

Supplementary material – Tela et al

Appendix 1: The relationship between maize crop yield, bird abundance and distance across the three treatments (birds + insect excluded from crops, birds only excluded from crops and crops accessible to birds) across 20 farmlands

Parameters	Estimate	SE	<i>t</i>	<i>p</i>
(Intercept)	271.45	124.18	2.19	0.032
insectivorous birds	-1.92	8.15	-0.24	0.815
Birds excluded	62.20	52.67	1.18	0.241
Open access	528.88	52.67	10.040	<0.001

Insect and birds excluded is set as the intercept. Significant p-values is given in bold

Appendix 2: Bird list

Habitats	Common names	Family name	Scientific name	TFG	Foraging strata
Farmland	Green Crombec	Macrospenidae	<i>Sylvietta virens</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland	Chubb's Cisticola	Cisticolidae	<i>Cisticola chubbi</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland	Scarlet-chested Sunbird	Nectariniidae	<i>Chalcomitra senegalensis</i>	nectarivores	aerial foliage gleaner (midstory)
Farmland	Blue-breasted kingfisher	Alcedinidae	<i>Halcyon malimbica</i>	pisces	midstory foraging
Farmland	Woodland Kingfisher	Alcedinidae	<i>Halcyon senegalensis</i>	pisces	midstory foraging
Farmland	Streaky-headed Seedeater	Fringillidae	<i>Crithagra gularis</i>	granivores	midstory/understory
Farmland	Brown-crowned Tchagra	Malaconotidae	<i>Tchagra australis</i>	insectivorous	understory (ground foraging)
Farmland	Village Indigobird	Viduidae	<i>Vidua chalybeata</i>	insectivorous	understory (ground foraging)
Farmland	White-rumped Swift	Apodidae	<i>Apus caffer</i>	insectivorous	upper story (upper strata)
Farmland and forest fragments	Grey-headed Nigrita	Estrildidae	<i>Nigrita canicapillus</i>	granivores	aerial foliage gleaner (mid-story/understory)
Farmland and forest fragments	African Moustached Grass-warbler	Macrospenidae	<i>Melocichla mentalis</i>	insectivorous	aerial foliage gleaner (mid-story/understory)
Farmland and forest fragments	Garden Warbler	Sylviidae	<i>Sylvia borin</i>	insectivorous	aerial foliage gleaner (mid-story/understory)
Farmland and forest fragments	Pin-tailed Whydah	Viduidae	<i>Vidua macroura</i>	granivores	aerial foliage gleaner (mid-story/understory)
Farmland and forest fragments	Sedge Warbler	Acrocephalidae	<i>Acrocephalus schoenobaenus</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Oriole Warbler	Cisticolidae	<i>Hypergerus atriceps</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Northern Crombec	Macrospenidae	<i>Sylvietta brachyura</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	African Blue-flycatcher	Monarchidae	<i>Elminia longicauda</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	European Pied Flycatcher	Muscicapidae	<i>Ficedula hypoleuca</i>	insectivorous	aerial foliage gleaner (midstory)

Farmland and forest fragments	Northern Black-flycatcher	Muscicapidae	<i>Melaenomis edolioides</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Green-headed Sunbird	Nectariniidae	<i>Cyanomitra verticalis</i>	nectarivores	aerial foliage gleaner (midstory)
Farmland and forest fragments	Green Woodhoopoe	Phoeniculidae	<i>Phoeniculus purpureus</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Willow Warbler	Phylloscopidae	<i>Phylloscopus trochilus</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	African Shrike-flycatcher	Vangidae	<i>Megabyas flammulatus</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Grey Apalis	Cisticolidae	<i>Apalis cinerea</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Grey-backed (Bleating) Camaroptera	Cisticolidae	<i>Camaroptera brachyura</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Marsh Tchagra	Malaconotidae	<i>Bocagia minuta</i>	insectivorous	aerial foliage gleaner (midstory)
Farmland and forest fragments	Orange-tufted Sunbird	Nectariniidae	<i>Cinnyris bouvieri</i>	nectarivores	aerial foliage gleaner (midstory)
Farmland and forest fragments	Splendid Sunbird	Nectariniidae	<i>Cinnyris coccinigastrus</i>	nectarivores	aerial foliage gleaner (midstory)
Farmland and forest fragments	Copper Sunbird	Nectariniidae	<i>Cinnyris cupreus</i>	nectarivores	aerial foliage gleaner (midstory)
Farmland and forest fragments	Northern Doubled-collared Sunbird	Nectariniidae	<i>Cinnyris reichenowi</i>	nectarivores	aerial foliage gleaner (midstory)
Farmland and forest fragments	Variable Sunbird	Nectariniidae	<i>Cinnyris venustus</i>	nectarivores	aerial foliage gleaner (midstory)
Farmland and forest fragments	Yellow-throated Greenbul	Pycnonotidae	<i>Atimastillas flavicollis</i>	frugivores	aerial foliage gleaner (midstory)
Farmland and forest fragments	Grey-headed Kingfisher	Alcedinidae	<i>Halcyon leucocephala</i>	pisces	midstory foraging
Farmland and forest fragments	African Pygmy-kingfisher	Alcedinidae	<i>Ispidina picta</i>	pisces	midstory foraging
Farmland and forest fragments	Senegal Eremomela	Cisticolidae	<i>Eremomela pusilla</i>	insectivorous	midstory foraging
Farmland and forest fragments	Tawny-flanked Prinia	Cisticolidae	<i>Prinia subflava</i>	insectivorous	midstory foraging
Farmland and forest fragments	Speckled Mousebird	Coliidae	<i>Colius striatus</i>	frugivores	midstory foraging

Farmland and forest fragments	Yellow-rumped Tinkerbird	Lybiidae	<i>Pogoniulus bilineatus</i>	frugivores	midstory foraging
Farmland and forest fragments	Western Green Thinkerbird	Lybiidae	<i>Pogoniulus coryphaea</i>	frugivores	midstory foraging
Farmland and forest fragments	Doubled-toothed Barbet	Lybiidae	<i>Pogonornis bidentatus</i>	frugivores	midstory foraging
Farmland and forest fragments	Little Bee-eater	Meropidae	<i>Merops pusillus</i>	insectivorous	midstory foraging
Farmland and forest fragments	African Paradise-flycatcher	Monarchidae	<i>Terpsiphone viridis</i>	insectivorous	midstory foraging
Farmland and forest fragments	Grey Woodpecker	Picidae	<i>Dendropicos goertae</i>	insectivorous	midstory foraging
Farmland and forest fragments	Brown-throated Wattle-eye	Platysteiridae	<i>Platysteira cyanea</i>	insectivorous	midstory foraging
Farmland and forest fragments	Yellow Bishop	Ploceidae	<i>Euplectes capensis</i>	granivores	midstory foraging
Farmland and forest fragments	Singing Cisticola	Cisticolidae	<i>Cisticola cantans</i>	granivores	midstory/understory
Farmland and forest fragments	Short-winged Cisticola	Cisticolidae	<i>Cisticola brachypterus</i>	insectivorous	midstory/understory
Farmland and forest fragments	Pectoral-patch Cisticola	Cisticolidae	<i>Cisticola brunnescens</i>	insectivorous	midstory/understory
Farmland and forest fragments	Red-faced Cisticola	Cisticolidae	<i>Cisticola erythrops</i>	insectivorous	midstory/understory
Farmland and forest fragments	Zitting Cisticola	Cisticolidae	<i>Cisticola juncidis</i>	insectivorous	midstory/understory
Farmland and forest fragments	Whistling Cisticola	Cisticolidae	<i>Cisticola lateralis</i>	insectivorous	midstory/understory
Farmland and forest fragments	Croaking cisticola	Cisticolidae	<i>Cisticola natalensis</i>	insectivorous	midstory/understory
Farmland and forest fragments	Red eyed Dove	Columbidae	<i>Streptopelia semitorquata</i>	frugivores	midstory/understory
Farmland and forest fragments	Vinaceous Dove	Columbidae	<i>Streptopelia vinacea</i>	frugivores	midstory/understory
Farmland and forest fragments	Blue-spotted Wood-dove	Columbidae	<i>Turtur afer</i>	frugivores	midstory/understory
Farmland and forest fragments	Tambourine Dove	Columbidae	<i>Turtur tympanistria</i>	frugivores	midstory/understory
Farmland and forest fragments	Senegal Coucal	Cuculidae	<i>Centropus senegalensis</i>	insectivorous	midstory/understory

Farmland and forest fragments	Orange-cheeked Waxbill	Estrildidae	<i>Estrilda melpoda</i>	granivores	midstory/understory
Farmland and forest fragments	Black-crowned Waxbill	Estrildidae	<i>Estrilda nonnula</i>	granivores	midstory/understory
Farmland and forest fragments	Black-bellied Firefinch	Estrildidae	<i>Lagonosticta rara</i>	granivores	midstory/understory
Farmland and forest fragments	Bar-breasted Firefinch	Estrildidae	<i>Lagonosticta rufopicta</i>	granivores	midstory/understory
Farmland and forest fragments	Bronze mannikin	Estrildidae	<i>Spermestes cucullata</i>	granivores	midstory/understory
Farmland and forest fragments	Tropical Boubou	Malaconotidae	<i>Laniarius aethiopicus</i>	frugivores	midstory/understory
Farmland and forest fragments	Yellow-breasted Boubou	Malaconotidae	<i>Laniarius atroflavus</i>	frugivores	midstory/understory
Farmland and forest fragments	Snowy-Crowned Robin-chat	Muscicapidae	<i>Cossypha niveicapilla</i>	insectivorous	midstory/understory
Farmland and forest fragments	Familiar Chat	Muscicapidae	<i>Oenanthe familiaris</i>	insectivorous	midstory/understory
Farmland and forest fragments	Baglafecht Weaver	Ploceidae	<i>Ploceus baglafecht</i>	granivores	midstory/understory
Farmland and forest fragments	Bannerman's Weaver	Ploceidae	<i>Ploceus bannermani</i>	granivores	midstory/understory
Farmland and forest fragments	Dark-backed Weaver	Ploceidae	<i>Ploceus bicolor</i>	granivores	midstory/understory
Farmland and forest fragments	Village Weaver	Ploceidae	<i>Ploceus cucullatus</i>	granivores	midstory/understory
Farmland and forest fragments	Black-billed Weaver	Ploceidae	<i>Ploceus melanogaster</i>	granivores	midstory/understory
Farmland and forest fragments	Viellot's Black Weaver	Ploceidae	<i>Ploceus nigerrimus</i>	granivores	midstory/understory
Farmland and forest fragments	Spectacled Weaver	Ploceidae	<i>Ploceus ocularis</i>	granivores	midstory/understory
Farmland and forest fragments	Common Bulbul	Pycnonotidae	<i>Pyconotus barbatus</i>	generalist	midstory/understory
Farmland and forest fragments	Whinchat	Turdidae	<i>Saxicola rubetra</i>	insectivorous	midstory/understory
Farmland and forest fragments	African Green-pigeon	Columbidae	<i>Treron calvus</i>	frugivores	midstory/uppper story
Farmland and forest fragments	Square-tailed Drongo	Dicruridae	<i>Dicrurus ludwigii</i>	insectivorous	midstory/uppper story

Farmland and forest fragments	White-crested Turaco	Musophagidae	<i>Tauraco leucolophus</i>	frugivores	midstory/uppper story
Farmland and forest fragments	Yellow-billed Turaco	Musophagidae	<i>Tauraco macrorhynchus</i>	frugivores	midstory/uppper story
Farmland and forest fragments	Green Turaco	Musophagidae	<i>Tauraco persa</i>	frugivores	midstory/uppper story
Farmland and forest fragments	Rufous-naped Lark	Alaudidae	<i>Mirafrja africana</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Wattled Lapwing	Charadriidae	<i>Venellus senegallus</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	White-chinned Prinia	Cisticolidae	<i>Schistolais leucopogon</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Cinnamon-breasted Bunting	Emberizidae	<i>Emberiza tahapisi</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Brown-rumped Bunting	Emberizidae	<i>Emberiza affinis</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Brown Twinspot	Estrildidae	<i>Clytospiza monteiri</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Yellow-winged Pytilia	Estrildidae	<i>Pytilia hypogrammica</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Red-cheeked Cordon-blue	Estrildidae	<i>Uraeginthus bengalus</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Yellow-fronted Canary	Fringillidae	<i>Crithagra mozambica</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Black-crowned Tchagra	Malaconotidae	<i>Tchagra senegalus</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	African Pipit	Motacillidae	<i>Anthus cinnamomeus</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Plain-backed Pipit	Motacillidae	<i>Anthus leucophrys</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Tree Pipit	Motacillidae	<i>Anthus trivialis</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Yellow-throated Longclaw	Motacillidae	<i>Macronyx croceus</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Sooty Chat	Muscicapidae	<i>Myrmecocichla nigra</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Common (African) Stonechat	Muscicapidae	<i>Saxicola torquatus</i>	insectivorous	understory (ground foraging)

Farmland and forest fragments	Northern Grey-headed Sparrow	Passeridae	<i>Passer griseus</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Doubled spurred Francolin	Phasianidae	<i>Ptemistis bicalcaratus</i>	generalist	understory (ground foraging)
Farmland and forest fragments	Scaly Francolin	Phasianidae	<i>Ptemistis squamatus</i>	generalist	understory (ground foraging)
Farmland and forest fragments	Red-Collared Widowbird	Ploceidae	<i>Euplectes ardens</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Hartlaub's Marsh Widowbird	Ploceidae	<i>Euplectes hartlaubi</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Yellow-mantled Widowbird	Ploceidae	<i>Euplectes macroura</i>	granivores	understory (ground foraging)
Farmland and forest fragments	Red-tailed Bristlebill	Pycnonotidae	<i>Bleda syndactylus</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Black Crake	Rallidae	<i>Zapornia flavirostra</i>	omnivorous	understory (ground foraging)
Farmland and forest fragments	Common Whitethroat	Sylviidae	<i>Sylvia communis</i>	omnivorous	understory (ground foraging)
Farmland and forest fragments	Hadada Ibis	Threskiornithidae	<i>Bostrychia hagedash</i>	carnivores	understory (ground foraging)
Farmland and forest fragments	African Thrush	Turdidae	<i>Turdus pelios</i>	insectivorous	understory (ground foraging)
Farmland and forest fragments	Black Sparrowhawk	Accipitridae	<i>Accipiter melanoleucus</i>	carnivore	upper story (upper strata)
Farmland and forest fragments	Northern Puffback	Malaconotidae	<i>Dryoscopus gambensis</i>	insectivorous	upper story (upper strata)
Farmland and forest fragments	African Yellow White-eye	Zosteropidae	<i>Zosterops senegalensis</i>	insectivorous	upper story (upper strata)
Forest fragments	African Reed-warbler	Acrocephalidae	<i>Acrocephalus (scirpaceus) baeticatus</i>	insectivorous	aerial foliage gleaner (mid-story/understory)
Forest fragments	Yellow-footed Honeyguide	Indicatoridae	<i>Melignomon eisentrauti</i>	insectivorous	aerial foliage gleaner (mid-story/understory)
Forest fragments	African Hill-babbler	Sylviidae (Timaliidae)	<i>Sylvia (Pseudoalcippe) abyssinica</i>	insectivorous	aerial foliage gleaner (mid-story/understory)
Forest fragments	Black-collared Apalis	Cisticolidae	<i>Oreolais pulcher</i>	insectivorous	aerial foliage gleaner (midstory)
Forest fragments	Common Fiscal	Laniidae	<i>Lanius collaris</i>	insectivorous	aerial foliage gleaner (midstory)

Forest fragments	Olive Sunbird	Nectariniidae	<i>Cyanomitra olivacea</i>	nectarivores	aerial foliage gleaner (midstory)
Forest fragments	Little Greenbul	Pycnonotidae	<i>Eurillas virens</i>	generalist	aerial foliage gleaner (midstory)
Forest fragments	Dusky Crested-flycatcher	Stenostiridae	<i>Elminia nigromitrata</i>	insectivorous	aerial foliage gleaner (midstory)
Forest fragments	Black-capped Woodland Warbler	Sylviidae	<i>Phylloscopus herberti</i>	insectivorous	aerial foliage gleaner (midstory)
Forest fragments	Bamenda apalis	Cisticolidae	<i>Apalis bamendae</i>	insectivorous	aerial foliage gleaner (midstory)
Forest fragments	Lyre-tailed Honeyguide	Indicatoridae	<i>Melichneutes robustus</i>	insectivorous	aerial foliage gleaner (midstory)
Forest fragments	Cameroon Mountain Greenbul	Pycnonotidae	<i>Arizelocichla montana</i>	frugivores	aerial foliage gleaner (midstory)
Forest fragments	Western Mountain Greenbul	Pycnonotidae	<i>Arizelocichla tephrolaema</i>	frugivores	aerial foliage gleaner (midstory)
Forest fragments	Bangwa Warbler	Sylviidae (Locustellidae)	<i>Bradypterus (lopezi) bangwaensis</i>	insectivorous	aerial foliage gleaner (midstory)
Forest fragments	Red-shouldered Cuckooshrike	Campephagidae	<i>Campephaga phoenicea</i>	insectivorous	midstory foraging
Forest fragments	Naked-faced Barbet	Laniidae	<i>Gymnobucco calvus</i>	frugivores	midstory foraging
Forest fragments	Speckled Thinkerbird	Lybiidae	<i>Pogoniulus scolopaceus</i>	frugivores	midstory foraging
Forest fragments	Eastern Yellow-billed Barbet	Lybiidae	<i>Trachylaemus purpuratus</i>	frugivores	midstory foraging
Forest fragments	Black Bee-eater	Meropidae	<i>Merops gularis</i>	insectivorous	midstory foraging
Forest fragments	Blue-breasted Bee-eater	Meropidae	<i>Merops variegatus</i>	insectivorous	midstory foraging
Forest fragments	African Dusky Flycatcher	Muscicapidae	<i>Muscicapa adusta</i>	insectivorous	midstory foraging
Forest fragments	Grey Tit-flycatcher	Muscicapidae	<i>Myioparus plumbeus</i>	insectivorous	midstory foraging
Forest fragments	Pale-eyed Black Tit	Paridae	<i>Melaniparus guineensis</i>	insectivorous	midstory foraging
Forest fragments	Swamp Palm Bulbul	Pycnonotidae	<i>Thescelocichla leucopleura</i>	frugivores	midstory foraging

Forest fragments	Leaf-love	Pycnonotidae	<i>Pyrhurus scandens</i>	insectivorous	midstory foraging
Forest fragments	Green Hylia	Scotocercidae	<i>Hylia prasina</i>	insectivorous	midstory foraging
Forest fragments	Cameroon Olive-pigeon	Columbidae	<i>Columba sjostedti</i>	frugivores	midstory/understory
Forest fragments	Laughing Dove	Columbidae	<i>Spilopelia senegalensis</i>	frugivores	midstory/understory
Forest fragments	Mourning Collared-dove	Columbidae	<i>Streptopelia decipiens</i>	frugivores	midstory/understory
Forest fragments	Adamawa Turtle-dove	Columbidae	<i>Streptopelia hypopyrrha</i>	frugivores	midstory/understory
Forest fragments	Common Waxbill	Estrildidae	<i>Estrilda astrild</i>	granivores	midstory/understory
Forest fragments	Dybowski'sTwinspot	Estrildidae	<i>Euschistospiza dybowskii</i>	granivores	midstory/understory
Forest fragments	Thick-billed Seed eater	Fringillidae	<i>Crithagra burtoni</i>	granivores	midstory/understory
Forest fragments	White-crowned Robin-chat	Muscicapidae	<i>Cossypha albicapillus</i>	insectivorous	midstory/understory
Forest fragments	Blue-shouldered Robin-chat	Muscicapidae	<i>Cossypha cyanocampter</i>	insectivorous	midstory/understory
Forest fragments	Fine-spotted Woodpecker	Picidae	<i>Campethera punctuligera</i>	insectivorous	midstory/understory
Forest fragments	White-spotted Flufftail	Rallidae	<i>Sarothrura pulchra</i>	insectivorous	midstory/understory
Forest fragments	African Grey Hornbill	Bucerotidae	<i>Lophoceros nasutus</i>	frugivores	midstory/uppper story
Forest fragments	African Emerald Cuckoo	Cuculidae	<i>Chrysococcyx cupreus</i>	insectivorous	midstory/uppper story
Forest fragments	Velvet-mantled Drongo	Dicruridae	<i>Dicrurus modestus</i>	insectivorous	midstory/uppper story
Forest fragments	African Golden Oriole	Oriolidae	<i>Oriolus auratus</i>	frugivores	midstory/uppper story
Forest fragments	Buff-throated Apalis	Cisticolidae	<i>Apalis rufogularis</i>	insectivorous	midstory/uppper story
Forest fragments	Sun lark	Alaudidae	<i>Galerida modesta</i>	insectivorous	understory (ground foraging)
Forest fragments	Flappet Lark	Alaudidae	<i>Mirafra rufocinnamomea</i>	insectivorous	understory (ground foraging)

Forest fragments	Brown-chested Lapwing	Charadriidae	<i>Vanellus superciliosus</i>	insectivorous	understory (ground foraging)
Forest fragments	Levaillant's Cuckoo	Cuculidae	<i>Clamator levaillantii</i>	insectivorous	understory (ground foraging)
Forest fragments	Lesser Honeyguide	Indicatoridae	<i>Indicator minor</i>	insectivorous	understory (ground foraging)
Forest fragments	Long-billed Pipit	Motacillidae	<i>Anthus similis</i>	insectivorous	understory (ground foraging)
Forest fragments	Western Yellow Wagtail	Motacillidae	<i>Motacilla flava</i>	insectivorous	understory (ground foraging)
Forest fragments	Northern Wheatear	Muscicapidae	<i>Oenanthe oenanthe</i>	insectivorous	understory (ground foraging)
Forest fragments	Broad-tailed Grassbird	Sylviidae (Locustellidae)	<i>Schoenicola platyurus</i>	insectivorous	understory (ground foraging)
Forest fragments	Horus Swift	Apodidae	<i>Apus horus</i>	insectivorous	upper story (upper strata)
Forest fragments	African Palm-swift	Apodidae	<i>Cypsiurus parvus</i>	insectivorous	upper story (upper strata)
Forest fragments	Western Piping Hornbill	Bucerotidae	<i>Bycanister fistulator</i>	frugivores	upper story (upper strata)
Forest fragments	Diederik Cuckoo	Cuculidae	<i>Chrysococcyx caprius</i>	insectivorous	upper story (upper strata)
