fromager	*Ceiba pentandra*
Gombe	*Didelotia letouzeyi*
Gombe zing	*Toubaouate brevipaniculata*
Ilomba	*Pycnanthus angolensis*
Johimbe	*Pausinystalia johimbe*
Kanda	*Beilschmiedia obscura*
Kanda grandes feullies	*Beilschmiedia anacardioides*
Kapokier	*Bombax buonopozense*
Kekele	*Holoptelea grandis*
Kibakoko feuilles argentees	*Anthonotha fragrans*
Kondroti	*Rhodognaphalon brevicuspe*
Kossipo	*Entandrophragma candollei*
Kotibé	*Nesogordonia papaverifera*
Koto	*Pterygota macrocarpa*
Kumbi	*Lannea welwitschii*
Landa	*Erythroxylum mannii*
Lantandza	*Albizia ferruginea*
Lati	*Amphimas ferrugineus*
Limbali	*Gilbertiodendron dewevrei*
Lo	*Parkia bicolor*
Longhi	*Guambea africana*
Lotofa	*Sterculia rhinopetala*
Makoré	*Tieghemella africana*
Mambode	*Detarium macrocarpum*
Miama	*Calpocalyx heitzii*
Miove	*Staudtia kamerunensis*
Moabi	*Baillonella toxisperma*
Moambe jaune	*Enantia chlorantha*
Movingui	*Distemonanthus benthamianus*
Mubala	*Pentaclethra macrophylla*
Mukulungu	*Autranella congolensis*
Mukumari	*Cordia platythyrsa*
Mutondo	*Funtumia elastica*
Naga	*Brachystegia cynometriodes*
Naga parrallele	*Brachystegia mildbraedii*
Nganga	*Cynometra hankei*
Nom abam	*Gambeya boukokoensis*
Nom andok	*Irvingia robur*
Nom kanda	*Beilschmiedia sp.*
Oboto	*Mammea africana*
Odouma	*Gossweilerodendron joveri*
Ohia	*Celtis mildbraedii*
Okan	*Cylicodiscus gabunensis*
Okoumé	*Aucoumea klaineana*

Omang bikodok	*Maranthes gabunensis*
Onzambili K	*Antrocaryon klaineanum*
Onzambili M	*Antrocaryon micraster*
Osanga	*Pteleopsis hylodendron*
Ouochi	*Albizia zygia*
Ovoga	*Poga oleosa*
Ozigo	*Dacryodes buettneri*
Ozouga	*Sacoglottis gabonensis*
Padouk blanc	*Pterocarpus mildbraedii*
Padouk rouge	*Pterocarpus soyauxii*
Pao rosa	*Swartzia fistuloides*
Podo	*Podocarpus milanjianus*
Rikio	*Uapaca guineensis*
Saliyemo	*Albizia adianthifolia*
Sapelli	*Entandrophragma cylindricum*
Sipo	*Entandrophragma utile*
Tali	*Erythrophleum ivorense*
Tali Yaounde	*Erythrophleum suaveolens*
Tchitola	*Oxystigma oxyphyllum*
Tiama	*Entandrophragma angolense*
Tiama congo	*Entandrophragma congoense*
Tola	*Gossweilerodendron balsamiferum*
Tsanya-akela	*Pausinystalia macroceras*
Wamba	*Tessmannia anomala*
Wamba grande feuilles	*Tessmannia africana*
Wengé	*Milletia laurentii*
Yungu	*Drypetes gossweileri*
Zingana	*Microberlinia bisulcata*
Zoa ele	*Monopetalanthus hedinii*

Annex 3: SPSS Cluster analysis output for species aggregation

Data written to the working file:
6 variables and 43 cases written.

Variable: SPP	Type: String	Format: A12
Variable: NTREES	Type: Number	Format: F12.2
Variable: DIA	Type: Number	Format: F10.2
Variable: DINC	Type: Number	Format: F10.2
Variable: DME	Type: Number	Format: F10.2
Variable: FOB	Type: Number	Format: F10.2

Variable codes:

SPP	= Species
DIA	= Diameter at first mensuration
DINC	= Diameter increment
DME	= Minimum diameter exploitable
FOB	= Free on board price
NTREES	= Number of trees

Case Processing Summary:

Cases					
Valid		Missing		Total	
N	Percent	N	Percent	N	Percent
43	100.0%	0	0%	43	100.0%

A Squared Euclidean Distance used

Cluster Membership:

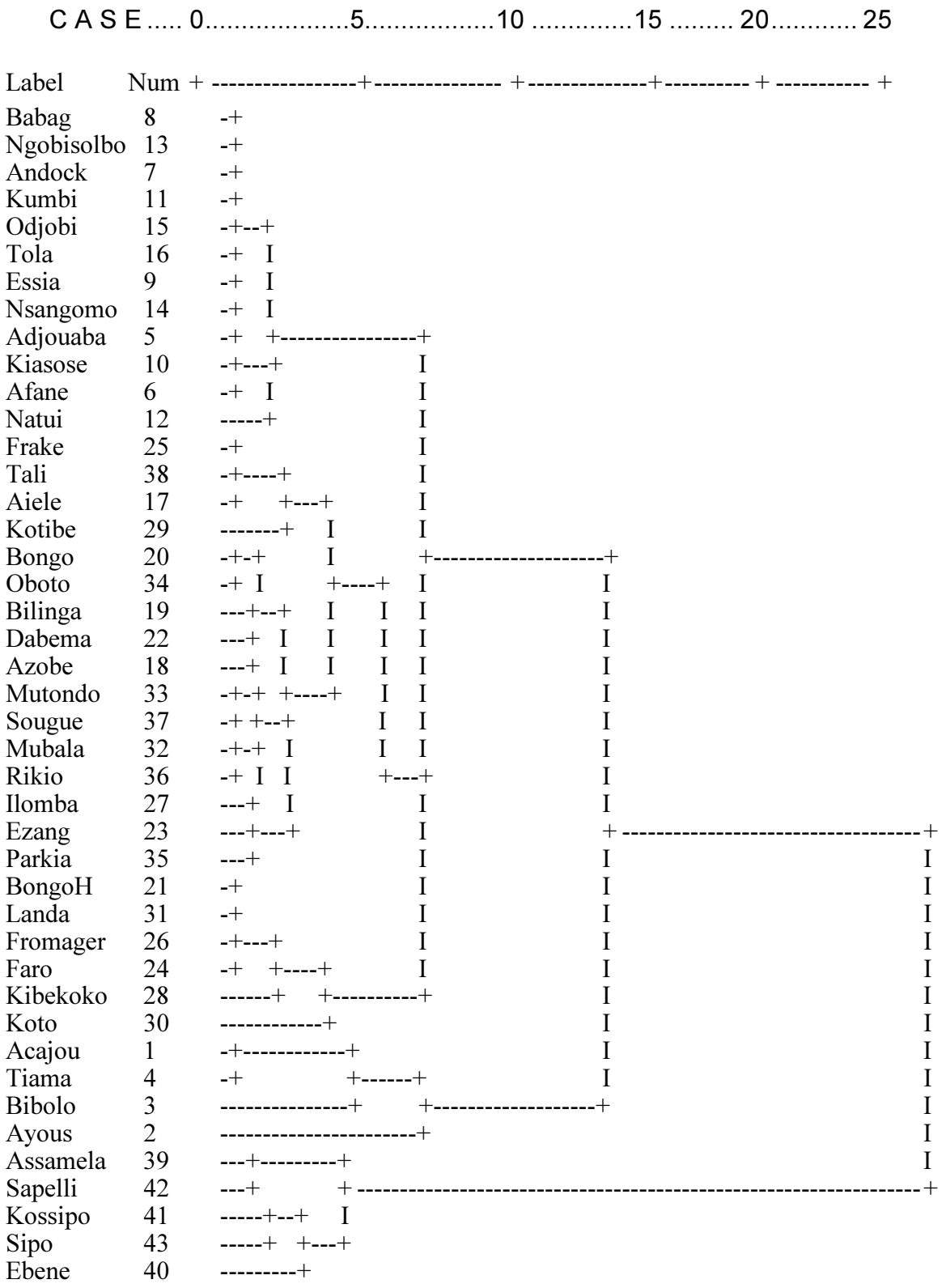
Case	4 Clusters
1:Acajou	1
2:Ayous	1
3:Bibolo	1
4:Tiama	1
5:Adjouaba	2
6:Afane	2
7:Andock	2
8:Babang	2
9:Essia	2
10:Kiasose	2
11:Kumbi	2
12:Natui	2
13:Ngobisolbo	2
14:Nsangomo	2
15:Odjobi	2
16:Tola	2

17:Aiele	3
18:Azobe	3
19:Bilinga	3
20:Bongo	3
21:BongoH	3
22:Dabema	3
23:Ezang	3
24:Faro	3
25:Frake	3
26:Fromager	3
27:Ilomba	3
28:Kibekoko	3
29:Kotibe	3
30:Koto	3
31:Landa	3
32:Mubala	3
33:Mutondo	3
34:Oboto	3
35:Parkia	3
36:Rikio	3
37:Sougue	3
38:Tali	3
39:Assamela	4
40:Ebene	4
41:Kossipo	4
42:Sapelli	4
43:Sipo	4

* * * H I E R A R C H I C A L C L U S T E R A N A L Y S I S * * *

Dendrogram using Centroid Method

Rescaled Distance Cluster Combine



Annex 4: Summary of data used for the development of bole volume equations

Species	Felled trees	Standing trees	Total
	number of trees		
Aiele	0	12	12
Amouk	0	3	3
Azobe	34	39	73
Bibolo	5	10	15
Bilinga	0	6	6
Bongo	0	6	6
Bosse	3	0	3
Dabema	0	10	10
Diana	0	4	4
Doussie	4	9	13
Ebiara	0	5	5
Ekoune	0	8	8
Emien	0	9	9
Eyong	0	10	10
Frake	2	55	57
Fromager	0	5	5
Illomba	0	5	5
Iroko	0	11	11
Kossipo	1	1	2
Kumbi	0	2	2
Moabi	2	13	15
Movingui	8	58	66
Mutondo	0	4	4
Ngollon	7	0	7
Niove	1	7	8
Okang	0	6	6
Ozambili	0	8	8
Padouk	16	52	68
Sipo	1	3	4
Tali	17	34	51
Tiama	2	1	3
Tola	0	1	1
Total	**103**	**397**	**500**

Annex 5: Statistics of the estimation of bole volume equations for different species groups

A.5.1: Statistics for curve estimation models for species group 1

Method	R^2	Standard Error	b_0	b_1	b_2	curve model
Linear	0.896	1.442	-4.887	14.914		$V=b_0+b_1(DBH)$
Logarithmic	0.811	1.948	9.614	9.174		$V=b_0+b_1\ln(DBH)$
Quadratic	0.915	1.320	-1.020	2.451	8.510	$V=b_0+b_1(DBH)+b_2(DBH)^2$
Power	0.932	0.267	9.891	2.247		$V=b_0(DBH)^{b1}$

A.5.2: Statistics for curve estimation models for species group 2

Method	R^2	Standard Error	b_0	b_1	b_2	curve model
Linear	0.864	0.936	-3.610	11.610		$V=b_0+b_1(DBH)$
Logarithmic	0.744	1.283	6.818	6.104		$V=b_0+b_1ln(DBH)$
Quadratic	0.898	0.813	-0.713	1.513	7.808	$V=b_0+b_1(DBH)+b_2(DBH)^2$
Power	0.910	0.255	8.872	2.270		$V=b_0(DBH)^{b1}$

A.5.3: Statistics for curve estimation models for species group 3

Method	R^2	Standard Error	b_0	b_1	b_2	curve model
Linear	0.816	2.768	-5.507	15.723		$V=b_0+b_1(DBH)$
Logarithmic	0.680	3.653	10.546	10.143		$V=b_0+b_1ln(DBH)$
Quadratic	0.842	2.572	-1.519	4.376	6.526	$V=b_0+b_1(DBH)+b_2(DBH)^2$
Power	0.886	0.413	8.683	2.196		$V=b_0(DBH)^{b1}$

A.5.4: Statistics for curve estimation models for species group 4

Method	R^2	Standard Error	b_0	b_1	b_2	curve model
Linear	0.911	3.338	-8.524	21.622		$V=b_0+b_1(DBH)$
Logarithmic	0.708	6.067	15.009	15.618		$V=b_0+b_1ln(DBH)$
Quadratic	0.944	2.671	-2.579	6.598	6.876	$V=b_0+b_1(DBH)+b_2(DBH)^2$
Power	0.946	0.326	9.576	2.264		$V=b_0(DBH)^{b1}$

In the four preceding tables the terms are defined as:
V= average tree volume for a given diameter in m^3
b_o = a constant
b_n = regression coefficient
DBH = tree diameter at breast height in m
ln = the natural log base
R^2= the coefficient of determination

Annex 6: Summary of permanent sample plots data

Plot	Ing1	Ing2	Ing3	Ing4	Basal area (m2)	nt1	nt2	nt3	nt4	Ntot
1	0	10	18	0	25.27	60	114	65	59	298
2	1	10	19	0	22.8	64	145	70	63	342
3	0	55	1	0	25.06	89	136	98	96	419
4	0	28	2	0	25.86	55	152	59	55	321
5	0	71	1	1	23.71	71	86	82	87	326
6	0	45	16	0	20.10	69	95	79	91	334
7	0	30	13	2	21.24	85	147	89	108	429
8	1	60	30	7	25.02	59	72	64	100	295
9	0	11	0	1	22.40	72	87	101	117	377
10	0	43	5	4	23.69	59	103	65	68	295
11	0	22	5	2	25.70	57	209	67	57	390
12	0	11	4	1	19.95	71	188	76	71	406
13	0	12	1	0	19.95	57	70	71	55	253
14	1	19	10	3	24.46	73	97	113	103	386
15	3	22	6	0	20.46	73	136	75	79	363
16	3	30	4	0	28.64	86	178	92	90	446
17	0	18	21	1	21.51	63	100	70	61	294
18	0	33	7	3	20.65	76	105	71	69	321
19	0	12	20	0	21.60	73	128	81	70	352
20	2	30	15	1	21.75	81	199	84	82	446
Total	11	572	198	26	459.82	1393	2547	1572	1581	7093
Average	0.6	28.6	9.9	1.3	22.991	69.7	127.35	78.6	79.05	354.65

Notes: Ing1, Ing2, Ing3 and Ing4 represent the number of ingrowth trees for respective species group in each plot. Similarly, nt1, nt2, nt3 and nt4 represent number of trees per plot and respective species groups, while Ntot represents the total number of trees per plot.

Annex 7: Statistics on variable selection for the estimation of transitions probabilities by logistic regression analysis[14]

A.7.1: Species group 1 (59 cases)

Variable	B	S.E.	Wald	Sig
BA	-0.1088	0.0878	1.5348	0.2154
D^2	-6.8518	3.5569	3.7107	0.0541
D	8.1934	4.1212	3.9527	0.0468
N	-0.0032	0.0053	0.3489	0.5548
Constant	1.6013	3.1365	0.2606	0.6097

A.7.2: Species group 2 (1220 cases)

Variable	B	S.E.	Wald	Sig.
BA	-0.2907	0.2290	0.8487	0.1720
D^2	-12.4234	2.3987	26.8254	0.0000
D	13.3004	2.1492	38.2965	0.0000
N	-0.0010	0.0019	0.2709	0.6027
Constant	2.7677	1.0684	6.7100	0.0096

A.7.3: Species group 3 (200 cases)

Variable	B	S.E.	Wald	Sig.
BA	-0.1180	0.0829	2.0263	0.1546
D^2	-10.4284	1.8956	30.2651	0.0000
D	15.1394	2.6275	33.2004	0.0000
N	0.0046	0.0037	1.5354	0.2153
Constant	-3.5668	1.8879	3.5694	0.0589

A.7.4: Species group 4 (256 cases)

Variable	B	S.E	Wald	Sig.
BA	-0.92135	0.5468	1.7352	0.2635
D^2	-7.1892	6.8265	1.1091	0.2923
D	11.1278	5.5820	3.9741	0.0462
N	1.0027	0.7592	0.6235	0.1985
Constant	-3.9901	0.8209	23.6273	0.0000

BA = basal area
D^2 = diameter squared
D = diameter
N = number of trees in the stand
B = regression coefficient
S.E = standard Error
Sig. = level of significance

[14]These statistics were considered only for variable selection. Once the significant variables were known, new coefficients were estimated based only on the significant variables.

Annex 8: Data for testing the homogeneity of measurements

Tree number	Standing volume (m^3)	Felled volume (m^3)	Difference
1	14.53	14.58	-0.05
2	10.27	10.01	0.26
3	12.94	12.60	0.34
4	11.84	12.04	-0.20
5	33.13	33.44	-0.31
6	14.08	13.49	0.59
7	17.64	17.50	0.14
8	9.96	10.01	-0.05
9	8.86	9.96	-1.10
10	15.55	14.64	0.91
11	16.07	15.28	0.79
12	8.61	8.62	-0.01
13	36.10	37.17	-1.07
14	11.63	11.24	0.39
15	7.93	8.09	-0.16
16	12.81	13.33	-0.52
17	8.57	8.93	-0.35
18	11.44	13.33	-1.88
19	9.39	8.50	0.89
20	14.03	13.55	0.48
21	14.10	14.64	-0.55
22	14.66	13.96	0.70
23	13.71	14.24	-0.53
24	8.13	7.05	1.09
25	18.49	18.27	0.22
26	20.99	19.77	1.23
27	14.63	14.25	0.38

Annex 9: Estimated growth matrices per species group

A.9.1: Growth matrix for species group 1

0.59	0	0	0	0	0	0	0	0	0
0.31	0.47	0	0	0	0	0	0	0	0
0	0.43	0.37	0	0	0	0	0	0	0
0	0	0.53	0.31	0	0	0	0	0	0
0	0	0	0.59	0.28	0	0	0	0	0
0	0	0	0	0.62	0.29	0	0	0	0
0	0	0	0	0	0.61	0.33	0	0	0
0	0	0	0	0	0	0.57	0.41	0	0
0	0	0	0	0	0	0	0.49	0.62	0
0	0	0	0	0	0	0	0	0.38	0.9

A.9.2: Growth matrix for species group 2

0.76	0	0	0	0	0	0	0	0	0
0.14	0.68	0	0	0	0	0	0	0	0
0	0.22	0.61	0	0	0	0	0	0	0
0	0	0.29	0.56	0	0	0	0	0	0
0	0	0	0.34	0.55	0	0	0	0	0
0	0	0	0	0.35	0.56	0	0	0	0
0	0	0	0	0	0.34	0.61	0	0	0
0	0	0	0	0	0	0.29	0.68	0	0
0	0	0	0	0	0	0	0.22	0.75	0
0	0	0	0	0	0	0	0	0.15	0.9

A.9.3: Growth matrix for species group 3

0.82	0	0	0	0	0	0	0	0	0
0.08	0.7	0	0	0	0	0	0	0	0
0	0.2	0.54	0	0	0	0	0	0	0
0	0	0.36	0.38	0	0	0	0	0	0
0	0	0	0.52	0.28	0	0	0	0	0
0	0	0	0	0.62	0.23	0	0	0	0
0	0	0	0	0	0.67	0.22	0	0	0
0	0	0	0	0	0	0.68	0.26	0	0
0	0	0	0	0	0	0	0.64	0.35	0
0	0	0	0	0	0	0	0	0.55	0.9

A.9.4: Growth matrix for species group 4

0.82	0	0	0	0	0	0	0	0	0
0.08	0.77	0	0	0	0	0	0	0	0
0	0.13	0.69	0	0	0	0	0	0	0
0	0	0.21	0.59	0	0	0	0	0	0
0	0	0	0.31	0.47	0	0	0	0	0
0	0	0	0	0.43	0.33	0	0	0	0
0	0	0	0	0	0.57	0.21	0	0	0
0	0	0	0	0	0	0.69	0.11	0	0
0	0	0	0	0	0	0	0.79	0.03	0
0	0	0	0	0	0	0	0	0.87	0.9

Annex 10: Sample list file of AIMMS for the determination of steady state characteristics for the 30-year cutting cycle

!Extended formulation CC=30

Variables:
y11->[0,inf),
y12->[0,inf),
Y13->[0,inf),
y14->[0,inf),
y15->[0,inf),
y16->[0,inf),
y17->[0,inf),
y18->[0,inf),
y19->[0,inf),
y10->[0,inf),
h11->[0,inf),
h12->[0,inf),
h13->[0,inf),
h14->[0,inf),
h15->[0,inf),
h16->[0,inf),
h17->[0,inf),
h18->[0,inf),
h19->[0,inf),
h10->[0,inf),
y21->[0,inf),
y22->[0,inf),
Y23->[0,inf),
y24->[0,inf),
y25->[0,inf),
y26->[0,inf),
y27->[0,inf),
y28->[0,inf),
y29->[0,inf),
y20->[0,inf),
h21->[0,inf),
h22->[0,inf),
h23->[0,inf),
h24->[0,inf),
h25->[0,inf),
h26->[0,inf),
h27->[0,inf),
h28->[0,inf),
h29->[0,inf),
h20->[0,inf),
y31->[0,inf),
y32->[0,inf),

Y33->[0,inf),
y34->[0,inf),
y35->[0,inf),
y36->[0,inf),
y37->[0,inf),
y38->[0,inf),
y39->[0,inf),
y30->[0,inf),
h31->[0,inf),
h32->[0,inf),
h33->[0,inf),
h34->[0,inf),
h35->[0,inf),
h36->[0,inf),
h37->[0,inf),
h38->[0,inf),
h39->[0,inf),
h30->[0,inf),
y41->[0,inf),
y42->[0,inf),
Y43->[0,inf),
y44->[0,inf),
y45->[0,inf),
y46->[0,inf),
y47->[0,inf),
y48->[0,inf),
y49->[0,inf),
y40->[0,inf),
h41->[0,inf),
h42->[0,inf),
h43->[0,inf),
h44->[0,inf),
h45->[0,inf),
h46->[0,inf),
h47->[0,inf),
h48->[0,inf),
h49->[0,inf),
h40->[0,inf),

d1->[0,inf),
d2->[0,inf),
d3->[0,inf),
d4->[0,inf),
DTOT->[0,inf),
d11->[0,inf),
d12->[0,inf),
d13->[0,inf),
d14->[0,inf),
d15->[0,inf),

d16->[0,inf),
d17->[0,inf),
d18->[0,inf),
d19->[0,inf),
d10->[0,inf),
d21->[0,inf),
d22->[0,inf),
d23->[0,inf),
d24->[0,inf),
d25->[0,inf),
d26->[0,inf),
d27->[0,inf),
d28->[0,inf),
d29->[0,inf),
d20->[0,inf),
d31->[0,inf),
d32->[0,inf),
d33->[0,inf),
d34->[0,inf),
d35->[0,inf),
d36->[0,inf),
d37->[0,inf),
d38->[0,inf),
d39->[0,inf),
d30->[0,inf),
d41->[0,inf),
d42->[0,inf),
d43->[0,inf),
d44->[0,inf),
d45->[0,inf),
d46->[0,inf),
d47->[0,inf),
d48->[0,inf),
d49->[0,inf),
d40->[0,inf),

l10->[0,inf),
l24->[0,inf),
l25->[0,inf),
l26->[0,inf),
l27->[0,inf),
l28->[0,inf),
l29->[0,inf),
l20->[0,inf),
l30->[0,inf),
l40->[0,inf),

NY1->[0,inf),
NY2->[0,inf),

NY3->[0,inf),
NY4->[0,inf),
NH1->[0,inf),
NH2->[0,inf),
NH3->[0,inf),
NH4->[0,inf),
NY->[0,inf),
NH->[0,inf),
NTOT->[0,inf),
BAH1->[0,inf),
BAH2->[0,inf),
BAH3->[0,inf),
BAH4->[0,inf),
BAH->[0,inf),
BAY->[0,inf),
BAY1->[0,inf),
BAY2->[0,inf),
BAY3->[0,inf),
BAY4->[0,inf),
VH1->[0,inf),
VH2->[0,inf),
VH3->[0,inf),
VH4->[0,inf),
VH->[0,inf),
BATOT->[0,inf);

Constraints:

!sustained yield constraints
S1..0.04*(y11-d11)=y11-1.40,
S2..0.08*(y11-d11)+0.01*(y12-d12)=y12-0.73,
S3..0.11*(y11-d11)+0.04*(y12-d12)+0.00*(y13-d13)=y13-0.39,
S4..0.12*(y11-d11)+0.08*(y12-d12)+0.01*(y13-d13)+0.00*(y14-h14-d14)=y14-0.20,
S5..0.10*(y11-d11)+0.13*(y12-d12)+0.05*(y13-d13)+0.01*(y14-h14-d14)+0.00*(y15-h15-d15)=y15-0.08,
s6..0.06*(y11-d11)+0.15*(y12-d12)+0.12*(y13-d13)+0.04*(y14-h14-d14)+0.01*(y15-h15-d15)+0.00*(y16-h16-d16)=y16-0.02,
s7..0.02*(y11-d11)+0.10*(y12-d12)+0.18*(y13-d13)+0.12*(y14-h14)+0.05*(y15-h15-d15)+0.01*(y16-h16-d16)+0.00*(y17-h17-d17)=y17,
s8..0.03*(y12-d12)+0.13*(y13-d13)+0.20*(y14-h14-d14)+0.15*(y15-h15-d15)+0.07*(y16-h16-d16)+0.02*(y17-h17-d17)+0.00*(y18-h18-d18)=y18,
s9..0.03*(y13)+0.14*(y14-h14-d14)+0.24*(y15-h15-d15)+0.25*(y16-h16-d16)+0.20*(y17-h17-d17)+0.12*(y18-h18-d18)+0.06*(y19-h19-d19)=y19,
s10..0.02*(y14-h14-d14)+0.11*(y15-h15-d15)+0.26*(y16-h16-d16)+0.42*(y17-h17-d17)+0.55*(y18-h18-d18)+0.64*(y19-h19-d19)+0.50*(y10-h10-d10)=y10,

s11..0.193*(y21-d21)=y21-96.20,
s12..0.164*(y21-d21)+0.099*(y22-d22)=y22-27.41,

s13..0.102*(y21-d21)+0.149*(y22-d22)+0.052*(y23-d23)=y23-7.99,
s14..0.050*(y21-d21)+0.140*(y22-d22)+0.120*(y23-d23)+0.031*(y24-h24-d24)=y24-2.01,
s15..0.018*(y21-d21)+0.094*(y22-d22)+0.160*(y23-d23)+0.107*(y24-h24-d24)+0.028*(y25-h25-d25)=y25-0.36,
s16..0.004*(y21-d21)+0.040*(y22-d22)+0.128*(y23-d23)+0.171*(y24-h24-d24)+0.111*(y25-h25-d25)+0.031*(y26-h26)=y26-.03,
s17..0.0004*(y21-d21)+0.009*(y22-d22)+0.059*(y23-d23)+0.150*(y24-h24-d24)+0.193*(y25-h25)+0.141*(y26-h26-d26)+0.050*(y27-h27-d27)=y27,
s18..0.001*(y22-d22)+0.012*(y23-d23)+0.062*(y24-h24-d24)+0.150*(y25-h25-d25)+0.216*(y26-h26-d26)+0.200*(y27-h27-d27)+0.100*(y28-h28-d28)=y28,
s19..0.001*(y23-d23)+0.010*(y24-h24-d24)+0.045*(y25-h25-d25)+0.120*(y26-h26-d26)+0.210*(y27-h27-d27)+0.250*(y28-h28-d28)+0.180*(y29-h29-d29)=y29,
s20..0.000*(y24-h24-d24)+0.005*(y25-h25-d25)+0.024*(y26-h26-d26)+0.080*(y27-h27-d27)+0.180*(y28-h28-d28)+0.350*(y29-h29-d29)+0.500*(y20-h20-d20)=y20,

s21..0.304*(y31-d31)=y31-38.28,
s22..0.124*(y31-d31)+0.118*(y32-d32)=y32-6.11,
s23..0.056*(y31-d31)+0.116*(y32-d32)+0.025*(y33-d33)=y33-1.46,
s24..0.027*(y31-d31)+0.100*(y32-d32)+0.049*(y33-d33)+0.003*(y34-h34-d34)=y34-0.41,
s25..0.014*(y31-d31)+0.086*(y32-d32)+0.080*(y33-d33)+0.013*(y34-h34-d34)+0.000*(y35-h35-d35)=y35-0.11,
s26..0.005*(y31-d31)+0.065*(y32-d32)+0.113*(y33-d33)+0.040*(y34-h34-d34)+0.004*(y35-h35-d35)+0.000*(y36-h36-d36)=y36-0.02,
s27..0.001*(y31-d31)+0.037*(y32-d32)+0.130*(y33-d33)+0.095*(y34-h34-d34)+0.022*(y35-h35-d35)+0.002*(y36-h36-d36)+0.000*(y37-h37-d37)=y37,
s28..0.011*(y32-d32)+0.101*(y33-d33)+0.167*(y34-h34-d34)+0.086*(y35-h35-d35)+0.022*(y36-h36-d36)+0.003*(y37-h37-d37)+0.000*(y38-h38-d38)=y38,
s29..0.034*(y33-d33)+0.162*(y34-h34-d34)+0.196*(y35-h35-d35)+0.111*(y36-h36-d36)+0.041*(y37-h37-d37)+0.011*(y38-h38-d38)+0.002*(y39-h39-d39)=y39,
s30..0.052*(y34-h34-d34)+0.223*(y35-h35-d35)+0.396*(y36-h36-d36)+0.487*(y37-h37-d37)+0.520*(y38-h38-d38)+0.530*(y39-h39-d39)+0.531*(y30-h30-d30)=y30,

s31..0.304*(y41-d41)=y41-5.02,
s32..0.153*(y41-d41)+0.210*(y42-d42)=y42-0.88,
s33..0.052*(y41-d41)+0.160*(y42-d42)+0.110*(y43-d43)=y43-0.15,
s34..0.016*(y41-d41)+0.090*(y42-d42)+0.140*(y43-d43)+0.040*(y44-h44-d44)=y44-0.03,
s35..0.005*(y41-d41)+0.040*(y42-d42)+0.120*(y43-d43)+0.080*(y44-h44-d44)+0.010*(y45-h45-d45)=y45-0.004,
s36..0.001*(y41-d41)+0.020*(y42-d42)+0.080*(y43-d43)+0.100*(y44-h44-d44)+0.030*(y45-h45-d45)+0.001*(y46-h46-d46)=y46,
s37..0.0002*(y41-d41)+0.010*(y42-d42)+0.050*(y43-d43)+0.100*(y44-h44-d44)+0.050*(y45-h45-d45)+0.006*(y46-h46)+0.000*(y47-h47-d47)=y47,
s38..0.00*(y42-d42)+0.030*(y43-d43)+0.100*(y44-h44-d44)+0.080*(y45-h45-d45)+0.016*(y46-h46-d46)+0.001*(y47-h47-d47)+0.000*(y48-y48-d48)=y48,
s39..0.010*(y43-d43)+0.07*(y44-h44-d44)+0.110*(y45-h45-d45)+0.039*(y46-h46-d46)+0.002*(y47-h47-d47)+0.000*(y48-h48-d48)+0.000*(y49-h49-d49)=y49,

```
s40..0.04*(y44-h44-d44)+0.240*(y45-h45-d45)+0.469*(y46-h46-d46)+0.528*(y47-h47-
d47)+0.531*(y48-h48-d48)+0.531*(y49-h49-d49)+0.500*(y40-h40-d40)=y40,

!Total values for the stand

!Basal area
s41..BAH1=0.018*h11+0.05*h12+0.097*h13+0.16*h14+0.238*h15
      +0.332*h16+0.442*h17+0.568*h18+0.709*h19+1.228*l10,
s42..BAH2=0.018*h21+0.05*h22+0.097*h23+0.16*h24+0.238*h25
      +0.332*h26+0.442*h27+0.568*h28+0.709*h29+1.228*l20,
s43..BAH3=0.018*h31+0.05*h32+0.097*h33+0.16*h34+0.238*h35
      +0.332*h36+0.442*h37+0.568*h38+0.709*h39+1.228*l30,
s44..BAH4=0.018*h41+0.05*h42+0.097*h43+0.16*h44+0.238*h45
      +0.332*h46+0.442*h47+0.568*h48+0.709*h49+1.228*l40,

s45..BAY1=0.018*y11+0.05*y12+0.097*y13+0.16*y14+0.238*y15
      +0.332*y16+0.442*y17+0.568*y18+0.709*y19+1.228*y10,
s46..BAY2=0.018*y21+0.05*y22+0.097*y23+0.16*y24+0.238*y25
      +0.332*y26+0.442*y27+0.568*y28+0.709*y29+1.228*y20,
s47..BAY3=0.018*y31+0.05*y32+0.097*y33+0.16*y34+0.238*y35
      +0.332*y36+0.442*y37+0.568*y38+0.709*y39+1.228*y30,
s48..BAY4=0.018*y41+0.05*
y42+0.097*y43+0.16*y44+0.238*y45
      +0.332*y46+0.442*y47+0.568*y48+0.709*y49+1.228*y40,

s49..BAH=BAH1+BAH2+BAH3+BAH4,
s50..BAY=BAY1+BAY2+BAY3+BAY4,
s51..BATOT=BAY,

!Numbers of trees
s52..NY1=y11+y12+y13+y14+y15+y16+y17+y18+y19+y10,
s53..NY2=y21+y22+y23+y24+y25+y26+y27+y28+y29+y20,
s54..NY3=y31+y32+y33+y34+y35+y36+y37+y38+y39+y30,
s55..NY4=y41+y42+y43+y44+y45+y46+y47+y48+y49+y40,

s56..NH1=h11+h12+h13+h14+h15+h16+h17+h18+h19+h10,
s57..NH2=h21+h22+h23+h24+h25+h26+h27+h28+h29+h20,
s58..NH3=h31+h32+h33+h34+h35+h36+h37+h38+h39+h30,
s59..NH4=h41+h42+h43+h44+h45+h46+h47+h48+h49+h40,

s60..NY=NY1+NY2+NY3+NY4,
s61..NH=NH1+NH2+NH3+NH4,

s62..NTOT=NY,

!resources limitation
s63..BATOT<=40,

!Basal Area removal
```

```
s64..BAH<=0.35*BATOT,

!Volume
s65..VH1=0.139*h11+0.439*h12+0.935*h13+1.64*h14+2.58*h15
      +3.76*h16+5.18*h17+6.87*h18+8.81*h19+16.33*h10,
s66..VH2=0.12*h21+0.38*h22+0.82*h23+1.448*h24+2.284*h25
      +3.337*h26+4.618*h27+6.135*h28+7.897*h29+14.723*h20,
s67..VH3=0.135*h31+0.414*h32+0.866*h33+1.504*h34+2.336*h35
      +3.372*h36+4.616*h37+6.077*h38+7.758*h39+14.174*h30,
s68..VH4=0.131*h41+0.415*h42+0.889*h43+1.571*h44+2.474*h45
      +3.611*h46+4.99*h47+6.628*h48+8.526*h49+15.87*h40,

s69..VH=VH1+VH2+VH3+VH4,


!Bon sens
s70..h14<=y14,
s71..h15<=y15,
s72..h16<=y16,
s73..h17<=y17,
s74..h18<=y18,
s75..h19<=y19,
s76..h10<=y10,
s77..h24<=y24,
s78..h25<=y25,
s79..h26<=y26,
s80..h27<=y27,
s81..h28<=y28,
s82..h29<=y29,
s83..h20<=y20,
s84..h34<=y34,
s85..h35<=y35,
S86..h36<=y36,
s87..h37<=y37,
s88..h38<=y38,
s89..h39<=y39,
s90..h30<=y30,
s91..h44<=y44,
s92..h45<=y45,
s93..h46<=y46,
s94..h47<=y47,
s95..h48<=y48,
s96..h49<=y49,
s97..h40<=y40,


!Damage

s98..DTOT>=3.6*NH,
```

s99..d1=d11+d12+d13+d14+d15+d16+d17+d18+d19+d10,
s100..d2=d21+d22+d23+d24+d25+d26+d27+d28+d29+d20,
s101..d3=d31+d32+d33+d34+d35+d36+d37+d38+d39+d30,
s102..d4=d41+d42+d43+d44+d45+d46+d47+d48+d49+d40,

s103..DTOT=d1+d2+d3+d4,
s104..d1>=0.015*DTOT,
s105..d2>=0.708*DTOT,
s106..d3>=0.245*DTOT,
s107..d4>=0.032*DTOT,

s108..d11>=d12,
s109..d12>=d13,
s110..d13>=d14,
s111..d14>=d15,
s112..d15>=d16,
s113..d16>=d17,
s114..d17>=d18,
s115..d18>=d19,
s142..d19>=d10,
s116..d21>=d22,
s117..d22>=d23,
s118..d23>=d24,
s119..d24>=d25,
s120..d25>=d26,
s121..d26>=d27,
s122..d27>=d28,
s123..d28>=d29,
s124..d29>=d20,
s125..d31>=d32,
s126..d32>=d33,
s127..d33>=d34,
s128..d34>=d35,
s129..d35>=d36,
s130..d36>=d37,
s131..d37>=d38,
s132..d38>=d39,
s133..d39>=d30,
s134..d41>=d42,
s135..d42>=d43,
s136..d43>=d44,
s137..d44>=d45,
s138..d45>=d46,
s139..d46>=d47,
s140..d47>=d48,
s141..d48>=d49,
s143..d49>=d40,

!Nature conservation: 100 ha

s150..y14-h14>=0.01,
s151..y15-h14>=0.01,
s152..y16-h16>=0.01,
s153..y17-h17>=0.01,
s154..y18-h18>=0.01,
s155..y19-h19>=0.01,
s156..Y10-h10>=0.01,

s157..Y24-h24>=0.01,
s158..Y25-h24>=0.01,
s159..Y26-h26>=0.01,
s160..Y27-h27>=0.01,
s161..Y28-h28>=0.01,
s162..Y29-h29>=0.01,
s163..Y20-h20>=0.01,

s164..Y34-h34>=0.01,
s165..Y35-h34>=0.01,
s166..Y36-h36>=0.01,
s167..Y37-h37>=0.01,
s168..Y38-h38>=0.01,
s169..Y39-h39>=0.01,
s170..Y30-h30>=0.01,

s171..Y44-h44>=0.01,
s172..Y45-h44>=0.01,
s173..Y46-h46>=0.01,
s174..Y47-h47>=0.01,
s175..Y48-h48>=0.01,
s176..Y49-h49>=0.01,
s177..Y40-h40>=0.01;

/*!Nature conservation: 50 ha

s150..y14-h14>=0.05,
s151..y15-h14>=0.05,
s152..y16-h16>=0.05,
s153..y17-h17>=0.05,
s154..y18-h18>=0.05,
s155..y19-h19>=0.05,
s156..Y10-h10>=0.05,

s157..Y24-h24>=0.05,
s158..Y25-h24>=0.05,
s159..Y26-h26>=0.05,

```
s160..Y27-h27>=0.05,
s161..Y28-h28>=0.05,
s162..Y29-h29>=0.05,
s163..Y20-h20>=0.05,

s164..Y34-h34>=0.05,
s165..Y35-h34>=0.05,
s166..Y36-h36>=0.05,
s167..Y37-h37>=0.05,
s168..Y38-h38>=0.05,
s169..Y39-h39>=0.05,
s170..Y30-h30>=0.05,

s171..Y44-h44>=0.05,
s172..Y45-h44>=0.05,
s173..Y46-h46>=0.05,
s174..Y47-h47>=0.05,
s175..Y48-h48>=0.05,
s176..Y49-h49>=0.05,
s177..Y40-h40>=0.05;*/

!Nature conservation: 10 ha

/*s150..y14-h14>=0.1,
s151..y15-h14>=0.1,
s152..y16-h16>=0.1,
s153..y17-h17>=0.1,
s154..y18-h18>=0.1,
s155..y19-h19>=0.1,
s156..Y10-h10>=0.1,

s157..Y24-h24>=0.1,
s158..Y25-h24>=0.1,
s159..Y26-h26>=0.1,
s160..Y27-h27>=0.1,
s161..Y28-h28>=0.1,
s162..Y29-h29>=0.1,
s163..Y20-h20>=0.1,

s163b..Y34-h34>=0.1,
s164..Y35-h34>=0.1,
s165..Y36-h36>=0.1,
s166..Y37-h37>=0.1,
s167..Y38-h38>=0.1,
s168..Y39-h39>=0.1,
s169..Y30-h30>=0.1,

s170..Y44-h44>=0.1,
s171..Y45-h44>=0.1,
```

```
s172..Y46-h46>=0.1,
s173..Y47-h47>=0.1,
s174..Y48-h48>=0.1,
s175..Y49-h49>=0.1,
s176..Y40-h40>=0.1;*/


/*!Local populations

!100%
s177..L10<=0.966*h10,
s178..L24<=0.966*h24,
s179..L25<=0.966*h25,
s180..L26<=0.966*h26,
s181..L27<=0.966*h27,
s182..L28<=0.966*h28,
s183..L29<=0.966*h29,
s184..L20<=0.966*h20,
s185..L30<=0.966*h30,
s186..L40<=0.966*h40;*/

! Maximization of STV
Model:
 STV
 maximize:

!Corrected prices

!Corrected 10%

!0.301*(0*h11+2.35*h12+11.75*h13+34.28*h14+77.56*h15+150.4*h16+262.65*h17+425.0
3*h18+604.79*h19+1410.66*h10
!+0*h21+0*h22+0*h23+0*h24+0*h25+6.62*h26+22.87*h27+52.03*h28+100.83*h29+258.
34*h20
!+0*h31+0*h32+1.14*h33+5.35*h34+16.09*h35+37.26*h36+73.50*h37+130.09*h38+214.
5*h39+487.8*h30
!+0.15*h41+6.1*h42+26.24*h43+71.27*h44+153.7*h45+287.64*h46+488.59*h47+772.93*
h48+1160.7*h49+2478.12*h40)

!+(0*h11+2.35*h12+11.75*h13+34.28*h14+77.56*h15+150.4*h16+262.65*h17+425.03*h1
8+604.79*h19+1410.66*h10
!+0*h21+0*h22+0*h23+0*h24+0*h25+6.62*h26+22.87*h27+52.03*h28+100.83*h29+258.
34*h20
!+0*h31+0*h32+1.14*h33+5.35*h34+16.09*h35+37.26*h36+73.50*h37+130.09*h38+214.
5*h39+487.8*h30
!+0.15*h41+6.1*h42+26.24*h43+71.27*h44+153.7*h45+287.64*h46+488.59*h47+772.93*
h48+1160.7*h49+2478.12*h40)
```

!-
(0*y11+2.35*y12+11.75*y13+34.28*y14+77.56*y15+150.4*y16+262.65*y17+425.03*y18+
604.79*y19+1410.66*y10
!+0*y21+0*y22+0*y23+0*y24+0*y25+6.62*y26+22.87*y27+52.03*y28+100.83*y29+258.3
4*y20
!+0*y31+0*y32+1.14*y33+5.35*y34+16.09*y35+37.26*y36+73.50*y37+130.09*y38+214.5
*y39+487.8*y30
!+0.15*y41+6.1*y42+26.24*y43+71.27*y44+153.7*y45+287.64*y46+488.59*y47+772.93*y
48+1160.7*y49+2478.12*y40)

!Correction 25%

!0.301*(5.158*h15+28.911*h16+80.975*h17+182.325*h18+365.929*h19+1010.306*h10
!+8.445*h29+107.544*h20
!+0.145*h37+30.140*h38+92.00*h39+h30
!+2.089*h43+13.092*h44+41.215*h45+101.577*h46+218.786*h47+431.864*h48+801.945*
h49+2111.846*h40)

!+(5.158*h15+28.911*h16+80.975*h17+182.325*h18+365.929*h19+1010.306*h10
!+8.445*h29+107.544*h20
!+0.145*h37+30.140*h38+92.00*h39+h30
!+2.089*h43+13.092*h44+41.215*h45+101.577*h46+218.786*h47+431.864*h48+801.945*
h49+2111.846*h40)

!-(5.158*y15+28.911*y16+80.975*y17+182.325*y18+365.929*y19+1010.306*y10
!+8.445*y29+107.544*y20
!+0.145*y37+30.140*y38+92.00*y39+h30
!+2.089*y43+13.092*h44+41.215*y45+101.577*y46+218.786*y47+431.864*y48+801.945*
y49+2111.846*y40)

!Correction 30%

0.301*(-1.06*h11-3.15*h12-5.82*h13-7.31*h14-
3.82*h15+12.194*h16+54.544*h17+147.653*h18+333.498*h19+1010.306*h10
-1.06*h21-3.54*h22-7.87*h23-14.09*h24-21.68*h25-29.12*h26-33.01*h27-
26.82*h28+1.383*h29+107.544*h20
-1.05*h31-3.31*h32-6.89*h33-11.37*h34-15.43*h35-16.30*h36-
8.52*h37+17.758*h38+79.789*h39+303.422*h30
-0.85*h41-2.06*h42-
2.09*h43+2.922*h44+20.767*h45+66.063*h46+165.083*h47+363.514*h48+739.335*h49+
2111.846*h40)

+(-1.06*h11-3.15*h12-5.82*h13-7.31*h14-
3.82*h15+12.194*h16+54.544*h17+147.653*h18+333.498*h19+1010.306*h10
-1.06*h21-3.54*h22-7.87*h23-14.09*h24-21.68*h25-29.12*h26-33.01*h27-
26.82*h28+1.383*h29+107.544*h20

-1.05*h31-3.31*h32-6.89*h33-11.37*h34-15.43*h35-16.30*h36-
8.52*h37+17.758*h38+79.789*h39+303.422*h30
-0.85*h41-2.06*h42-
2.09*h43+2.922*h44+20.767*h45+66.063*h46+165.083*h47+363.514*h48+739.335*h49+
2111.846*h40)

!-(-1.06*y11-3.15*y12-5.82*y13-7.31*y14-
3.82*y15+12.194*y16+54.544*y17+147.653*y18+333.498*y19+1010.306*y10
!-1.06*y21-3.54*y22-7.87*y23-14.09*y24-21.68*y25-29.12*y26-33.01*y27-
26.82*y28+1.383*y29+107.544*y20
!-1.05*y31-3.31*y32-6.89*y33-11.37*y34-15.43*y35-16.30*y36-
8.52*y37+17.758*y38+79.789*y39+303.422*y30
!-0.85*y41-2.06*y42-
2.09*y43+2.922*y44+20.767*y45+66.063*y46+165.083*y47+363.514*y48+739.335*y49+2
111.846*y40)

!Uncorrected prices

!0.061*(8.60*h11+27.160*h12+57.847*h13+101.711*h14+159.681*h15+232.438*h16+320.
60*h17+424.724*h18+545.305*h19+1010.304*h10
!+0.876*h21+2.783*h22+5.982*h23+10.576*h24+16.682*h25+24.373*h26+33.73*h27+44.
81*h28+57.680*h29+107.537*h20
!+2.890*h31+8.862*h32+18.538*h33+32.196*h34+50.01*h35+72.184*h36+98.815*h37+13
0.09*h38+166.76*h39+303.423*h30
!+17.432*h41+55.225*h42+118.301*h43+209.056*h44+329.220*h45+480.532*h46+664.42
8*h47+882.001*h48+1134.572*h49+2111.853*h40)

!+8.60*h11+27.160*h12+57.847*h13+101.711*h14+159.681*h15+232.438*h16+320.60*h1
7+424.724*h18+545.305*h19+1010.304*h10
!+0.876*h21+2.783*h22+5.982*h23+10.576*h24+16.682*h25+24.373*h26+33.73*h27+44.
81*h28+57.680*h29+107.537*h20
!+2.890*h31+8.862*h32+18.538*h33+32.196*h34+50.01*h35+72.184*h36+98.815*h37+13
0.09*h38+166.76*h39+303.423*h30
!+17.432*h41+55.225*h42+118.301*h43+209.056*h44+329.220*h45+480.532*h46+664.42
8*h47+882.001*h48+1134.572*h49+2111.853*h40

!-
(8.60*y11+27.160*y12+57.847*y13+101.711*y14+159.681*y15+232.438*y16+320.60*y17
+424.724*y18+545.305*y19+1010.304*y10
!+0.876*y21+2.783*y22+5.982*y23+10.576*y24+16.682*y25+24.373*y26+33.73*y27+44.8
1*y28+57.680*y29+107.537*y20
!+2.890*y31+8.862*y32+18.538*y33+32.196*y34+50.01*y35+72.184*y36+98.815*y37+13
0.09*y38+166.76*y39+303.423*y30
!+17.432*y41+55.225*y42+118.301*y43+209.056*y44+329.220*y45+480.532*y46+664.42
8*y47+882.001*y48+1134.572*y49+2111.853*y40)

```
Subject to:all
method:lp;
Solve STV;
```