Appendix - I

Data sheet for collecting field data on agroforestry area.

Name of the District	Name of the block: Name of the village: Altitudes:					
Plot no.: GPS location:	Agroforestry system	Tree species	GBH/DBH	Height	Crop species	Weeds/grass species

Appendix- II

Existing agroforestry systems and its components in Tehri district.

Villages	Blocks	Altitudes (m)	Agroforestry system	Tree species (Including fruit trees)	Crops	Weeds
Dungi	Devprayag	1200–2000	AS, AH	*Quercus leucotrichophora*A.Camus, *Grewia oppositifolia* Roxb., *Melia azedarach* L., *Rhododendron arboreum Sm., Celtis australis* L. *Toona ciliata* M. Roem.	*Echinochloa frumentacea* Link., *Zea mays* L, *Triticum aestivum* L	*Cynodon dactylon* , *Artimisia vulgaris, Datura metel*
Bagi	Devprayag	286–1200	AHS, AH, AS	*Adina cordifolia* (Roxb.) Hook.f, *Mangifera* indica L. *Citrus limon*Brum.	*Echinochloa frumentacea, Oryza sativa* L., *Cajanus spp.* (L.) Millsp.	*Agmaranthus virdis* Linn. *Artimisia vulgaris* L. *Cynodon dactylon* (L) Pers.
Langur	Devprayag	1200–2000	AS, AHS	*Grewia oppositifolia, Celtis australis, Pyrus communis* L., *Ficus roxburghii* Wall., *Prunus cerasoides*,D.Don	*Glycine max*, (L.) Merr. *Brassica campestris* L.**,** *Solanum melongena* L., *Colocasia antiquorum*L.	*Euphorbia hirta* , *Lantana camara*
Gorthi kanda	Devprayag	286–1200	AS, AHS	*Grewia oppositifolia, Anogeissus latifolia* (Roxb.ex DC) Wall.ex Bedd. *Melia azedarach,Psidium guajava* L.	*Vigna mungo* (L.)Hepper, *Cajanus cajan* (L.) Millsp	*Chenopodium album* L., *Datura metel* L.
Bachhen drikhal	Devprayag	286-1200	AS	*Grewia oppositifolia, Celtis australis, Ficus roxburghii*	*Glycine max, Brassica campestris* L., *Hordeum Vulgare* L.,	*Euphorbia hirta* L.., *Cynodon dactylon, Ageratum cenozoides.*L.
Palisen	Devprayag	286–1200	AS, AHS	*Grewia oppositifolia, Adina cordifolia, Morus alba, Rhus Parviflora* Roxb.	*Cajanus cajan,Penicum miliaceum* L.	*Cynodon dactylon,Parthenium hysterophours* L. *Lantana camara* L.
Jurana	Devprayag	2000–2800	AS	*Quercus leucotrichophora*	*Solanum tuberosum* L. *A.frumentacea*	*Cynodon dactylon,Parthenium hysterophours*
Timal gaon	Kritinagar	1200–2000	AS, AHS	*Grewia oppositifolia, Toona ciliata, Mangifera indica, Acacia caTBChu* (L.F.) Wild	*Amaranthus spinosus* L., *Glycine max, Zea mays, Coriander sativum* L.	*Carissa opaca,Datura metel*
Dagar	Kritinagar	1200–2000	AHS	*Melia azedarach, Citrus sinensis* (L.) Osbeck, *Prunus cerasoides, Juglans regia* L, *Toona ciliata*	*Echinichloa frumentacea, Vigna mungo* (L) Hepper.,*Curcuma longa*	*Ageratum conyzoides, Euphorbia hirta*
Maikhandi	Kritinagar	286–1200	AS, AHS	*Grewia oppositifolia, Toona ciliata, Celtis australis, Melia azedarach, Citrus limon* Brum. *Bauhinia variegata* (L.)Benth., *Ficus palmata*	*Curcuma longa, Vigna mungo, Echinochloa frumentacea, Eleusine coracana* (L.) Gatern	*Echinocloa crusgalli* (L) Beav*Lantana camara , Chinopodium album*
Riskoti	Kritinagar	1200–2000	AS, AHS	*Grewia oppositifolia, Ficus roxburghii, Prunus cerasoides, Bauhinia variegata, Celtis australis, Mangifera indica*	*Vigna mungo, Glycine max, Zea mays* L., *Amaranthus blitum* L. *Solanum tuberosum*	*Euphorbia hirta, Fragaria nubicola* Lindl.ex lacatia
Jakhand	Kritinagar	286–1200	AS, AHS	*Celtis australis, Toona ciliata, Grewia oppositifolia, Citrus limon, Psidium guajava, Celtis australis, Musa Paradisica* L.	*Vigna mungo, Glycine max, Zea mays, Amaranthus blitum , Hardeum vulgare* L.	*Berberis asiatica* Roxb.ex.dc, *Datura metel , Lantana camara*

Dhaulangi	Kritinagar	286–1200	AS, AHS	*Ficus roxburghii, Pinus roxburghii, Celtis australis, Toona ciliata, Melia azedarach, Musa Paradisica* L.	*Amaranthus blitum, Setaria italic* (L.)P.Beauv, *Sorghum vulgare*	*Lathyrus aphaca* L., *Lantana camara*
Kyari	Chamba	286–1200	AS, AHS	*Grewia oppositifolia, Celtis australis, Prunus cerasoides, Quercus leucotrichophora*	*Vigna mungo, Echinochloa frumentacea, Zea mays*	*Parthenium hysterophours , Euphorbia hirta, Cynodon dactylon*
Purshal	Chamba	1200–2000	AS, AHS	*Grewia oppositifolia, Celtis australis, Prunus cerasoides, Quercus leucotrichophora*	*Vigna mungo, Echinochloa frumentaacea, Zea mays,Solanum melongena L.*	*Euphorbia hirta, Lantana camara , Carissa opaca*
Chaupriyal Gaon	Chamba	2000–2800	AHS	*Quercus leucotrichophora, Malus domestica,* Borkh**.** *Citrus sinensis* Osbeck. *Pyrus communis* L.	*Solanum tuberosum* L., *A.frumentacea, F.esculentum* Mill.	*Carissa opaca, Cynodon dactylone*
Pali	Chamba	286–1200	AHS	*Juglans regia, Prunus armeniaca* L., *Prunus persica* Batsch.	*Allium cepa* L., *Capasicum annun* L., *Zingiber officinale* Roxb.	*Carissa opaca, Canabis sativa* L.
Guldi	Chamba	286–1200	AHS	*Celtis australis, Grewia oppositifolia, Ficus palmata, Morus alba*	*Vigna mungo, Zea mays, Solanum melongena* L.	*Ageratum conyzoides, Carissa opaca*
Saur	Chamba	2000–2800	AHS	*Malus domestica, Myrica esculenta,*Buch.-Ham, *Juglans regia*	*Solanum tuberosum, A.frumentacea, F.esculentum*	*Cynodon dactylon,Parthenium hysterophours*
Dharwal	Thauldhar	286–1200	AHS, AS	*Grewia oppositifolia, Ficus roxburghii, Bauhinia variegata, Melia azedarach*	*Echinochloa frumentacea, Glycine max, Cyclenthera pedata* (L.) Schrad.	*Euphorbia hirta, Lantana camara*
Jaspur	Thauldhar	286–1200	AS	*Grewia oppositifolia, Pinus roxburghii, Pyrus pashia,* Buch.-Ham. Ex D. Don**.,***Woodfordia fruticosa* (L.) Kurz	*Brassica campestris, Colocasia antiquorum* Schott., *Macrotyloma uniflorum* (Lam.) Verdc.	*Amaranths virdis* Linn., *Chenopodium album, Fragaria nubicola*
Indra	Thauldhar	1200–2000	AS	*Melia azedarach, Celtis australis, Albizia lebbeck,* L.,	*Vigna mungo, Zea mays, Amaranthus blitum*	*Datura metel , Lantana camara*
Sonara	Thauldhar	1200–2000	AS	*Pinus roxburghii, Celtis australis, Albizia lebbeck*	*Vigna mungo, Zea mays, Glycine max, Amaranthus spinsous*	*Amaranthus virdis, Chenopodium album, Fragaria nubicola*
Raswari	Jakhnidhar	286–1200	AS	*Pyrus pashia, Celtis australis, Grewia oppositifolia, Melia azedarach, Prunus cerasoides*	*Glycine max, Amaranthus spinosus, Zea mays*	*Parthenium hysterophours , Euphorbia hirta, Cynodon dactylon*
Undoli	Jakhnidhar	286–1200	AS	*Melia azedarach, Ficus auriculata, Celtis australis*	*Triticum aestivum , Lense esculenta* L.	*Chenopodium album , Cynodon dactylone*
Manthal	Jakhnidhar	1200–2000	AS,AH	*Grewia oppositifolia, Melia azedarach, Celtis australis, Psidium guajava* L. *Citrus lemon* L.	*Amarenthus blitum, Trichosanthes anguina* L, *Zingiber officinale* Roxb.	*Parthenium hysterophours , Euphorbia hirta, Lantana camara*
Chah	Jakhnidhar	1200–2000	AS, AH	*Grewia oppositifolia, Celtis australis, Psidium Guajava* L.	*Amaranthus blitum , Coriander sativum* L.	*Chenopodium album , Cynodon dactylone, Lantana camara*
Kaulgarh	Pratapnagar	2000–2800	AS, AHS, AS	*Grewia oppositifolia, Malus domestica, Juglans regia, Prunus persica*	*Solanum tuberosum, A.frumentacea, F.esculentum*	*Cynodon dactylon,Parthenium hysterophours, Carissa opaca*

Banali	Pratap nagar	2000-2800	AS	*Grewia oppositifolia, Pyrus pashia, Melia azedarach*	*Solanum tuberosum, A.frumentacea*	*Parthenium hysterophours, Carissa opaca*
Kotagha	Pratap nagar	1200–2000	AS	*Grewia oppositifolia, Pyrus pashia, Melia azedarach*	*Vigna mungo, Zea mays, Amaranthus blitum, Oryza sativa*	*Euphorbia hirta, Lantana camara, cynodon dactylon*
Kandakhal	Pratap nagar	1200-2000	AS	*Grewia oppositifolia, Melia azedarach*	*Sorghum vulgare, Triticum aestivum* L. *Eleusine coracana*	*Amaranthus virdis , Chenopodium album, Lantana Camara*
Baunsari	Pratap nagar	286–1200	AS	*Grewia oppositifolia, Pyrus pashia, Melia azedarach*	*Fagopyrum esculentum* Mill. *Hardeum vulgare* L.	*Amaranthus virdis , Chenopodium album, Lantana Camara*

Abbreviations are:AS = Agrisilviculture system, AHS = Agrihortisilvicultre system, AH = Agrihorticulture system.

Appendix - III

Density (individual/100 m^2) of trees, crops and weeds in agroforestry systems along altitudes.

S.No.	Species	Local name	Family	Agroforestry System		
Tree species				AS	AHS	AH
1	*Adina cardifolia* (Roxb.) Hook.f	Haldu	Rubiaceae	0.6 (L)		
2	*Albizia leeback (*Linn.) Benth.	Siris	Fabaceae	0.8(L)		
3	*Anogeissus latifolia* (Roxb.ex DC.) Wall.ex Bedd.	Dhaura	Combrateace	0.6(L)		
4	*Acacia catechu* (L.F.)Wild	Khair			0.8 (L)	
5	*Bahunia verigata* L. Benth.	Kachnar	Caesalpiniaceae	0.5 (L)		
6	*Bombax ceiba* L.	semal	Bombacaceae	0.8 (L)		
7	*Celtis australis* L.	Kharik	Ulmaceae	4.0 (L) 3.2 (M)	4.1 (L) 2.5 (M)	
8	*Ficus palamata* Forssk.	Bedu	Moraceae	1.1(L)		
9	*Ficus roxburghii* Wall.	Timla	Moraceae	1.0 (L) 4.5 (M)	2.4 (M)	
10	*Ficus semicordata* Buch-Ham.ex Sm.	Khaina	Moraceae	0.6 (L)		
11	*Grewia oppositifolia* Roxb.	Bhimal	Tiliaceae	6.0 (L) 7.7 (M), 4.0 (U)	5.5 (L) 9.0 (M) 1.8(U)	
12	*Hoplia integrifolia* L.	papri		0.5 (L)	1.0 (L)	
13	*Melia azedirach* L.	Dekkain	Meliaceae	2.0 (L) 1.5 (M)	2.2 (L)	
14	*Myrica esculenta* Buch.-Ham.	Kaphal	Myricaceae	3.5 (U)	3.2 (U)	
15	*Morus alba* L.	Sahtoot	Moraceae	0.5(L) 1.1 (M)	1.0 (L)	
16	*Pinus roxburghii* Sargent.	Chir	Pinaceae	0.7(L) 0.6 (M)		
17	*Prunus cerasoides* D.Don	Paiyana	Rosaceae	0.6 (L)		
18	*Pyrus pashia Buch.*-Ham.ex D.Don	Mole	Rosaceae	0.8 (L)	0.9(L)	
19	*Quercus leucotrichophora* A.Camus	Banj	Fagaceae	5.8(U)1.5(M)	1.7 (M) 5.1(U)	
20	*Rhododendron arboreum* Sm.	Burans	Ericaceae	1.9(U)	1.9(U)	
21	*Rhus parviflora* Roxb.	Tungla	Anacardiaceae	0.4 (L) 0.5(M)		
22	*Toona ciliata* M.Roem.	Tun	Meliaceae	0.5 (L) 0. 6(M)	0.8(L)	
23	*Woodfordia fruticosa* (L.) Kurz	Dhaula	Lythraceae	0.3 (L) 0.4(M)		
Fruit species						
1	*Carica papaya* L.	Papeeta	Caricaceae		0.7(L)	2.4(L)
2	*Citrus aurentium* L.	Narangi	Rutaceae		0.5(M) 0.5 (U)	2.2(L) 1.4(M)
3	*Citrus limon* Brum.	Nimbu	Rutaceae		2.1(U)	2.5 (L) 1.4(M)
4	*Citrus sinensis* Osbeck.	Malta	Rutaceae		1.0(M), 2.5(U)	4.2(U)3.5(M)
5	*Embilica officinalis* Gaertn.	Aonla	Euphorbiaceae		1.5 (L) 0.5(M)	1.8(M)
6	*Juglanse regia* L.	Akhrot	Juglandaceae		1.7(U)	1.2 (U)
7	*Malus domestica* Borkh.	Apple	Rosaceae		2.8(U)	3.2(U)
8	*Mangifera indica* L.	Aam	Anacardiaceae		1.5 (L) 1.3(M)	6.7(L) 3.5(M)
9	*Musa paradisiacia* L.	Kela	Musaceae		1.5(M)	3.4(L) 2.3(M)
10	*Prunus armenica* L.	Chullu	Musaceae		1.2(M)	1.3(U)
11	*Prunus persica* Batsch.	Aadu	Rosaceae		0.5 (L),0.7(M)	2.2(U)2.3(M)
12	*Psidium guajava* L.	Amrud	Rosaceae		1.0 (L)	1.7(L) 1.2(M)
13	*Punica granatum* L.	Anar	Myrtaceae		0.6(L) 0.3(M)	2.2(L) 1.2(M)
14	*Pyrus communis* L.	Naspati	Punicaceae		1.6(U)	2.9(M) 1.6(U)
Agricultural crop species						
1	*Amarnathus blitum* L.	Chaulai	Amaranthaceae	752(M) 570 (U)		132(U)
2	*Ehinochloa frumentacea* Link	Jhangora (barnyard Millet)	Poaceae	145(L)256(M) 215(U)	267 (L)	264(M)
3	*Eleusine coracana* (L.) Gatern	Koda (Finger millet)	Poaceae	430(U)		
4	*Fagopyrum esculentum* Mill.	Ogal (Buckwheat)	Polygonaceae	350(U)	254(M)	

5	*Hordeum vulagare* L.	Jau (barley)	Poaceae	345 (L)		
6	*Oryza sativa* L.	Dhan/Satti	Poaceae	70 (L) 130(M)	375(L)269(M)	
7	*Panicum miliaceum* L.	Chenna (Hog millet)	Poaceae	255(M)		
8	*Setaria italic* (L.)P.Beauv	Kauni (Foxtail millet)	Poaceae	145(M)		
9	*Sorghum vulgare* L.	Millets	Poaceae	128(L)255(M)		
10	*Triticum aestivum* L.	Gheun	Poaceae	470 (L) 340(M)		
11	*Zea mays* L.	Makai	Poaceae	132(L)		
Leguminous crop species						
1	*Cajanus spp.* (L.) Millsp.	Tor (Pigeon pea)	Fabaceae	145(L) 222(M)	240(L)	
2	*Cicer arientinum* L.	Chana (Gram)	Fabaceae	123(L), 221(M)	135 (L)	
3	*Glycine max* (L.) Merr.	Soyabean	Fabaceae		132(L)	145(M)
5	*Lens esculenta* L.	Masoor	Fabaceae	123(L)		
6	*Pisum sativum* L.	Matar	Fabaceae	345(L)		187(M)
9	*Macrotyloma uniflorum* (Lam.) Verdc.	Gahat (Horse gram)	Fabaceae	245(L)		
10	*Vigna* mungo (L.) Hepper	Kalidal/Urd	Fabaceae	189 (L)		
Other crop species (Oil, vegetables and rhizomatous eTBC)						
1	*Cyclanthera pedata* (L.) Schrad.	Kokora	Cucurbitaceae	122(M)	186(M)	
2	*Abelmoschus esculentus* L. Moench.	Bhindi	Malvaceae	232(L) 132(M)	175 (L)172(M)	
3	*Allium cepa* L.	Onion	Amaryllidaceae	175 (L) 265(M)		134(L) 196(M)
4	*Allium sativum* L.	Garlic	Amaryllidaceae	132 (L) 265(M)	143(L) 276(M)	
5	*Brassica compestris* L.	Sarson	Brassicaceae	145(L) 275(M)		230(L) 265(M)
6	*Brassica juncea* L.	Rai	Brassicaceae	135 (L)175(M)		133(L) 256(M)
7	*Capsicum annuum* L.	Mirchi	Solanaceae	260 (L) 242(M)		860(L) 124(M)
8	*Colocasia antiquorum* Schott.	Arvi	Araceae	135 (L)		276(L)186(M)
9	*Cucumis sativus* L. vari. Momodica	Kakari	Cucurbitaceae	146 (M)	276 (M)	
10	*Curcuma longa* L.	Turmeric	Zingiberaceae	245 (L) 276(M)	164 (U)	222(M)
11	*Luffa acutangula* Roxb.	Tore (Ridge gourd)	Cucurbitaceae	254 (M) 250 (L)	364(L) 232(M)	
12	*Luffa cylindrica* Roem.	Tore (sponge gourd)	Cucurbitaceae	386(M)175(L)		
13	*Lageenaria sicraria* stand L.	Tomato	Solanaceae	375(L)	242(M)	
14	*Raphanus sativus* L.	Muli	Brasicaceae	132(L) 232(M)	142(L) 231(M)	
15	*Sesamum indicum* L.	Til	Pedaliaceae	275(L) 125(M)	250 (L) 275(M)	
16	*Solanum melongena* L.	Baigun	Solanaceae	145(L) 225(M)	160 (L) 134(M)	115(U)
17	*Solanum tuberosum* L.	Potato	Solanaceae	275(M) 145(L) 125(U)	235(U)	375(U) 221(M) 126(L)
18	*Zingiber officinale* Roxb.	Adrak	Zingiberaceae			175(L) 177(M)
19	*Spinacia oleracea* L.	Palak	Chenopodiaceae			230(L)) 176(M)
Weed and grass species						
1	*Ageratum conyzoides* L.	Goat weed	Asteraceae	123 (L) 167(M)	120(L) 175(M)	
2	*Amarantus viridis* Linn.	Jungli chaulai	Amaranthaceae	103 (L)	445 (L) 256 (M)	
3	*Artimisia vulgaris* L.	Kunja	Asteraceae	142 (L) 256(M)	129(L) 156(U)176(M)	
4	*Berberis asiatica* Roxb.ex.dc	Kingora	Berberidaceae	156 (L) 265(M)	232(M) 275(L)	
5	*Cannabis sativa* L.	Bhang	Cannabaceae	176 (L) 165(M)		
6	*Carissa opaca* L.	Karonda	Apocyanceae	145 (L) 456(M)	132(U)	72(L) 82(U)82(M)
7	*Chenopodium album* L.	Bathua	Chenopodiaceae	185 (L) 196(M)	143 (L) 232(M)	
8	*Cynodon dactylon* (L.)Pers.	Boob	Poaceae	275 (L) 267(M)	135(M)156(L)	167(U)
9	*Datura metel* L.	Kanko		175(L)		
10	*Euphorbia hirta* L.	Dudhi	Euphorbiaceae	124 (L) 186(M) 156(U)		

11	*Echinocloa crusgalli* (L) Beav	Banyard grass		490(L)		
12	*Fragaria nubicola* Lindl.ex Lacatia	Wild strawberry	Rosasceae		142 (L) 176(M)	
13	*Lantana camara* L.	Kuri-ghas	Verbenaceae	170 (L) 178(M) 267(U)	142(L) 186(M)	157(L) 143(M)
14	*Parthenium hysterophours* L.	Gajar-ghas	Papaveraceae	174(L) 146(U)	83 (L)65 (M)	165 (U)

Abbreviations are:AS = Agrisilviculture system, AHS = Agrihortisilvicultre system, AH = Agrihorticulture system; L = Lower altitude, M = Middle altitude, U = Upper altitude

Appendix –IV

Biomass carbon stock (kg ha^{-1}) contributed by agroforestry species in systems along altitudes

S. No.	species	Agroforestry systems			
	Tree species		**AS**	**AHS**	**AH**
1	*Adina cardifolia* (Roxb.) Hook.f	AGB	218.6±87.0(L)		
		BGB	54.6±21.7(L)		
		TB	273.2±108.7(L)		
		TBC	122.9±48.9(L)		
2	*Albizia leeback* (Linn.) Benth.	AGB	56.7 ±12.1(L)		
		BGB	14.1±3.0(L)		
		TB	70.8±15.1(L)		
		TBC	31.9±6.80(L)		
3	*Anogeissus latifolia* (Roxb.ex DC.) Wall.ex Bedd.)	AGB	33.2±6.40(L)		
		BGB	8.30±1.60(L)		
		TB	41.5±8.5(L)		
		TBC	18.6±3.6(L)		
4	*Acacia caTBChu* (L.F.)Wild	AGB	117±48.6(L)	242.96±34.12(L)	
		BGB	29.2±12.1(L)	60.624±8.49(L)	
		TB	146.3±60.7 (L)	303.12±42.62(L)	
		TBC	65.8±27.3(L)	136.36±19.15(L)	
5	*Bahunia verigata* (L.)Benth	AGB	132.5±5.28(L)		
		BGB	33.1±13.2(L)		
		TB	165.6±66.0(L)		
		TBC	41.4±16.5(L)		
6	*Bombax ceiba* (L.)	AGB	151.1±69.5 (L)		
		BGB	37.7±17.3(L)		
		TB	188.9±86.9(L)		
		TBC	85.0±39.1(L)		
7	*Celtis australis* (L.)	AGB	280.1±58.0(L)	773.85± 66.52(L)	
			1155±287.28 (M)	307.87±35.30(M)	
		BGB	70.1± 14.5(L)	193.39±16.56 (L)	
			288.72±71,64(M)	76.82±8.82(M)	
		TB	350±72.5(L)	967.39±83.08(L)	
			1445±359.28(M)	384.50±44.13(M)	
		TBC	157.5± 32.62(L)	435.31±37.44 (L)	
			650.16 ± 161.64(M)	173.53±19.78(M)	
8	*Ficus palamata* Forssk.	AGB	189.8±40.3(L)		
		BGB	47.4±10.0(L)		
		TB	237.2±50.4(L)		
		TBC	106.7±22.6(L)		

9	*Ficus roxburghii* Wall.	AGB	444.7 ±38.3 (L)	363.55±29.48 (M)	
			424.44±115.2(M)		
		BGB	111.1±9.5(L)	90.88±8.24(M)	
			105.84±28.8(M)		
		TB	555.9±47.9(L)	454.44±41.22(M)	
			530.64±144.0(M)		
		TBC	250.1±21.5(L)	204.47±18.52(M)	
			238.68±64.8(M)		
10	*Ficus semicordata* Buch-Ham.ex Sm.	AGB	72.77±6.11(L)		
		BGB	18.01±1.527(L)		
		TB	90.9±6.87(L)		
		TBC	40.9±3.09(L)		
11	*Grewia oppositifolia* Roxb.	AGB	497.3±35.4 ((L)	843.264 ±72.576 (L)	
			1349.64±148.32(M)	418.55±83.22(M)	
			36.22± 6.28(U)	41.36±3.94(U)	
		BGB	124.3±8.8(L)	210.81±18.14(L)	
			337.32±37.08(M)	104.56±20.75(M)	
			9.05±1.56(U)	10.34±0.98(U)	
		TB	621.6±44.2(L)	1054.22±90.72(L)	
			1686.96±185.76(M)	523.60±104.81(M	
			45.28±7.86(U)	51.71±4.92(U)	
		TBC	279.7±19.9 (L)	693.36±98.64 (L)	
			759.24±83.52(M)	235.41±46.85(M)	
			20.37±3.53(U)	23.26±2.21(H)	
12	*Holoptelea integrifolia* Planch.	AGB	99.1±34 (L)	224.06±63.93(L)	
		BGB	24.7±8.7(L)	56.73±15.98(L)	
		TB	123.8±43.7(L)	283.82±79.92(L)	
		TBC	55.7±19.6(L)	127.58±35.85(L)	
13	*Melia azedirach* (L.)	AGB	185.0±60.4(L)	746.20 ±114.76 (L)	
			183.24±120.6(M)		
		BGB	83.2±27.2(L)	335.80±51.55 (L)	
			45.72±15.48(M)		
		TB	266.3±87.0(L)	1082.44±166.46(L)	
			228.96±150.84(M)		
		TBC	120.7±39.4(L)	487.00±74.88(L)	
			102.96±67.68(M)		
14.	*Myrica esculenta* Buch.-Ham	AGB	21.80±12.*81*(U)	48.96±6.15 (U)	
		BGB	5.44±3.20(U)	12.24±1.53(U)	
		TB	27.26±16.01(U)	61.20±7.69(U)	
		TBC	12.26±7.21(U)	27.54±3.46(U)	

15.	*Morus alba* (L.)	AGB	51.1±41.4(L)	209.37±52.848(L)	
		BGB	12.7±10.3(L)	52.848±13.10(L)	
		TB	63.8±51.8(L)	261.79±66.09L)	
		TBC	28.7±23.3(L)	126.86±29.66(L)	
16.	*Pinus roxburghii* Sargent	AGB	130.1±31.8(L)		
		BGB	32.5±7.9(L)		
		TB	162.6±39.8(L)		
		TBC	73.2±17.9(L)		
17.	*Prunus cerasoides* D.Don	AGB	150.2±55.9(L)		
		BGB	37.5±13.9(L)		
		TB	187.8±69.9(L)		
		TBC	84.5±31.4(L)		
18.	*Pyrus pashia Buch.*-Ham.ex D.Don	AGB	124.1±60.0(L)	214.56±68.4(L)	
			17.57±6.57(M)		
		BGB	31.0±15.0(L)	53.56±16.92(L)	
			4.39±1.64(M)		
		TB	15.51±7.50(L)	268.27±85.53(L)	
			21.9±8.21(M)		
		TBC	69.8±33.7(L)	120.67±38.44(L)	
			9.88±3.69(M)		
19.	*Qurecus leucotrichophora* A.Camus	AGB	1792±106.96(U)	2229.67±157.04 (M)	
				91.36±6.32(U)	
		BGB	448.19±26.74(U)	557.37±39.18 (M)	
				22.84±1.58(H)	
		TB	2241.57±133.7 (U)	2787.14±196.23 (M)	
				114.21±7.91(H)	
		TBC	1008±60.077(U)	1254.13±88.27(M)	
				51.39±3.56(U)	
20.	*Wood fructicosa*(L.) Kurz	AGB	58.4±27.6(L)		
		BGB	14.6±6.9(L)		
		TB	73.0±34.5(L)		
		TBC	32.8±15.5(L)		
21.	*Toona cilata* M.Roem	AGB	111.1±38.9(L)	240.91±29.23(L)	
		BGB	27.7±0.97(L)	60.12±7.2(L)	
		TB	138.9±48.6(L)	290.73±36.57(L)	
		TBC	69.4±24.3(L)	135.50±16.41(L)	
22.	*Rhododendron arboreum* Sm.	AGB	37.88±12.47(U)		
		BGB	9.64±3.11(U)		
		TB	43.37±15.59 (U)		
		TBC	21.31±7.01(U)		
23.	*Rhus parviflora*Roxb	AGB	115.1±2.39(L)		

		BGB	28.7±5.9(L)		
		TB	143.9±29.9(L)		
		TBC	64.7±13.4(L)		
Fruit species					
1.	*Carica papaya* L. .	AGB		116.35±35.42(L)	79.78 ± 47.79(L)
		BGB		29.23±8.78(L)	19.84±11.88(L)
		TB		145.44±44.35(L)	99.63±59.63(L)
		TBC		65.376±19.87(L)	44.82±23.76(L)
2.	*Citrus aurentium* L.	AGB		108.14±19.29(L)	
				168.39±50.53(M)	
				9.59±3.50(U)	
		BGB		41.80±7.63(L)	
				41.80±12.61(M)	
				2.39±0.87(U)	
		TB		135.07±24.19(L)	
				210.49±63.14(M)	
				11.99±4.38(U)	
		TBC		60.76±10.8(L)	
				94.67±28.42(M)	
				13.98±5.31(U)	
3.	*Citrus limon* Brum.	AGB			339.01±214.89(L)
					847.11±360.36(M)
		BGB			84.68±53.65(L)
					211.86±90.09(M)
		TB			423.98±268.54(L)
					659.67±76.23(M)
		TBC			190.53±120.64 (L)
					296.34±34.32(M)
4.	*Citrus sinensis* Osbeck.	AGB		201.66±63.30(U)	321.399±37.18(U)
				81.57±30.949(M)	211.53±107.25(M)
		BGB		50.34±15.77(U)	80.19±9.24(U)
				20.37±7.66(M)	52.8±26.73(M)
		TB		252±79.07(U)	401.79±46.43(U)
				101.94±38.6(M)	264.66 ±134.31(M)
		TBC		113.4±35.5(U)	296.34 ± 34.32(U)
				45.86±17.37(M)	72.56 ± 36.78(M)
5.	*Embilica officinalis* Gaertn.	AGB		189.21±50.11 (L)	356.07±194.37 (M)
				107.088±16.49(M)	

		BGB		47.23±12.52(L)	88.77±48.51 (M)
				26.77±4.07(M)	
		TB		236.59±63.62(L)	445.17±242.88(M)
				133.86±20.56(M)	
		TBC		106.41±28.08(L)	200.31±109.23(M)
				60.23±9.21(M)	
6.	*Juglans regia* L.	AGB		352.31±104.07(U)	441.99±160.59(U)
		BGB		12.93±12.54(U)	110.34±39.99(U)
		TB		365.34±107.99(U)	552.34±200.59(U)
		TBC		164.346±47.62(U)	337.07±90.24(U)
7.	*Malus domestica* Borkh.	AGB		147.01±63.7(U)	480.99±91.85(U)
		BGB		36.75±15.87(U)	119.59±22.91(U)
		TB		183.75±79.57(U)	561.79±598.77(U)
		TBC		35.77±0.88(U)	269.34±51.65(U)
8.	*Mangifera indica* .L	AGB		256.32±33.12(L)	490.1±165.3(L)
		BGB		64.08±8.20(L)	122.38±41.18(L)
		TB		320.54±41.47(L)	615.09±206.77(L)
		TBC		354.67±38.16(L)	275.5±93.09(L)
9.	*Musa paradisica* L.	AGB		62.85±34.536(M)	375.84±206.48(L)
		BGB		15.71±8.827(M)	217.47±120.12(M)
		TB		78.57±44.23(M)	94.25±6.38(L)
		TBC		35.30±19.88(M)	54.12±30.03(M)
					470.09±212.86(L)
					271.59±150.15(M)
					211.41±95.57(L)
					122.1±67.32(M)
10.	*Prunus armenica* L.	AGB		227.66±116.64(L)	173.262 ± 65.12 (U)
				61.98±30.84(M)	
		BGB		56.88±29.08(L)	43.21 ±16.28(U)
				15.42±7.66(M)	
		TB		284.54±145.87(L)	216.47 ±81.40 (U)
				77.50±38.60(M)	
		TBC		128.01±65.66(L)	97.48 ±36.58(U)
				34.82±17.36(M)	
11.	*Pyrus communis* L.	AGB		145.72±46.35(U)	385.41±55.1(L)
					333.33±85.47(M)
					105.12±18.89(U)
		BGB		36.35±11.56(U)	96.28±13.63(L)
					149.99±38.46(M)
					43.21±16.28(U)

		TB		182.18±57.91(U)	481.69±69.02(L)
					483.32±17.30(M)
					216.47±81.40(U)
		TBC		81.92±26.06 (U)	261.63±31.03(L)
					217.49±48.18(M)
					97.48±36.58(U)
12.	*Punica granatum* L.	AGB			151.38±49.3(L)
		BGB			68.15±21.75(L)
		TB			219.53 ±69.6(L)
		TBC			98.6±32.19(L)
13.	*Psidium guajava* L.	AGB		37.00±12.67(L)	156.02±27.36(L)
		BGB		9.21±3.16(L)	38.86±6.67(L)
		TB		46.22±15.84(L)	195.17±34.22(L)
		TBC		20.73±7.05(L)	87.87±15.37(L)
14.	*Prunus armenica* L.	AGB		227.66±116.64(L)	
		BGB		56.88±29.08(L)	
		TB		284.54±145.87(L)	
		TBC		128.01±65.66(L)	
15.	*Prunus persica* Batsch	AGB		206.20±93.6(L)	399.62±75.69(L)
		BGB		51.5±23.32(L)	99.76±18.85(L)
		TB		257.76±116.92(L)	499.67±94.54(L)
		TBC		122.4±52.56 (L)	224.75±42.34 (L)
Agricultural Crop species					
1.	*Amarnathus blitum* L.	TB	110.82±97.18(U)	156.2± 7.48(U)	
			19.12± 0.52(M)		
		TBC	49.78±43.64(U)	69.96±3.08(U)	
			8.55±0.22(M)		
2.	*Ehinochloa frumentacea* Link	TB	12.85±0.45(L)	19.94±1.30(L)	24.05±1.98(M)
			24.9±0.9(M)		
			115.94±3.06(U)		
		TBC	5.76±0.20 (L)	8.93±1.96(L)	10.79±8.91(M)
			11.17±0.37(M)		
			52.17±1.36(U)		
3.	*Eleusine coracana* (L.)Gatern	TB	18.05±1.58 (L)		
		TBC	8.10±0.71(L)		
4.	*Fagopyrum esculentum* Mill.	TB	92.07± 6.13(U)	34.68±1.41(M)	
		TBC	41.26±2.72(U)	16.63±0.56(M)	
5.	*Hordeum vulagare* L.	TB	11.47±9.53(L)		
		TBC	5.15±4.28(L)		
6.	*Oryza sativa* L.	TB	16.01±0.61 (L)	12.42±0.21 (L)	
			5.1±0.15(M)	8.17±0.14(M)	

		TBC	7.91±0.25 (L)	15.36±0.54 (L)	
			2.25±0.67(M)	4.23±0.12(M)	
7.	*Panicum miliaceum* L.	TB	10.91±0.30(L)		15.85±0.69(L)
		TBC	4.89±0.05(L)		21.18±10.39(M)
8.	*Setaria italica* L. P.Beauv	TB	16.06±0.86(L)		7.09±0.27(L)
		TBC	7.91±0.051 (L)		9.50±4.65(M)
9.	*Sorghum vulgare* L.	TB	8.16±1.07(L)		
		TBC	3.62±0.459(L)		
10.	*Triticum aestivum* L.	TB	14.53±0.20(L)		
			19.2±0.3(M)		
		TBC	6.52±0.15(L)		
			8.62±0.07(M)		
11.	*Zea mays* L	TB	13.26±1.58(L)		
		TBC	5.96±0.71(L)		
Leguminous crop species					
1.	*Cajanus spp.* (L.) Millsp	TB	13.51±0.86(L)	18.85±1.63(L)	
			17.25±0.9(M)		
		TBC	6.06±0.25(L)	8.39±0.65(L)	
			7.72±0.37(M)		
2.	*Cicer arientinum* L	TB		27.46±1.41(L)	6.63±0.29(M)
		TBC		12.31±0.54(L)	2.97±0.099(M)
3.	*Glycine max* (L.) Merr.	TB		33.±0.15(L)	
		TBC		14.93±0.76(L)	
4.	*Lens esculenta* L	TB	0.35±0.01(L)		
		TBC	0.10±0.005(L)		
5.	*Pisum sativum* L.	TB	11.37±0.71 (L)		12.17±0.69(M)
		TBC	5.1±0.03(L)		9.9±0.29(M)
		TB	13.46±0.81 (L)		
		TBC	6.01±0.40(L)		
7.	*Vigna mungo* (L.) Hepper	TB	12.34±0.81(L)		
		TBC	5.50±0.40(L)		
Other crop species (Oil, vegetables and rhizomatous crops)					
1.	*Cyclanthera pedata* (L.)Schrad.	TB	7.66±2.48 (M)	17.90±1.83 (M)	
		TBC	4.48±0.66(L)	7.65±3.67 (L)	
			3.45±1.12 (M)	8.03±0.70 (M)	
2.	*Allium cepa* L	TB	2.65±0.05 (L)		42.84±2.08(L)
			22.27±1.05(M)		5.14±0.099(M)
		TBC	1.17±0.025(L)		19.27±0.93(L)
			9.97±0.45(M)		2.277±0.19(M)
3.	*Allium sativum* L.	TB	2.54 ±0.27 (L)	35.42±2.94(L)	
			16.95±0.9 (M)	29.61±1.833(M)	

		TBC	5.61±0.61(L)	15.91±1.30 (L)	
			7.57±0.37 (M)	12.69±0.70 (M)	
4.	*Brassica compestris* L.	TB	10.60 ±0.357(L)		56.75±4.86(L)
			22.95±1.12(M)		20.19±1.68(M)
		TBC	4.74±0.15 (L)		24.45±2.08(L)
			10.27±0.52(M)		4.45±0.69(M)
5.	*Brassica juncea* L.	TB	6.47±0.66 (L)		28.37±2.36(L)
			13.72±1.57(M)		30.19±1.38(M)
		TBC	2.9±0.25(L)		12.65±0.97(L)
			6.3±0.67(M)		13.5±0.29(M)
6.	*Capsicum annuum* L.	TB	6.63±0.255 (L)		31.29±3.47(L)
					11.08±1.18(M)
		TBC	2.95±0.30 (L)		14.04±1.53(L)
7.	*Colocasia antiquorum* Schott.	TB	6.57±0.35(L)	21.90±0.87(L)	4.95±0.59(M)
				28.90±0.98(M)	
		TBC	2.95±0.15 (L)	9.91±0.32(L)	2.22±0.26(M)
				12.97±0.42(M)	
8.	*Cucumis sativus* L. Vari. *Momodica*	TB	6.98±0.71 (L)	17.98±0.98(L)	
				14.24±0.01(M)	
		TBC	3.11±0.30(L)	8.06±0.43(L)	
				6.34±0.005(M)	
9	*Curcuma longa* L.	TB	14.94±0.56(L)	112.2±3.96(U)	4.75±0.09(M)
		TBC	6.68±0.20 (L)	50.16±1.76 (U)	2.07±0.03(M)
10.	*Lagenaria siceraria* Standl	TB	5.45±0.30 (L)	34.13±2.8(M)	
		TBC	2.44±0.10(L)	15.36±1.26(M)	
11.	*Luffa acutangula* Roxb.	TB	10.86±0.61(L)	20.16±0.011(L)	
			15.22±1.2(M)	28.34±0.28(M)	
		TBC	4.85±0.25 (L)	9.04±0.43(L)	
			7.57±0.6 (M)	4.23±0.12(M)	
12.	*Luffa cylindrica* Roem .	TB	1.07±0.056(L)	18.53+1.96 (L)	
			16.57±1.57 (M)	21.99±3.52 (M)	
		TBC	2.44±0.10 (L)	8.17±0.87 (L)	
			7.42±0.67(M)	9.94±1.55 (M)	
13.	*Raphanus sativus* L.	TB	15.50±0.71 (L)		22.5±10.15(L)
			11.77±1.42 (M)		19.40±8.71(M)
		TBC	6.98±0.71 (L)		10.12±4.56(L)
			5.25±0.6(M)		8.71±0.79(M)
14.	*Sesamum indicum* L.	TB	12.85±1.68 (L)	20.38±1.30 (L)	
			11.77±5.32 (M)	29.18±2.67 (M)	
		TBC	5.76±0.71(L)	9.15±0.54 (L)	
			5.25±052 (M)	13.11±1.12 (M)	
15.	*Solanum melongena* L.	TB	15.45±0.96 (L)	22.89±1.74 (L)	44.94±34.24(U)
			10.5±0.75 (M)	16.21±2.11 (M)	
		TBC	6.93±0.40 (L)	10.24±0.76 (L)	20.22±15.40(U)

			4.72±0.3 (M)	8.03±0.84(M)	
16.	*Solanum tuberosum* L.	TB	15.60±1.27 (L)	185.68±22(U)	9.59±0.41(L)
			21.7±0.67(M)		19.10±1.38(M)
			34.44±9.54 (U)		22.57±2.67(U)
		TBC	6.98±0.56 (L)	83.16±9.68(U)	4.31±0.13(L)
			9.75±0.3 (M)		8.51±0.59(M)
			15.34±3.41 (U)		10.27±1.17(U)
17.	*Zingiber officinalis* Roxb.	TB	6.93±1.42 (L)		19.19±1.66(L)
			9.37±1.5(M)		10.19±1.18(M)
		TBC	3.11±0.61(L)		6.25±1.39(L)
			0.56±0.09(M)		4.55±0.49(M)
18.	*Spinacia oleracea* L.	TB	5.81±1.47(L)		31.71±8.06(L)
			19.65±1.8(M)		41.97±4.75(M)
		TBC	2.60±0.66 (L)		14.18±3.61(L)
			8.775±0.75 (M)		23.36±1.98(M)
Weeds and grass species					
1.	*Ageratum conyzoides* L.	TB	6.52±0.56 (L)	3.05±0.08 (L)	21.82±5.56(U)
			7.65±0.75(M)	45.68±0.05(M)	
		TBC	2.93±0.25(L)	1.37±0.03(L)	9.73±2.46(U)
			3.44±0.33(M)	20.55±0.01 (M)	
2.	*Amarantus viridis* Linn.	TB	12.08±5.66 (L)	13.95±0.87 (L)	
			17.25±7.8 (M)	31.58±4.08(M)	
		TBC	5.43±2.54(L)	6.27±0.39(L)	
			7.76±3.51(M)	14.21±1.83(M)	
3.	*Artimisia vulgaris.* L.	TB	7.75±1.68 (L)	16.89± 0.08(L)	33.17±0.17(U)
			4.27±0.52 (M)	29.6± 2.53(M)	
				8.43±0.04(U)	
		TBC	3.48±0.75(L)	7.60±0.03(L)	14.87±0.04(U)
				13.32±1.13(M)	
			1.92±0.23(M)	3.79±0.01(U)	
4.	*Berberis asiatica* Roxb.ex.dc	TB	10.40±0.20(L)	16.89± 0.007(L)	
			4.27±0.67 (M)	29.6± 1.12 (M)	
		TBC	4.68±0.09(L)	7.60±0.003(L)	
			1.92±0.04(M)	13.32±0.50(M)	
5.	*Cannabis sativa* L.	TB	13.00± 0.45(L)		
			45.75± 8.85 (M)		
		TBC	7.34± 0.20 (L)		
			22.87±3.37 (M)		
6.	*Carissa opaca* L.	TB	1.887±0.0151(L)	84.56±9.68(U)	14.04±0.13(L)
			2.25±0.07 (M)		7.52±0.019(M)
			11.93±3.41 (U)		10.16±1.17(U)
		TBC	0.84±0.004(L)	37.84±3.96(U)	6.31±0.05(L)
			1.01±0.03(M)		3.38±0.004(M)
			5.36±1.53(U)		4.57±0.52(U)

7.	*Chenopodium album* L.	TB	5.76±0.05(L)	14.71±0.01(L)	28.89±0.214(U)
			7.72±0.01(M)	13.24±0.014(M)	
		TBC	2.59±0.02(L)	6.61±0.004(L)	12.94±0.85(U)
			3.47±0.04(M)	5.95±0.006(M)	
8.	*Cynodon dactylon* (L.) Pers.	TB	6.42±0.40(L)	27.9±8.17(L)	54.78±16.50(U)
			7.8±0.007 (M)	17.90±1.83 (M)	
		TBC	2.88±0.18(L)	12.55±3.67(L)	24.65±7.42(U)
			3.51±0.03(M)	8.05±0.82(M)	
9.	*Datura metel* (L) Beav.	TB	7.85 ±0.35 (L)	24.52±0.21(L)	
			9.45±0.15 (M)	14.24±0.14(M)	
		TBC	3.53±0.15(L)	10.91±0.09 (L)	
			4.25±0.06(M)	6.40±0.04(M)	
10.	*Euphorbia hirta* L.	TB	83.88±43.64(U)		2.37±0.57(L)
			3.26±0.20(L)		27.71±0.74(U)
			16.05±0.22(M)		
		TBC	37.74±19.63(U)		1.06±0.25(L)
			1.46±0.09(L)		12.41±0.32(U)
			7.22±0.04(M)		
11.	*Fragaria nubicola* Lindl.ex Lacatia	TB	10.55±0.28(L)	28.39+1.92 (L)	
			9.07±1.57 (M)	36.09±3.52 (M)	
		TBC	4.74±0.12(L)	12.77±0.86 (L)	
			4.08±0.70(M)	16.24±1.46 (M)	
12.	*Lantana camara* L.	TB	11.57±0.66 (L)		1.04±0.17(L)
			6.22±1.57(M)		2.05±0.14(M)
		TBC	5.20±2.97 (L)		0.46±0.07(L)
			2.79±0.70 (M)		0.92±0.06(M)
13.	*Parthenium hysterophours* L.	TB	10.55±0.28 (L)	29.43+1.96(L)	57.78±3.85(U)
			9.07±1.57 (M)	7.89±3.52 (M)	
		TBC	4.74±0.12 (L)	13.24±0.88(L)	26.00±1.71(U)
			4.08±0.70(M)	3.55±1.46 (M)	

Abbreviations are: AS = Agrisilvicultural system; AHS = Agrihortisilvicultral system; AH = Agrihorticultural system; L = Lower altitude; M = Middle altitude; U = Upper altitude; AGB = above ground biomass; BGB= below ground biomass; TB=Total biomass; TBC=Total biomass carbon.

Appendix - V

Effect of variation of tree density on altitudes

	Mean tree density /ha	Significance	CD
Altitudes (m)	286 – 1200 1200 – 2000 2000 – 2800 220.0 195.0 177.2	(P ≤ 0.01)**	11.05

** indicates significance at the level of probability of 0.01%

Effect of variation of tree density on agroforestry systems

	Mean tree density/ha	Significance	CD
Agroforestry systems	Agri – Horti Agri – Horti-Silvi Agri – Silvi 181.6 211.7 198.9	(P ≤ 0.01)**	11.05

* *indicates significance at the level of probability of 0.01%

Interaction effect of tree density on agroforestry systems and altitudes

Parameter	DF	Type III SS	Mean square	F	$P_r > F$
Density	4	9092.59	2273.14	1.603	0.174

Interaction effect of ABG between altitudes and systems

Parameter	DF	Type III SS	Mean square	F	$P_r > F$
ABG	4	10.807	0.169	1.197	0.312

Interaction effect of interaction between altitudes and systems

Parameter	DF	Type III SS	Mean square	F	$P_r > F$
BGB	4	0.675	0.169	1.197	0.312

Interaction effect of total tree biomass between altitudes and systems

Parameter	DF	Type III SS	Mean square	F	$P_r > F$
Total tree biomass	4	16.875	4.222	1.197	0.312

Interaction effect of crop biomass between altitudes and systems

Parameter	DF	Type III SS	Mean square	F	P_r>F
Crop biomass	4	2.321	0.580	6.934	0.000*

* indicates significant at 5% level

Interaction effect of total biomasswith altitudes and systems

Parameter	DF	Type III SS	Mean square	F	P_r>F
Total biomass	4	25.577	6.394	1.739	0.142

Effect of variation of biomass carbon stock on altitudes

	Mean biomass carbon stock (ton ha^{-1})	Significance	CD
Altitudes (m)	286 – 1200 1200 – 2000 2000 – 2800 2.06 1.60 1.20	(P ≤ 0.01)**	0.261

**indicates significance at the level of probability of 0.01%

Effect of variation of biomass carbon stock on agroforestry system

	Mean biomass carbon stock (ton ha^{-1})	Significance	CD
Systems	Agri – Horti Agri – Horti-Silvi Agri – Silvi 1.21 2.18 1.48	(P ≤ 0.01)**	0.261

**indicates significance at the level of probability of 0.01%

Interaction effect of biomass carbon stock between altitude and system

Parameter	DF	Type III SS	Mean square	F	P_r > F
Biomass carbon stock	4	5.179	1.295	1.739	0.142

Effect of variation of CO_2 mitigation on altitudes

	Mean CO_2 mitigation (ton C ha^{-1})	Significance	CD
Altitudes (m)	286 – 1200 1200 – 2000 2000 – 2800 7.55 5.88 4.40	(P ≤ 0.01)**	0.959

** indicates significance at the level of probability of 0.01%

Effect of variation of CO_2 mitigation on agroforestry systems

	Mean CO_2 mitigation (ton C ha^{-1})	Significance	CD
Agro forestry systems	Agri – Horti Agri – Horti-Silvi Agri – Silvi 4.43 7.98 5.42	(P ≤ 0.01) **	0.959

** indicates significance at the level of probability of 0.01%

Interaction effect of CO_2 mitigation with altitudes and systems

Parameter	DF	Type III SS	Mean square	F	P_r>F
CO_2 mitigation	4	69.76	17.440	1.739	0.142

Appendix – VI

Botanical name, local name, family and uses of different agroforestry species in district

S.No.	Species	Local name	Family	Uses
Tree species				
1	*Adina cordifolia* (Roxb.) Hook. f	Haldu	Rubiaceae	Medicinal, Timber
2	*Albizia leeback* (Linn.) Benth.	Siris	Fabaceae	Medicinal
3	*Anogeissus latifolia* (Roxb.ex DC.) Wall.ex Bedd.	Dhaura	Combrateace	Fuel, Timber
4	*Acacia catechu* (L.F.)Wild	Khair		Medicinal
5	*Bahunia verigata* L. Benth.	Kachnar	Caesalpiniaceae	Fodder, Fuel, Timber, Medicine
6	*Bombax ceiba* L.	Semal	Bombacaceae	Fodder, Fuel, Timber, Medicine
7	*Celtis australis* L.	Kharik	Ulmaceae	Fodder
8	*Ficus palamata* Forssk.	Bedu	Moraceae	Fodder
9	*Ficus roxburghii* Wall.	Timla	Moraceae	Fodder, Fuel, Fruit
10	*Ficus semicordata* Buch-Ham.ex Sm.	Khaina	Moraceae	
11	*Grewia oppositifolia* Roxb.	Bhimal	Tiliaceae	Fodder, Fibre, Fuel
12	*Holoptelea integrifolia* Panch.	Papri	Fabaceae	Medicinal
13	*Melia azedirach* L.	Dekkain	Meliaceae	Fuel, Timber, Fodder
14	*Myrica esculenta* Buch.-Ham.	Kaphal	Myricaceae	Fuel, Fruit, Timber
15	*Morus alba* L.	Sahtoot	Moraceae	Fodder, Fruit, Fiber, Medicine, Fuel
16	*Pinus roxburghii Sargent*.	Chir	Pinaceae	Timber, Fuel
17	*Prunus cerasoides* D.Don	Paiyana	Rosaceae	Fuel, Timber
18	*Pyrus pashia Buch.*-Ham.ex D.Don	Mole	Rosaceae	Edible Fruit
19	*Quercus leucotrichophora* A.Camus	Banj	Fagaceae	Fodder, Fuel, Timber
20	*Rhododendron arboreum* Sm.	Burans	Ericaceae	Fuel, Fruit
21	*Rhus parviflora* Roxb.	Tungla	Anacardiaceae	Fruits, Fuel, Medicine
22	*Toona ciliata* M.Roem.	Tun	Meliaceae	Fuel, Timber
23	*Woodfordia fruticosa* (L.) Kurz	Dhaula	Lythraceae	Fodder, Fuel
Fruit trees				
1	*Carica papaya* L.	Papeeta	Caricaceae	Edible fruit
2	*Citrus aurentium* L.	Narangi	Rutaceae	Edible fruit
3	*Citrus limon* Brum.	Nimbu	Rutaceae	Edible fruit
4	*Citrus sinensis* Osbeck.	Malta	Rutaceae	Edible fruit
5	*Embilica officinalis* Gaertn.	Aonla	Euphorbiaceae	Edible friut
6	*Juglanse regia* L.	Akhrot	Juglandaceae	Edible friut
7	*Malus domestica* Borkh.	Apple	Rosaceae	Edible fruit
8	*Mangifera indica* L.	Aam	Anacardiaceae	Edible fruit, timber, worship
9	*Musa paradisiacia* L.	Kela	Musaceae	Edible fruit, worship
10	*Prunus armenica* L.	Chullu	Musaceae	Edible fruit
11	*Prunus persica* Batsch.	Aadu	Rosaceae	Edible fruit
12	*Psidium guajava* L.	Amrud	Rosaceae	Edible fruit
13	*Punica granatum* L.	Anar	Myrtaceae	Edible fruit
14	*Pyrus communis* L.	Naspati	Punicaceae	Edible fruit
Agriculture crop species				
1	*Amarnathus blitum* L.	Chaulai	Amaranthaceae	
2	*Ehinochloa frumentacea* Link	Jhangora (barnyard Millet)	Poaceae	Edible
3	*Eleusine coracana* (L.) Gatern	Koda (Finger millet)	Poaceae	Edible
4	*Fagopyrum esculentum* Mill.	Ogal (Buckwheat)	Polygonaceae	Edible
5	*Hordeum vulagare* L.	Jau (barley)	Poaceae	Edible
6	*Oryza sativa* L.	Dhan/Satti	Poaceae	Edible
7	*Panicum miliaceum* L.	Chenna (Hog millet)	Poaceae	Edible
8	*Setaria italic* (L.)P.Beauv	Kauni (Foxtail millet)	Poaceae	Edible
9	*Sorghum vulgare* L.	Millets	Poaceae	Edible
10	*Triticum aestivum* L.	Gheun	Poaceae	Edible
11	*Zea mays* L.	Makai	Poaceae	Edible
Leguminous crop species				
1	*Cajanus spp*. (L.) Millsp.	Tor (Pigeon pea)	Fabaceae	Edible
2	*Cicer arientinum* L.	Chana (Gram)	Fabaceae	Edible
3	*Glycine max* (L.) Merr.	Soyabean	Fabaceae	Edible
5	*Lens esculenta* L.	Masoor	Fabaceae	Edible
6	*Pisum sativum* L.	Matar	Fabaceae	Edible
9	*Macrotyloma uniflorum* (Lam.) Verdc.	Gahat	Fabaceae	Edible

		(Horse gram)		
10	*Vigna* mungo (L.) Hepper	Kalidal/Urd	Fabaceae	Edible
Other crop species (Oil, vegetables and rhizomatous)				
1	*Cyclanthera pedata* (L.) Schrad.	Kokora	Cucurbitaceae	Edible
2	*Abelmoschus esculentus* L. Moench.	Bhindi	Malvaceae	Edible
3	*Allium cepa* L.	Onion	Amaryllidaceae	Edible
4	*Allium sativum* L.	Garlic	Amaryllidaceae	Edible,
5	*Brassica compestris* L.	Sarson	Brassicaceae	Edible
6	*Brassica juncea* L.	Rai	Brassicaceae	Edible
7	*Capsicum annuum* L.	Mirchi	Solanaceae	Edible
8	*Colocasia antiquorum* Schott.	Arvi	Araceae	Edible
9	*Cucumis sativus* L. vari. Momodica	Kakari	Cucurbitaceae	Edible
10	*Curcuma longa* L.	Turmeric	Zingiberaceae	Edible
11	*Luffa acutangula* Roxb.	Tore (Ridge gourd)	Cucurbitaceae	Edible
12	*Luffa cylindrica* Roem	Tore(sponge gourd)	Cucurbitaceae	Edible
13	*Lageenaria sicraria* stand L.	Tomato	Solanaceae	Edible
14	*Raphanus sativus* L.	Muli	Brasicaceae	Edible
15	*Sesamum indicum* L.	Til	Pedaliaceae	Edible
16	*Solanum melongena* L.	Baigun	Solanaceae	Edible
17	*Solanum tuberosum* L.	Potato	Solanaceae	Edible
18	*Zingiber officinale* Roxb.	Adrak	Zingiberaceae	Edible
19	*Spinacia oleracea* L.	Palak	Chenopodiaceae	Edible
Weed and grass species				
1	*Ageratum conyzoides* L.	Goat weed	Asteraceae	Medicine
2	*Amarantus viridis* Linn.	Jungli chaulai	Amaranthaceae	Vegetable
3	*Artimisia vulgaris* L.	Kunja	Asteraceae	Medicine
4	*Berberis asiatica* Roxb.ex.dc	Kingora	Berberidaceae	Fruit, dye
5	*Cannabis sativa* L.	Bhang	Cannabaceae	Fuel, Fiber
6	*Carissa opaca* L.	Karonda	Apocyanceae	Fodder, fruit
7	*Chenopodium album* L.	Bathua	Chenopodiaceae	In making bread from grined grain
8	*Cynodon dactylon* (L.)Pers.	Doob	Poaceae	Worship
9	*Datura metel* L.	Kanko		Meddicinal
10	*Euphorbia hirta* L.	Dudhi	Euphorbiaceae	Meadicinal
11	*Echinocloa crusgalli* (L) Beav	Banyard grass	Poaceae	Fodder
12	*Fragaria nubicola* Lindl.ex Lacatia	Wild strawberry	Rosasceae	Fruit, local bevarages
13	*Lantana camara* L.	Kuri-ghas	Verbenaceae	Fuel, Skin ailments, Soil binder
14	*Parthenium hysterophours* L.	Gajar-ghas	Papaveraceae	Fuel