

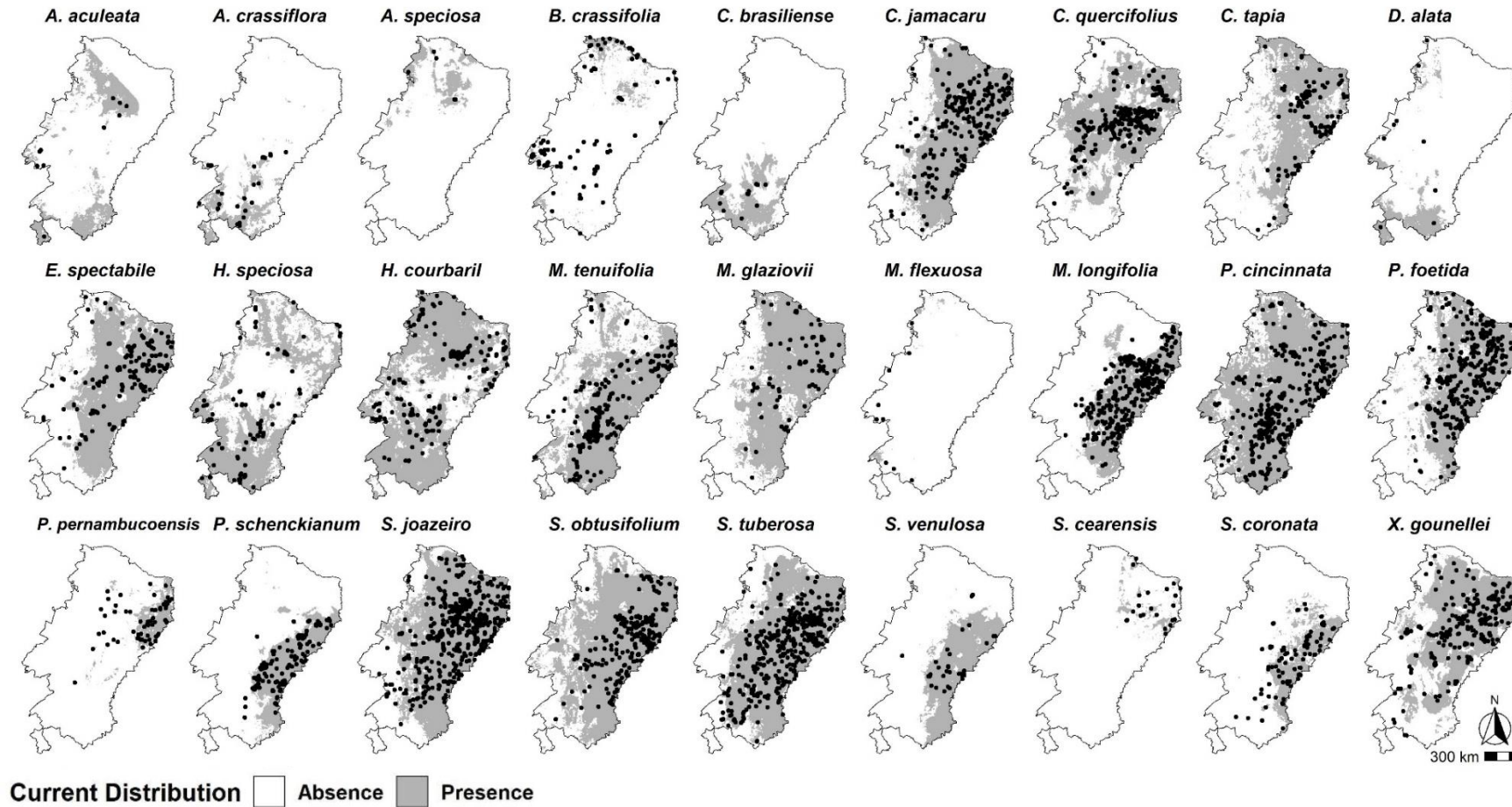
AMBIO

Food diversification as an adaptation strategy to climate change: habitat suitability for wild and cultivated food plants in the Brazilian Semiarid

Electronic Supplementary Material: Figures and Tables

Figure S1. Maps of binarized habitat suitability models (presence, absence), in the current climate scenario (1970-2000) with species occurrence records in the Brazilian Semi-arid. Occurrence records (black dots) of the 27 wild food plants and 26 cultivated food plants were obtained from the Global Biodiversity Information Facility - GBIF (GBIF, 2022).

Wild Food Plants



Cultivated Food Plants

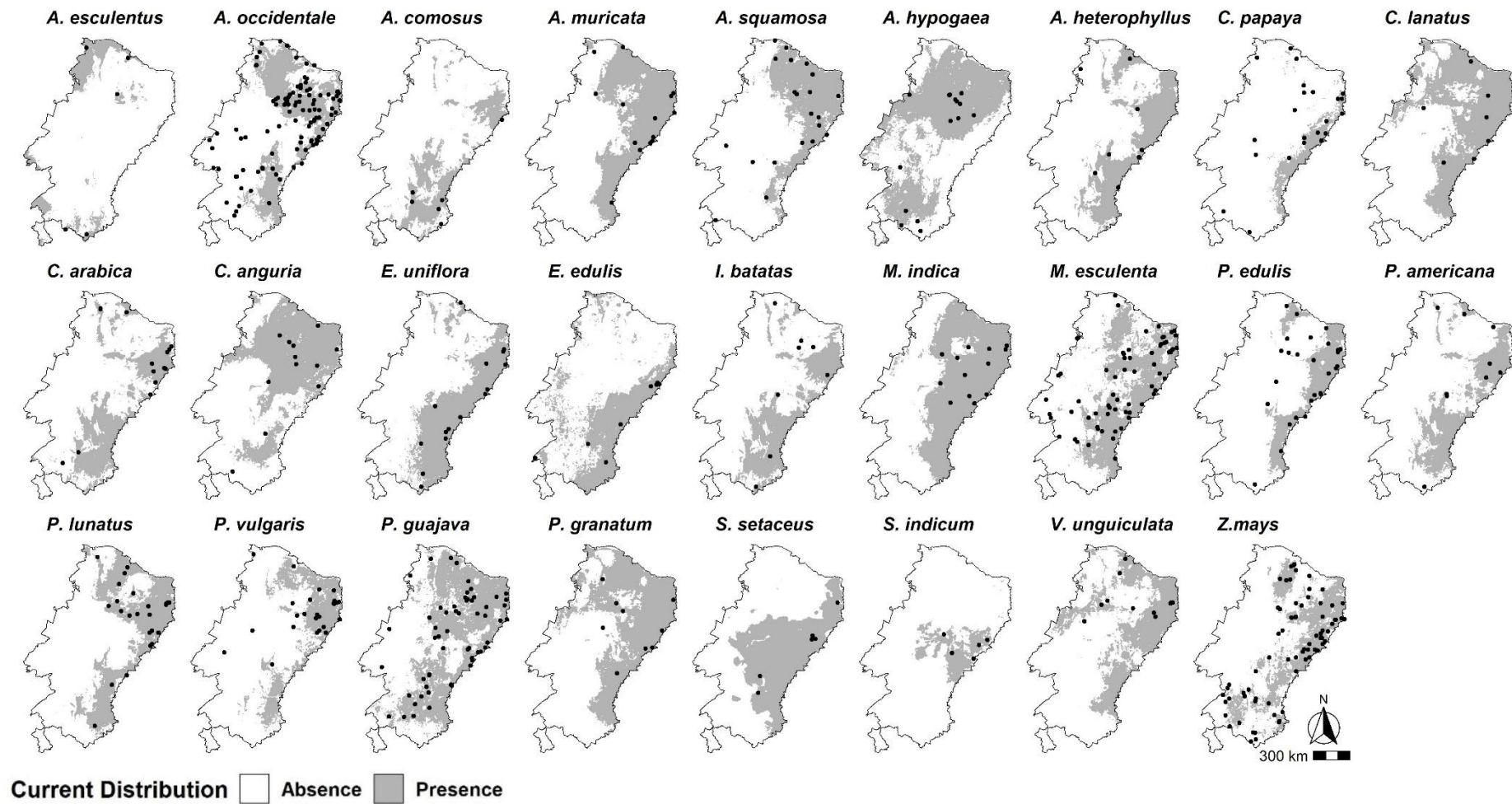
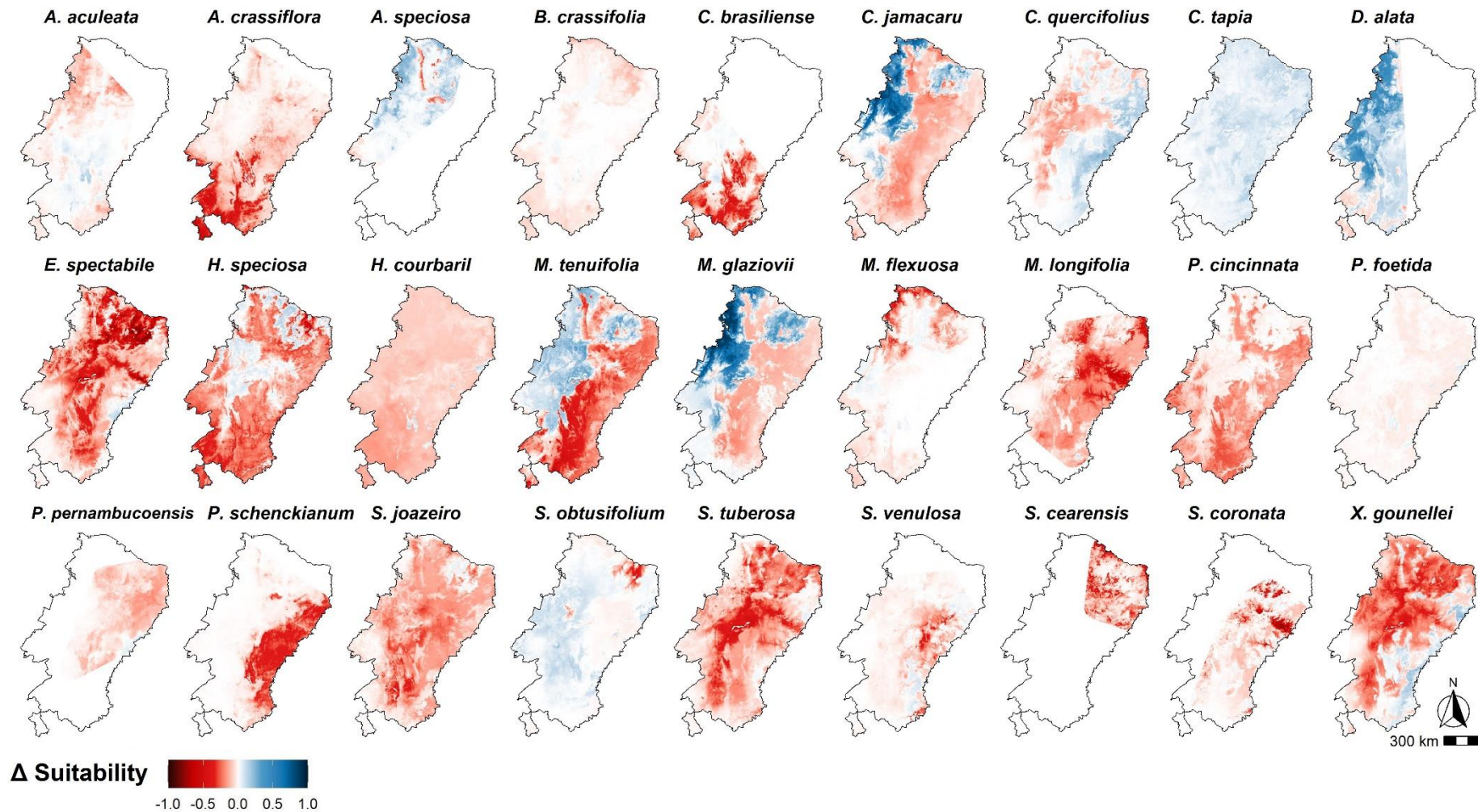
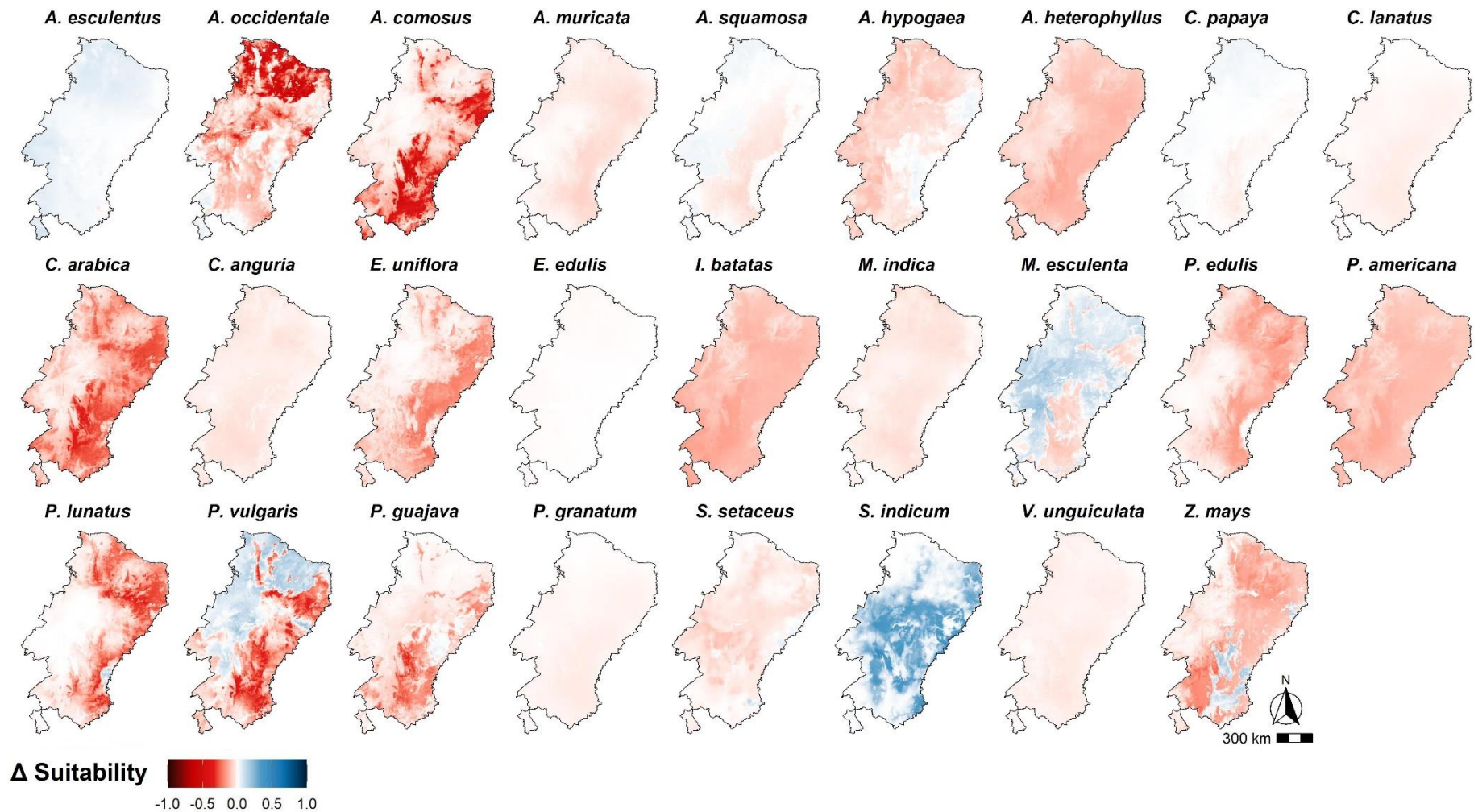


Figure S2. Variation in habitat suitability for cultivated and wild species in the Brazilian Semi-arid in the four climate change scenarios (SSPs) (2041-2060). The variation was calculated by the difference between climate scenarios (future - current). Positive values indicate an increase and negative values indicate a reduction in habitat suitability for the species.

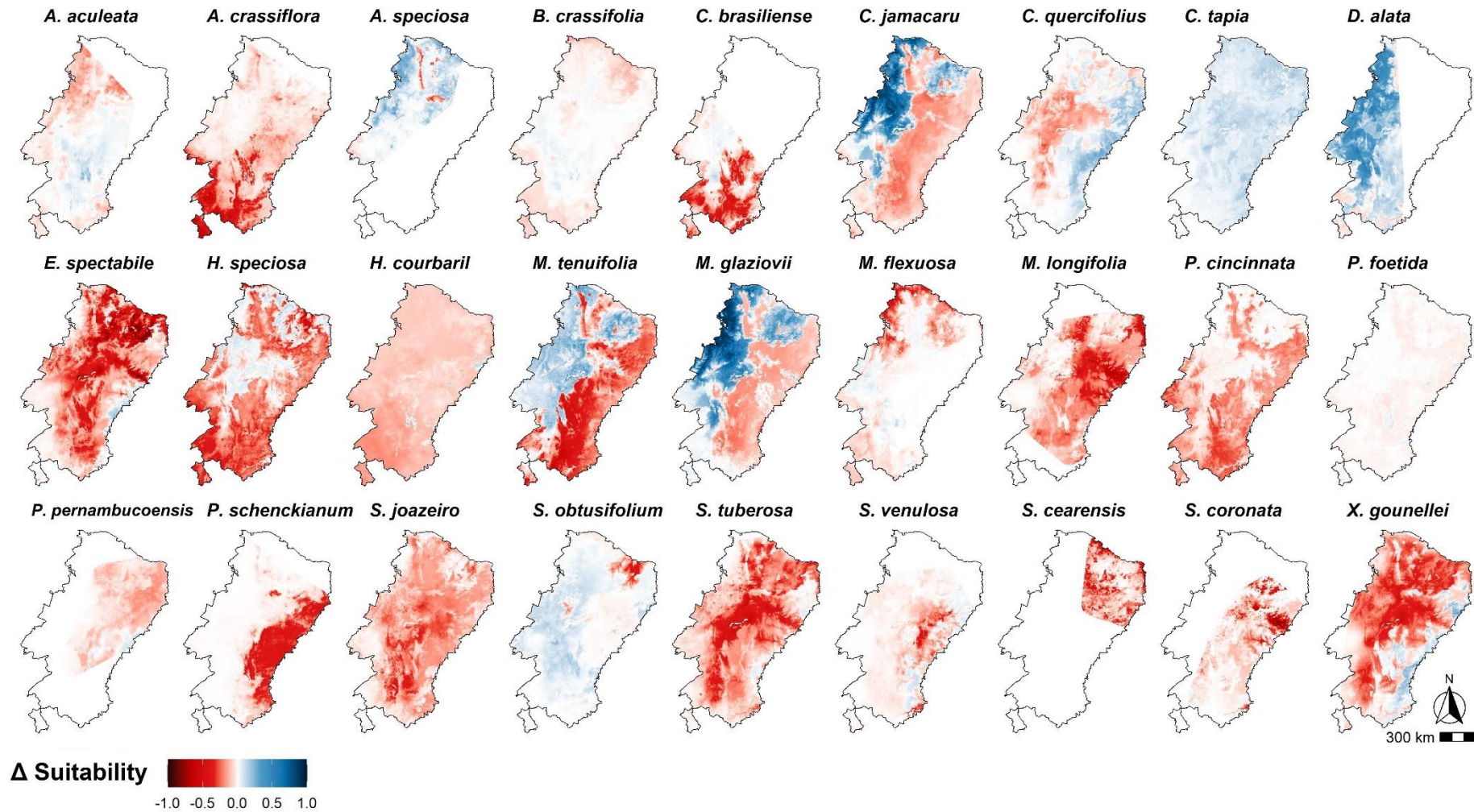
SSP1-2.6 – Wild Food Plants



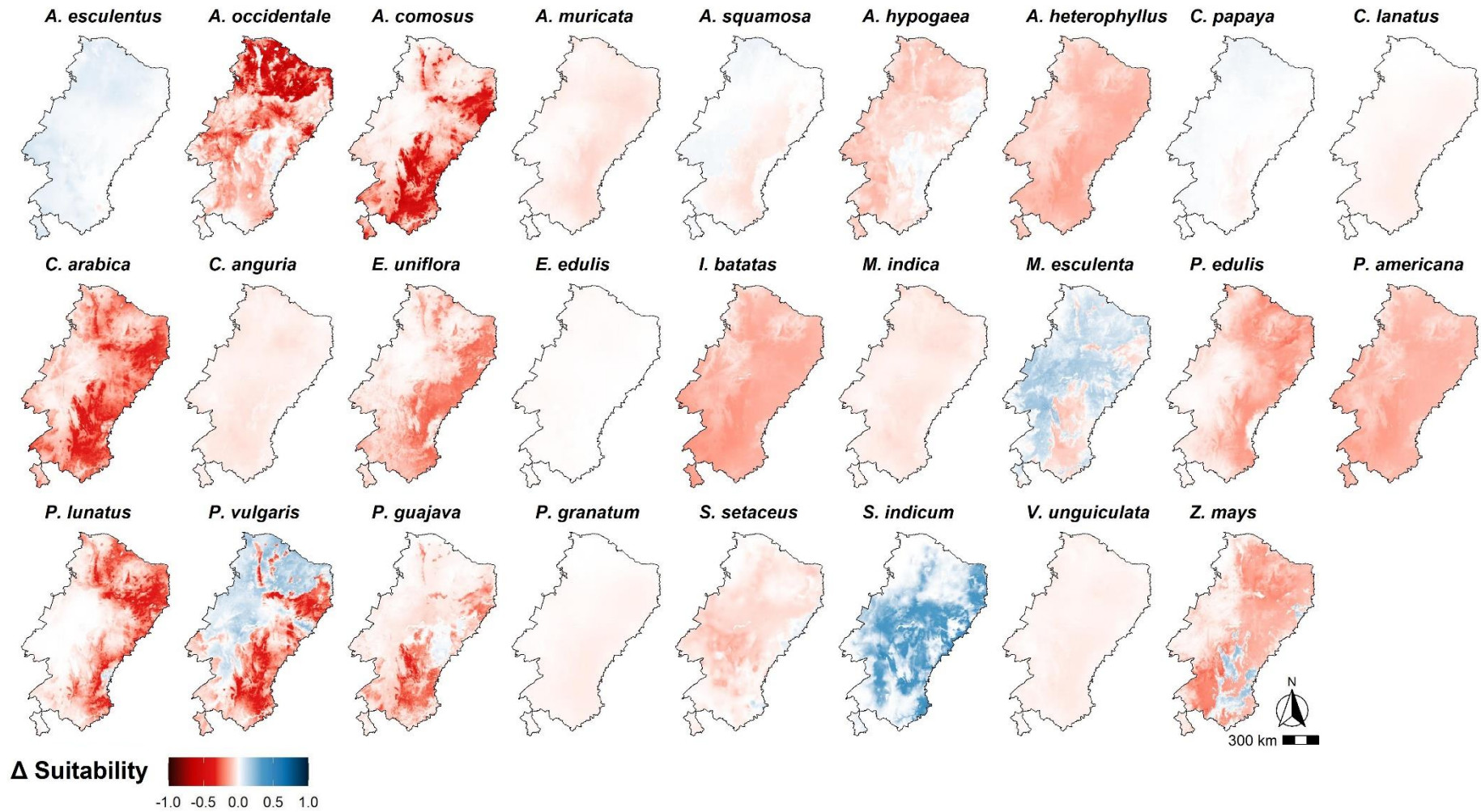
SSP1-2.6 – Cultivated Food Plants



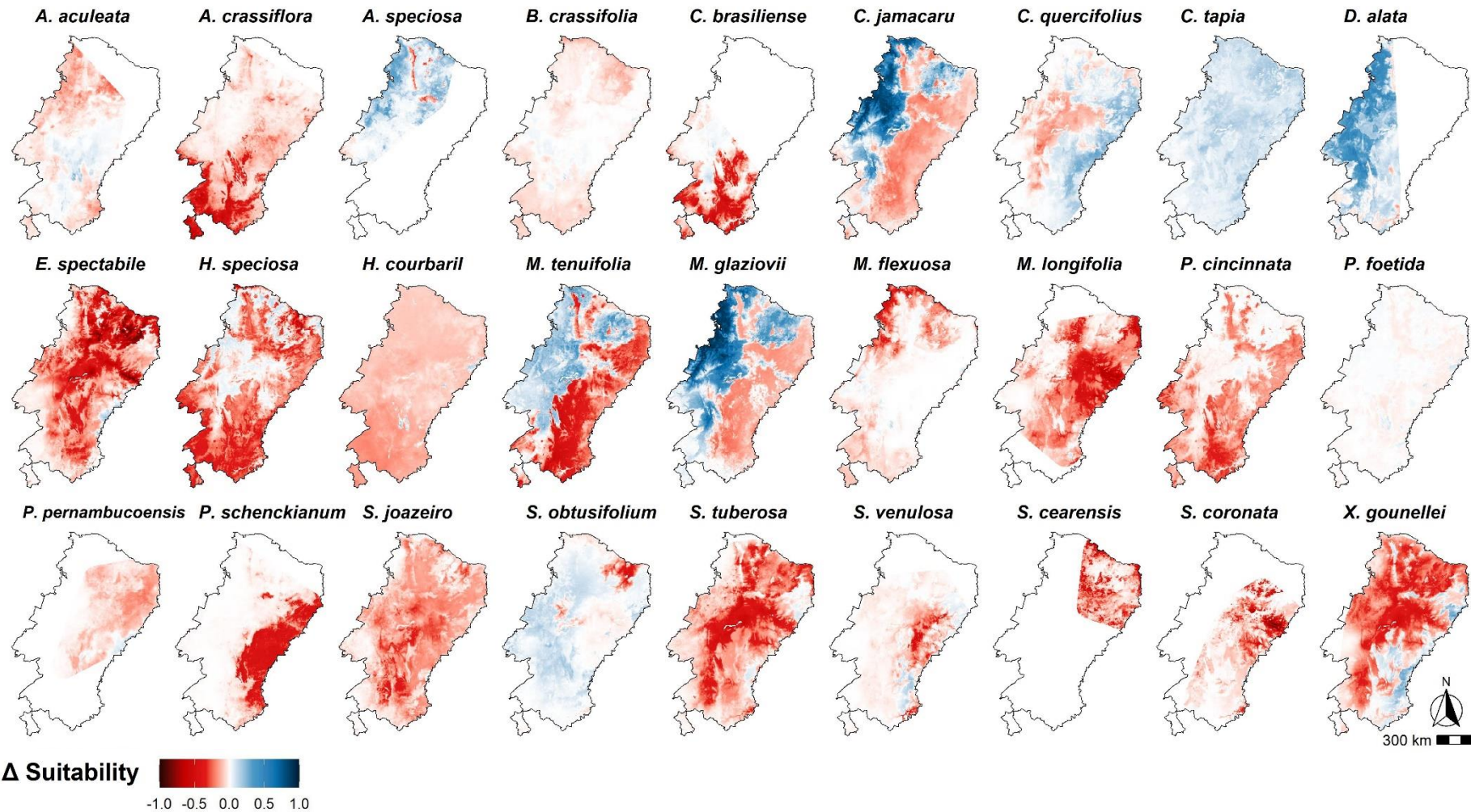
SSP2-4.5 – Wild Food Plants



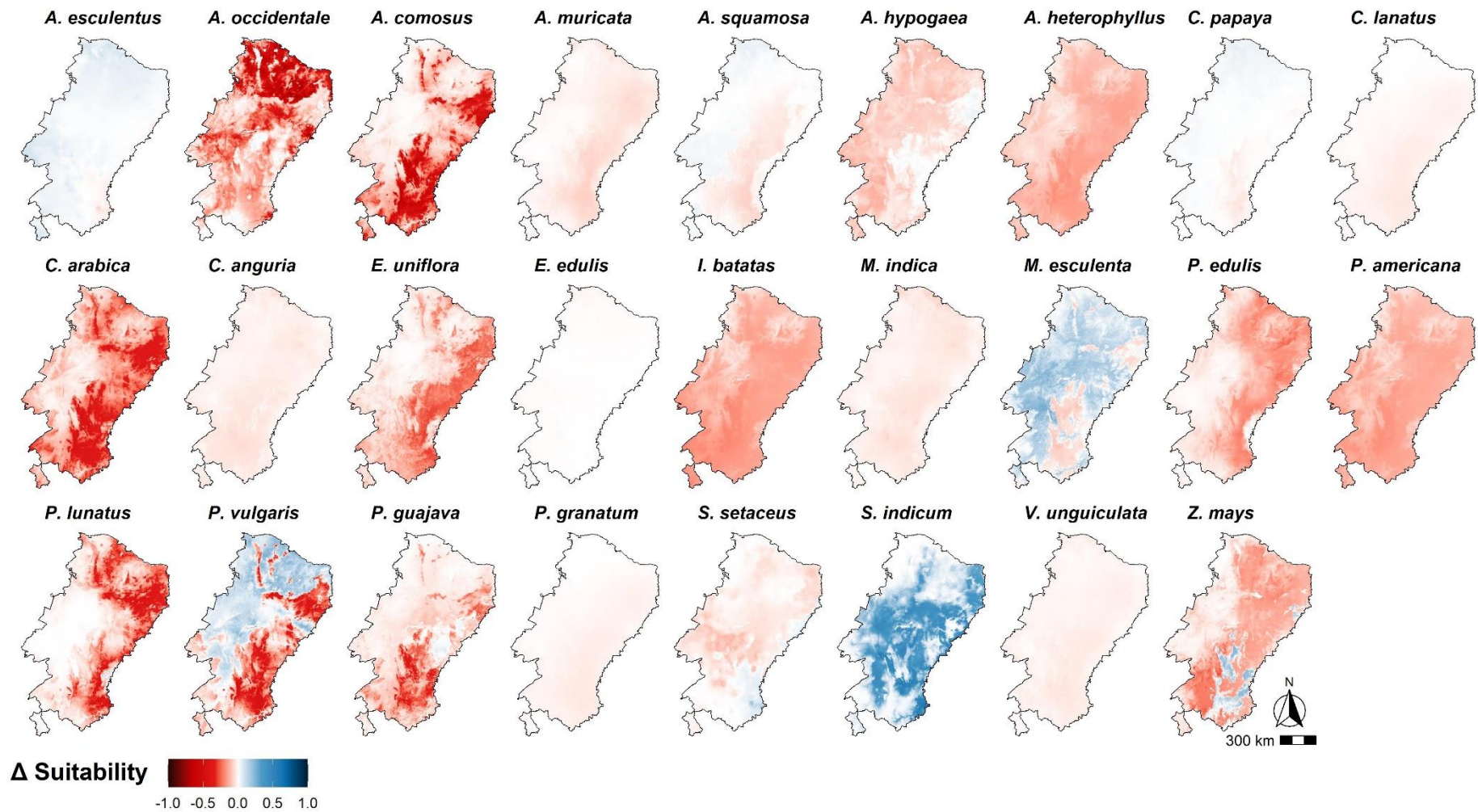
SSP2-4.5 – Cultivated Food Plants



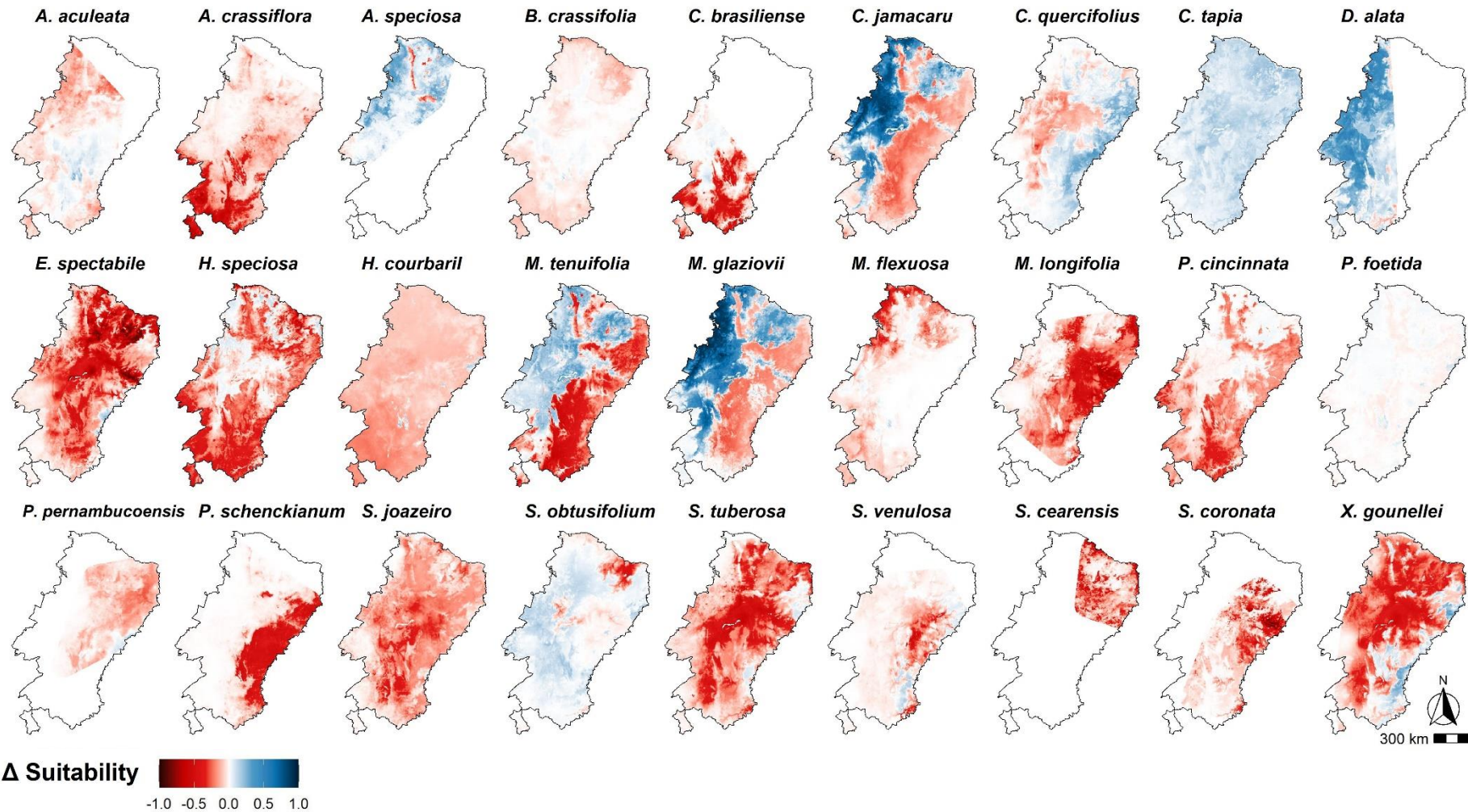
SSP3-7.0 – Wild Food Plants



SSP3-7.0 – Cultivated Food Plants



SSP5-8.5 – Wild Food Plants



SSP5-8.5 – Cultivated Food Plants

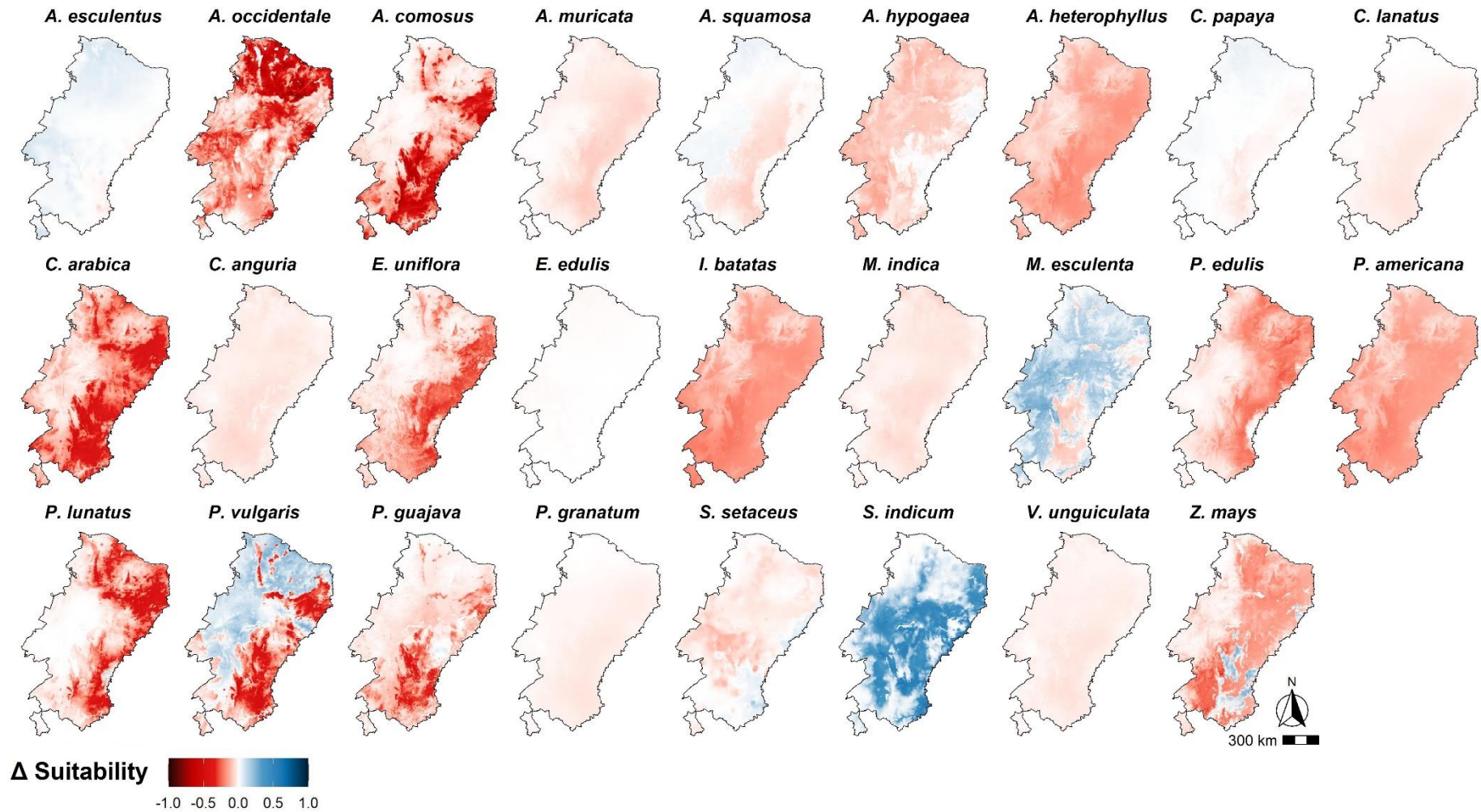


Figure S3. Number of species (cultivated and wild food plants) in the current scenario (1970–2000) and in the four future climate change scenarios (SSPs) (2041–2060) in Brazilian Semi-arid.

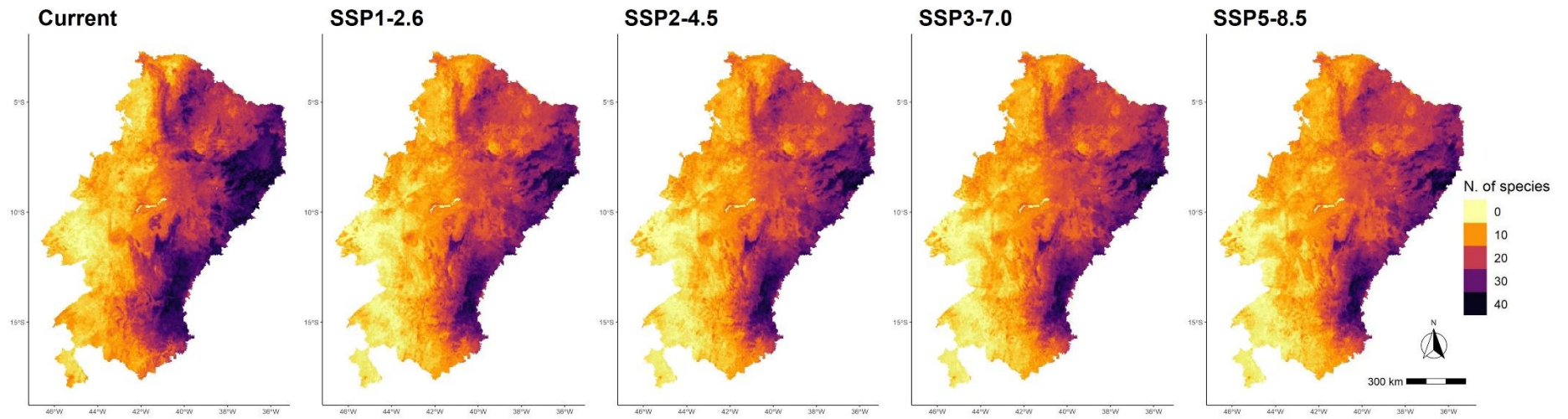


Table S1. Relative contribution (RC) of the yield of cultivated food plants in the Brazilian Semiarid. Data on crop yield (in tons) are from the Brazilian Agricultural Census (IBGE, 2017b, 2017c, 2017d). * Species selected for habitat suitability modeling.

Species	Yield (t)	RC (%)
<i>Zea mays</i> *	604384	21.12348
<i>Manihot esculenta</i> *	505228	17.65794
<i>Saccharum officinarum</i>	308384	10.77815
<i>Cocos nucifera</i>	160933	5.62468
<i>Vigna unguiculata</i> *	145107	5.07155
<i>Citrullus lanatus</i> *	143796	5.02573
<i>Solanum lycopersicum</i>	110991	3.87918
<i>Mangifera indica</i> *	104566	3.65463
<i>Passiflora edulis</i> *	90467	3.16186
<i>Ananas comosus</i> *	84347	2.94796
<i>Cucurbita moschata</i>	59261	2.07120
<i>Phaseolus vulgaris</i> *	58030	2.02817
<i>Anacardium occidentale</i> *	53090	1.85552
<i>Ipomoea batatas</i> *	37018	1.29380
<i>Capsicum annuum</i>	36752	1.28450
<i>Oryza sativa</i>	36627	1.28013
<i>Sicyos edulis</i>	36558	1.27772
<i>Carica papaya</i> *	31398	1.09737
<i>Psidium guajava</i> *	30898	1.07990
<i>Daucus carota</i>	29637	1.03583
<i>Cucumis melo</i>	28334	0.99029
<i>Abelmoschus esculentus</i> *	21505	0.75161
<i>Vitis vinifera</i>	20626	0.72089
<i>Malpighia emarginata</i>	18067	0.63145
<i>Cucumis sativus</i>	13927	0.48675
<i>Phaseolus lunatus</i> *	13393	0.46809
<i>Coffea arabica</i> *	10636	0.37173
<i>Beta vulgaris</i>	10517	0.36757
<i>Artocarpus heterophyllus</i> *	8295	0.28991
<i>Citrus reticulata</i>	8163	0.28530
<i>Annona squamosa</i> *	4764	0.16650
<i>Cucumis anguria</i> *	4753	0.16612
<i>Solanum aethiopicum</i>	4568	0.15965
<i>Solanum melongena</i>	3713	0.12977

<i>Brassica oleracea</i>	3504	0.12247
<i>Theobroma cacao</i>	2991	0.10454
<i>Cucurbita pepo</i>	2868	0.10024
<i>Annona muricata</i> *	2150	0.07514
<i>Fragaria vesca</i>	2120	0.07409
<i>Colocasia esculenta</i>	1740	0.06081
<i>Arachis hypogaea</i> *	1458	0.05096
<i>Dioscorea alata</i>	1301	0.04547
<i>Persea americana</i> *	1130	0.03949
<i>Glycine max</i>	1113	0.03890
<i>Solanum tuberosum</i>	782	0.02733
<i>Arracacia xanthorrhiza</i>	489	0.01709
<i>Plinia peruviana</i>	201	0.00703
<i>Sesamum indicum</i> *	137	0.00479
<i>Selenicereus setaceus</i> *	89	0.00311
<i>Punica granatum</i> *	87	0.00304
<i>Coffea canephora</i>	84	0.00294
<i>Raphanus sativus</i>	67	0.00234
<i>Euterpe oleracea</i>	47	0.00164
<i>Euterpe edulis</i> *	31	0.00108
<i>Brassica rapa</i>	31	0.00108
<i>Elaeis guineensis</i>	9	0.00031
<i>Helianthus annuus</i>	9	0.00031
<i>Paullinia cupana</i>	9	0.00031
<i>Lathyrus oleraceus</i>	7	0.00024
<i>Theobroma grandiflorum</i>	5	0.00017
<i>Secale cereale</i>	2	0.00007
<i>Eugenia uniflora</i> *	1	0.00003
TOTAL	2861195	100.00000

Table S2. Wild and cultivated plants of economic and food importance for the semiarid region of Brazil selected as target species in this study. Taxonomic authorities are in accordance with Plants of the World Online (2022) and Flora e Funga do Brasil (2022). The cultivated plants were initially identified from the database on registered Brazilian cultivars (CultivarWeb, 2022). Abbreviations: IBGE = IBGE database for plants from agriculture and extractive activities in the Brazilian semiarid region (IBGE, 2017a, b, c, d); Jacob = Database for strategic food plants in the Caatinga (Jacob et al., 2020). The numbers represent the references for the taxonomic identification of the species: 1 = Guimarães et al. (2020); 2 = Machado et al. (2015); 3 = Souza et al. (2020); 4 = Mitchell and Daly (2015); 5 = Bailão et al. (2021); 6 = Carvalho (2008); 7 = Porro (2019); 8 = Guimarães et al. (2021); 9 = Takemoto et al. (2001); 10 = San-Martín-Hernández et al. (2023); 11 = Freire Filho (2011); 12 = Faleiro et al. (2005); 13 = Knabben and Costa (2012); 14 = Lovato et al. (2017); 15 = Guedes and Guerra (2007); 16 = Barbosa and Arriel (2019); 17 = Gama (2020); 18 = Mosca et al. (2006).

Family	Scientific name	Common name	Group	Database
Anacardiaceae R.Br.	<i>Anacardium occidentale</i> L.	Caju	Cultivated	IBGE
	<i>Mangifera indica</i> L.	Manga	Cultivated	IBGE
	<i>Spondias tuberosa</i> Arruda	Umbu	Wild	Jacob, IBGE
	<i>Spondias venulosa</i> (Mart. ex Engl.) Engl.	Cajarana	Wild	IBGE (1, 2, 3, 4)
Annonaceae Juss.	<i>Annona crassiflora</i> Mart.	Araticum	Wild	IBGE (5)
	<i>Annona muricata</i> L.	Graviola	Cultivated	IBGE
	<i>Annona squamosa</i> L.	Fruta-do-conde	Cultivated	IBGE (18)
Apocynaceae Juss.	<i>Hancornia speciosa</i> Gomes	Mangaba	Wild	IBGE (5)
	<i>Mandevilla tenuifolia</i> (J.C.Mikan) Woodson	Manofê	Wild	Jacob
Arecaceae Schultz Sch.	<i>Acrocomia aculeata</i> (Jacq.) Lodd. ex R.Keith	Macaúba	Wild	IBGE (6)
	<i>Attalea speciosa</i> Mart.	Babaçu	Wild	IBGE (7)
	<i>Euterpe edulis</i> Mart.	Palmito	Cultivated	IBGE
	<i>Mauritia flexuosa</i> L.f.	Buriti	Wild	IBGE (5)
	<i>Syagrus cearensis</i> Noblick	Coco-católé	Wild	Jacob
	<i>Syagrus coronata</i> (Mart.) Becc.	Licuri	Wild	IBGE (8)
Bromeliaceae A.Juss.	<i>Ananas comosus</i> (L.) Merrill	Abacaxi	Cultivated	IBGE
	<i>Encholirium spectabile</i> Mart. ex Schult. & Schult.f.	Macambira-de-flexa	Wild	Jacob
Cactaceae Juss.	<i>Cereus jamacaru</i> DC.	Mandacaru	Wild	Jacob
	<i>Pilosocereus pachycladus</i> subsp. <i>pernambucoensis</i> (F.Ritter) Zappi	Facheiro	Wild	Jacob
	<i>Selenicereus setaceus</i> (Salm-Dyck) Berg	Pitaia	Cultivated	IBGE
	<i>Xiquexique gounellei</i> (F.A.C.Weber ex K.Schum.) Lavor & Calvente	Xique-xique	Wild	Jacob
Capparaceae A.Juss.	<i>Crateva tapia</i> L.	Trapiá	Wild	Jacob
	<i>Morisonia longifolia</i> (Mart.) Christenh. & Byng	Incó	Wild	Jacob
Caricaceae Dumort.	<i>Carica papaya</i> L.	Mamão	Cultivated	IBGE
Caryocaraceae Voigt	<i>Caryocar brasiliense</i> A.St.-Hil.	Pequi	Wild	IBGE (5)
Convolvulaceae Juss.	<i>Ipomoea batatas</i> (L.) Lam.	Batata-doce	Cultivated	IBGE
Cucurbitaceae A.Juss.	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Melancia	Cultivated	IBGE
	<i>Cucumis anguria</i> L.	Maxixe	Cultivated	IBGE
Euphorbiaceae Juss	<i>Cnidoscolus quercifolius</i> Pohl	Favela-branca	Wild	Jacob
	<i>Manihot carthagenensis</i> subsp. <i>glaziovii</i> (Müll.Arg.) Allem	Purnunça	Wild	Jacob
	<i>Manihot esculenta</i> Crantz	Mandioca ou aipim	Cultivated	IBGE
Fabaceae Lindl.	<i>Arachis hypogaea</i> L.	Amendoim	Cultivated	IBGE
	<i>Dipteryx alata</i> Vogel	Baru	Wild	IBGE (5, 9)
	<i>Hymenaea courbaril</i> L.	Jatobá	Wild	Jacob
	<i>Phaseolus lunatus</i> L.	Fava	Cultivated	IBGE (16, 17)
	<i>Phaseolus vulgaris</i> L.	Feijão	Cultivated	IBGE (13, 14, 15)
	<i>Vigna unguiculata</i> (L.) Walp.	Feijão-fradinho	Cultivated	IBGE (11)
Lauraceae Juss.	<i>Persea americana</i> Mill.	Abacate	Cultivated	IBGE
Lythraceae J.St.-Hil.	<i>Punica granatum</i> L.	Romã	Cultivated	IBGE
Malpighiaceae Juss.	<i>Byrsonima crassifolia</i> (L.) Kunth	Murici	Wild	IBGE (5, 10)
Malvaceae Juss.	<i>Abelmoschus esculentus</i> (L.) Moench	Quiabo	Cultivated	IBGE
Moraceae Gaudich.	<i>Artocarpus heterophyllus</i> Lam.	Jaca	Cultivated	IBGE
Myrtaceae Juss.	<i>Eugenia uniflora</i> L.	Pitanga	Cultivated	IBGE
	<i>Psidium guajava</i> L.	Goiaba	Cultivated	IBGE
	<i>Psidium schenckianum</i> Kiaersk.	Pirim	Wild	Jacob
Passifloraceae Juss. ex Roussel	<i>Passiflora cincinnata</i> Mast.	Maracujá-do-mato	Wild	Jacob
	<i>Passiflora edulis</i> Sims	Maracujá	Cultivated	IBGE (12)
	<i>Passiflora foetida</i> L.	Maracujá-de-estralo	Wild	Jacob
Pedaliaceae R.Br.	<i>Sesamum indicum</i> L.	Gergelim	Cultivated	IBGE
Poaceae Barnhart	<i>Zea mays</i> L.	Milho	Cultivated	IBGE
Rhamnaceae Juss.	<i>Sarcomphalus joazeiro</i> (Mart.) Hauenschild	Juá	Wild	Jacob
Rubiaceae Juss.	<i>Coffea arabica</i> L.	Café-arábica	Cultivated	IBGE
Sapotaceae Juss.	<i>Sideroxylon obtusifolium</i> (Roem. & Schult.) T.D.Penn.	Quixaba	Wild	Jacob

Table S3. Parameters used in habitat suitability models for wild and cultivated food plants. Records = number of occurrence records with coordinates, RM = regularization multiplier (L = linear, Q = quadratic, H = hinge, P = product, T = threshold), FC = resource classes, AICc = corrected Akaike information criterion, AUC = area under the curve receiver operating characteristic values, Threshold = threshold value for binarization (maximum training sensitivity plus specificity). Asterisks represent endemism: * = Species endemic to Brazil, ** = Species endemic to Brazil and restricted to the Caatinga.

Species	Group	Records	RM	FC	AICc	AUC	Threshold	Environmental Variables ¹
<i>Abelmoschus esculentus</i>	Cultivated	5	1.5	L	113.88	0.86	0.57	bio_13, bdod_15_30, phh2o_30_60, nitro_0_5, bio_10, bio_02, sand_30_60
<i>Acrocomia aculeata</i>	Wild	441	1	LQHP	11243.46	0.84	0.36	cec_30_60, bio_13, bio_10, ocd_15_30, bio_17, bio_07, sand_30_60, bdod_0_5, nitro_15_30
<i>Anacardium occidentale</i>	Cultivated	110	1	LQHP	2425.37	0.80	0.58	bio_02, sand_30_60, phh2o_30_60, bio_10, bio_13, nitro_0_5, bdod_15_30
<i>Ananas comosus</i>	Cultivated	6	2	L	127.78	0.92	0.36	bio_10, bio_02, bdod_15_30, sand_30_60, nitro_0_5, bio_13
<i>Annona crassiflora</i>	Wild	234	0.5	LQHP	5387.74	0.84	0.43	bio_10, cec_0_5, bio_13, bio_07, ocd_5_15, silt_30_60, bio_14, nitro_15_30
<i>Annona muricata</i>	Cultivated	14	0.5	LQ	319.32	0.82	0.43	bio_02, bio_13, sand_30_60, bdod_15_30, nitro_0_5, bio_10, phh2o_30_60
<i>Annona squamosa</i>	Cultivated	21	1	LQH	490.04	0.80	0.67	bio_02, phh2o_30_60, bdod_15_30, bio_13, sand_30_60
<i>Arachis hypogaea</i>	Cultivated	17	1	LQH	397.10	0.73	0.56	nitro_0_5, bio_02, bio_13, bio_10
<i>Artocarpus heterophyllus</i>	Cultivated	8	0.5	L	180.13	0.80	0.58	bio_02, bio_10, phh2o_30_60, bio_13
<i>Attalea speciosa</i>	Wild	54	1	LQHP	1336.43	0.87	0.52	phh2o_30_60, bio_14, bio_13, bio_06, bio_08, soc_15_30, sand_30_60, nitro_30_60
<i>Byrsonima crassifolia</i>	Wild	2821	0.5	LQHPT	71439.59	0.76	0.46	nitro_30_60, cec_30_60, bio_14, bio_13, bio_08, sand_30_60, bio_07, bdod_0_5, soc_5_15
<i>Carica papaya</i>	Cultivated	23	1.5	LQH	515.18	0.77	0.84	bio_02, phh2o_30_60, nitro_0_5, bdod_15_30, sand_30_60, bio_10, bio_13
<i>Caryocar brasiliense</i>	Wild	121	1	LQH	2756.01	0.84	0.32	bio_08, phh2o_30_60, ocd_5_15, bio_07, silt_30_60, bio_15, soc_15_30
<i>Cereus jamacaru</i> *	Wild	320	1.5	LQHPT	7095.86	0.88	0.31	cec_0_5, bio_07, bio_13, bio_14, sand_30_60, bio_10, silt_30_60, soc_15_30
<i>Citrullus lanatus</i>	Cultivated	7	1	L	158.09	0.80	0.58	bio_02, sand_30_60, phh2o_30_60, bio_10
<i>Cnidoscolus quercifolius</i> *	Wild	265	1	LQHP	5506.04	0.92	0.25	bio_13, nitro_15_30, bio_07, bio_14, bio_10, bdod_0_5, sand_30_60
<i>Coffea arabica</i>	Cultivated	14	1	LQ	302.35	0.83	0.45	bio_10, bio_02, bio_13, sand_30_60, nitro_0_5
<i>Crateva tapia</i>	Wild	1123	0.5	LQHPT	27918.31	0.83	0.35	cec_30_60, bio_08, nitro_30_60, bio_07, bio_14, sand_30_60, bio_13, bdod_0_5
<i>Cucumis anguria</i>	Cultivated	12	2.5	LQ	269.56	0.77	0.55	bio_02, nitro_0_5, bio_13, sand_30_60, phh2o_30_60, bio_10
<i>Dipteryx alata</i>	Wild	359	1	LQHPT	8756.59	0.82	0.56	phh2o_15_30, bio_13, bio_14, silt_0_5, ocd_5_15, nitro_15_30, bio_05, cfvo_15_30, clay_30_60
<i>Encholirium spectabile</i> *	Wild	170	2.5	LQHPT	3673.16	0.86	0.35	cec_0_5, bio_07, bio_13, bio_10, bio_14, sand_30_60
<i>Eugenia uniflora</i>	Cultivated	15	1	LQH	377.39	0.89	0.31	bio_02, nitro_0_5, bio_10, bio_13, phh2o_30_60, bdod_15_30
<i>Euterpe edulis</i>	Cultivated	8	1	L	181.28	0.81	0.55	nitro_0_5, bio_13, bio_10
<i>Hancornia speciosa</i>	Wild	597	0.5	LQHP	14554.26	0.81	0.45	bio_08, bio_13, bio_14, soc_5_15, silt_30_60, ocd_15_30, bio_07, nitro_30_60, cec_5_15
<i>Hymenaea courbaril</i>	Wild	1338	0.5	LQHP	34918.05	0.74	0.53	phh2o_30_60, bio_07, bio_08, bio_14, nitro_30_60, bio_13, sand_30_60, cec_30_60, ocd_15_30
<i>Ipomoea batatas</i>	Cultivated	8	1	L	180.54	0.75	0.65	bio_10, bio_02, nitro_0_5, bio_13
<i>Mandevilla tenuifolia</i>	Wild	586	0.5	LQHP	13480.17	0.86	0.25	bio_05, bio_14, bio_13, bio_07, soc_15_30, nitro_30_60, bdod_15_30, silt_30_60
<i>Mangifera indica</i>	Cultivated	13	0.5	LQ	305.60	0.78	0.47	bio_02, phh2o_30_60, bio_13, sand_30_60, nitro_0_5, bio_10
<i>Manihot carthagenensis</i> *	Wild	94	1.5	LQ	2096.39	0.86	0.36	cec_0_5, ocd_5_15, bio_07, bio_10, silt_30_60, bio_14

<i>Manihot esculenta</i>	Cultivated	69	1	LQH	1548.88	0.76	0.56	bio_02, phh2o_30_60, bio_13, bdod_15_30, sand_30_60, bio_10, nitro_0_5
<i>Mauritia flexuosa</i>	Wild	511	0.5	LQHP	12930.56	0.77	0.50	soc_5_15, bio_13, phh2o_30_60, bio_08, bio_14, bio_07, sand_30_60
<i>Morisonia longifolia</i> *	Wild	366	1	H	7495.74	0.81	0.38	bio_13, bio_02, bio_10, nitro_15_30, silt_30_60
<i>Passiflora cincinnata</i>	Wild	714	0.5	LQHP	17420.78	0.85	0.32	silt_30_60, cec_5_15, bio_08, bio_14, bio_07, ocd_5_15, bdod_15_30
<i>Passiflora edulis</i>	Cultivated	27	1.5	LQH	577.20	0.83	0.65	bio_02, bio_10, bio_13, sand_30_60, nitro_0_5
<i>Passiflora foetida</i>	Wild	2724	0.5	LQHP	70407.64	0.77	0.50	cec_5_15, bio_08, bio_07, bio_14, silt_5_15, bdod_15_30, bio_13, ocd_15_30
<i>Persea americana</i>	Cultivated	9	0.5	L	212.08	0.79	0.68	bio_02, bio_10, sand_30_60, nitro_0_5, bio_13
<i>Phaseolus lunatus</i>	Cultivated	25	1	LQH	533.26	0.90	0.27	bio_02, bio_10, bio_13, sand_30_60, bdod_15_30, nitro_0_5
<i>Phaseolus vulgaris</i>	Cultivated	26	1	LQH	609.56	0.87	0.65	bio_02, bio_10, bdod_15_30, phh2o_30_60, bio_13
<i>Pilosocereus pachycladus</i> **	Wild	67	1	LQ	1318.59	0.80	0.65	bio_14, bio_02, cec_30_60, bio_10, silt_0_5, phh2o_30_60, nitro_15_30
<i>Psidium guajava</i>	Cultivated	57	1	LQH	1259.89	0.82	0.47	phh2o_30_60, bio_02, sand_30_60, bdod_15_30, nitro_0_5, bio_13, bio_10
<i>Psidium schenckianum</i>	Wild	161	1	LQHP	3130.06	0.95	0.15	cec_0_5, bio_10, sand_30_60, bio_14, bdod_5_15, cfvo_30_60, nitro_15_30
<i>Punica granatum</i>	Cultivated	9	0.5	L	213.09	0.75	0.58	bio_02, sand_30_60, bio_13, bio_10
<i>Sarcomphalus joazeiro</i>	Wild	637	0.5	LQHP	14505.81	0.91	0.33	bio_13, cec_15_30, sand_30_60, bio_07, nitro_5_15, bio_14, bio_08, bdod_15_30
<i>Selenicereus setaceus</i>	Cultivated	6	1.5	L	131.78	0.87	0.40	bio_13, bio_02, nitro_0_5, phh2o_30_60, bdod_15_30
<i>Sesamum indicum</i>	Cultivated	6	1	L	160.33	0.96	0.57	bio_13, bio_10, sand_30_60, bio_02, bdod_15_30
<i>Sideroxylon obtusifolium</i>	Wild	605	0.5	LQ	14811.44	0.90	0.22	bio_04, cec_5_15, bio_08, bio_13, bdod_15_30, sand_30_60, silt_30_60, bio_14, ocd_30_60
<i>Spondias tuberosa</i> *	Wild	438	1	LQHP	9507.10	0.89	0.21	phh2o_30_60, bio_13, cec_0_5, bio_07, bio_10, soc_15_30, sand_30_60
<i>Spondias venulosa</i> *	Wild	96	1	H	2012.76	0.94	0.15	bio_14, bio_13, bio_07, bio_04, bdod_15_30, bio_08, silt_30_60
<i>Syagrus cearensis</i> **	Wild	26	1	L	485.83	0.83	0.67	nitro_15_30, bio_10, cec_0_5, bio_14, bio_07, sand_30_60
<i>Syagrus coronata</i> **	Wild	143	2.5	LQHPT	2829.18	0.81	0.42	bio_02, nitro_30_60, bio_13, ocd_30_60, clay_5_15, bio_10, sand_30_60, bdod_30_60
<i>Vigna unguiculata</i>	Cultivated	12	1	LQ	268.58	0.77	0.65	bio_02, sand_30_60, bio_13, phh2o_30_60, bio_10
<i>Xiquexique gounellei</i> *	Wild	232	1	LQHPT	4959.49	0.79	0.40	bio_07, bio_13, bio_14, bio_10, sand_30_60, ocd_30_60
<i>Zea mays</i>	Cultivated	74	1	LQH	1619.44	0.82	0.62	phh2o_30_60, bio_02, bio_13, nitro_0_5, bio_10, sand_30_60, bdod_15_30

¹ **Bioclimatic variables:** bio02 = Mean Diurnal Range (Mean of monthly (max temp - min temp)); bio04 = Temperature Seasonality (standard deviation ×100); bio05 = Max Temperature of Warmest Month; bio06 = Min Temperature of Coldest Month; bio07 = Temperature Annual Range (BIO5-BIO6); bio08 = Mean Temperature of Wettest Quarter; bio10 = Mean Temperature of Warmest Quarter; bio13 = Precipitation of Wettest Month; bio14 = Precipitation of Driest Month; bio15 = Precipitation Seasonality (Coefficient of Variation); bio17 = Precipitation of Driest Quarter. **Soil Properties:** bdod = Bulk density; cec = Cation exchange capacity at pH 7; cfvo = Coarse fragments volumetric; clay = Clay content; nitro = Nitrogen; ocd = Organic carbon densities; phh2o = Soil pH in H2O; sand = Sand content; silt = Silt content; soc = Soil organic carbon content.

Table S4. T-test for the variation in habitat suitability (species) across four future climate change projections (2041-2060). The projections range from a more optimistic scenario to a more pessimistic one regarding greenhouse gas emissions (SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5, respectively). Negative values indicate a reduction in habitat suitability. 95% confidence interval (CI).

T test, Δ Suitability (species), n = 53					
Scenario	Estimate	CI low	CI high	t	p
SSP126	-0.049	-0.068	-0.030	-5.195	< 0.001
SSP245	-0.052	-0.074	-0.030	-4.713	< 0.001
SSP370	-0.055	-0.080	-0.030	-4.461	< 0.001
SSP585	-0.060	-0.088	-0.033	-4.409	< 0.001

Table S5. Variation in habitat suitability values of cultivated and wild species in the Brazilian Semi-arid, under current and future climate scenarios (SSPs). Mean, standard deviation (SD) and relative variation of the mean [Δ Mean (%)] of habitat suitability for each species. n = number of pixels that species occupies in the Brazilian Semi-arid region, from which the suitability values were extracted.

Species	Current		SSP1-2.6			SSP2-4.5			SSP3-7.0			SSP5-8.5			n	group
	Mean	SD	Mean	SD	Δ Mean (%)	Mean	SD	Δ Mean (%)	Mean	SD	Δ Mean (%)	Mean	SD	Δ Mean (%)		
<i>Abelmoschus esculentus</i>	0.39	0.16	0.42	0.17	7.44	0.42	0.17	7.44	0.41	0.16	5.64	0.41	0.17	5.64	53534	cultivated
<i>Acrocomia aculeata</i>	0.26	0.16	0.24	0.14	-8.11	0.24	0.14	-6.56	0.23	0.14	-12.36	0.22	0.14	-13.90	40972	wild
<i>Anacardium occidentale</i>	0.44	0.27	0.30	0.26	-30.66	0.28	0.25	-36.84	0.25	0.24	-43.48	0.22	0.24	-49.89	53534	cultivated
<i>Ananas comosus</i>	0.21	0.24	0.08	0.13	-62.98	0.06	0.11	-69.23	0.05	0.09	-74.52	0.04	0.08	-78.85	53534	cultivated
<i>Annona crassiflora</i>	0.17	0.20	0.07	0.10	-59.04	0.06	0.09	-65.06	0.05	0.08	-69.88	0.04	0.07	-74.70	48962	wild
<i>Annona muricata</i>	0.37	0.26	0.34	0.25	-8.42	0.34	0.25	-7.34	0.34	0.25	-7.88	0.33	0.25	-9.78	53534	cultivated
<i>Annona squamosa</i>	0.50	0.24	0.50	0.24	-1.20	0.50	0.24	-0.80	0.49	0.24	-1.40	0.49	0.24	-2.20	53534	cultivated
<i>Arachis hypogaea</i>	0.56	0.20	0.52	0.19	-8.69	0.51	0.18	-9.04	0.51	0.18	-10.46	0.50	0.18	-11.70	53578	cultivated
<i>Artocarpus heterophyllus</i>	0.46	0.20	0.37	0.18	-19.22	0.37	0.18	-20.95	0.36	0.17	-23.33	0.34	0.17	-25.92	53578	cultivated
<i>Attalea speciosa</i>	0.20	0.24	0.25	0.26	24.75	0.26	0.27	30.81	0.28	0.28	40.40	0.28	0.28	42.93	23581	wild
<i>Byrsonima crassifolia</i>	0.25	0.13	0.24	0.11	-6.30	0.24	0.11	-5.51	0.23	0.11	-9.45	0.23	0.11	-9.84	53534	wild
<i>Carica papaya</i>	0.45	0.24	0.46	0.23	0.44	0.46	0.23	1.32	0.46	0.23	1.10	0.46	0.23	0.66	53534	cultivated
<i>Caryocar brasiliense</i>	0.27	0.27	0.15	0.16	-42.86	0.14	0.15	-46.62	0.13	0.14	-51.13	0.12	0.13	-54.14	24003	wild
<i>Cereus jamacaru</i>	0.48	0.31	0.50	0.28	3.94	0.53	0.28	9.54	0.55	0.28	14.11	0.57	0.28	18.88	53534	wild
<i>Citrullus lanatus</i>	0.54	0.18	0.52	0.18	-3.16	0.52	0.18	-2.60	0.52	0.18	-2.97	0.52	0.18	-3.90	53578	cultivated
<i>Cnidioscolus quercifolius</i>	0.33	0.28	0.33	0.27	-0.90	0.33	0.27	-1.81	0.35	0.27	4.22	0.35	0.27	3.92	53154	wild
<i>Coffea arabica</i>	0.33	0.26	0.19	0.19	-43.77	0.17	0.17	-49.54	0.15	0.16	-55.02	0.13	0.15	-59.88	53578	cultivated
<i>Crateva tapia</i>	0.34	0.21	0.39	0.23	14.53	0.41	0.23	18.90	0.42	0.24	21.80	0.43	0.24	24.42	53534	wild
<i>Cucumis anguria</i>	0.53	0.22	0.50	0.22	-5.84	0.50	0.22	-5.08	0.50	0.22	-5.27	0.50	0.22	-6.40	53578	cultivated
<i>Dipteryx alata</i>	0.32	0.24	0.47	0.25	45.65	0.50	0.25	56.52	0.50	0.26	56.52	0.52	0.26	61.80	30089	wild
<i>Encholirium spectabile</i>	0.44	0.29	0.26	0.26	-40.18	0.24	0.26	-45.89	0.22	0.25	-48.86	0.20	0.24	-54.11	53287	wild
<i>Eugenia uniflora</i>	0.28	0.27	0.20	0.23	-28.98	0.19	0.22	-32.16	0.18	0.21	-36.04	0.17	0.20	-39.93	53534	cultivated
<i>Euterpe edulis</i>	0.53	0.13	0.52	0.13	-0.95	0.52	0.13	-0.95	0.52	0.13	-0.76	0.52	0.13	-0.76	53578	cultivated
<i>Hancornia speciosa</i>	0.46	0.26	0.32	0.19	-29.61	0.31	0.18	-32.02	0.30	0.17	-35.31	0.28	0.17	-38.16	53534	wild
<i>Hymenaea courbaril</i>	0.61	0.16	0.52	0.15	-14.54	0.52	0.15	-15.20	0.51	0.15	-16.83	0.50	0.16	-17.81	53576	wild
<i>Ipomoea batatas</i>	0.55	0.15	0.44	0.14	-19.60	0.43	0.14	-21.96	0.42	0.14	-24.32	0.40	0.13	-26.86	53578	cultivated

<i>Mandevilla tenuifolia</i>	0.39	0.27	0.31	0.18	-20.93	0.31	0.17	-21.19	0.31	0.16	-19.64	0.31	0.16	-19.64	53090	wild
<i>Mangifera indica</i>	0.48	0.24	0.45	0.24	-6.82	0.45	0.24	-6.20	0.46	0.24	-5.99	0.45	0.24	-7.02	53578	cultivated
<i>Manihot carthagenensis</i>	0.49	0.30	0.55	0.29	13.40	0.57	0.30	17.53	0.59	0.30	21.44	0.61	0.30	25.98	53576	wild
<i>Manihot esculenta</i>	0.49	0.24	0.52	0.23	7.41	0.54	0.23	10.70	0.56	0.23	14.81	0.57	0.23	16.87	53534	cultivated
<i>Mauritia flexuosa</i>	0.14	0.14	0.11	0.12	-22.86	0.10	0.11	-26.43	0.09	0.11	-33.57	0.09	0.11	-37.86	53474	wild
<i>Morisonia longifolia</i>	0.36	0.30	0.22	0.25	-37.54	0.20	0.24	-43.42	0.19	0.23	-47.34	0.17	0.22	-53.22	42436	wild
<i>Passiflora cincinnata</i>	0.62	0.24	0.52	0.21	-15.93	0.51	0.21	-16.59	0.51	0.21	-16.91	0.51	0.21	-17.24	53534	wild
<i>Passiflora edulis</i>	0.33	0.29	0.25	0.25	-23.56	0.25	0.25	-25.08	0.24	0.24	-27.49	0.23	0.23	-31.42	53578	cultivated
<i>Passiflora foetida</i>	0.51	0.24	0.50	0.24	-2.53	0.50	0.24	-1.75	0.51	0.24	-0.78	0.51	0.24	-0.39	53534	wild
<i>Persea americana</i>	0.56	0.16	0.46	0.16	-17.77	0.45	0.15	-19.93	0.43	0.15	-22.08	0.42	0.15	-24.42	53578	cultivated
<i>Phaseolus lunatus</i>	0.23	0.27	0.14	0.20	-39.66	0.13	0.18	-43.97	0.12	0.17	-49.57	0.10	0.16	-55.17	53534	cultivated
<i>Phaseolus vulgaris</i>	0.37	0.28	0.32	0.25	-13.39	0.32	0.26	-12.30	0.32	0.25	-12.30	0.32	0.25	-12.57	53534	cultivated
<i>Pilosocereus pachycladus</i>	0.36	0.26	0.30	0.22	-17.22	0.30	0.22	-17.22	0.30	0.22	-18.06	0.29	0.21	-20.83	25753	wild
<i>Psidium guajava</i>	0.46	0.25	0.40	0.23	-13.04	0.40	0.23	-13.70	0.39	0.23	-16.30	0.38	0.23	-17.83	53534	cultivated
<i>Psidium schenckianum</i>	0.16	0.27	0.08	0.16	-50.61	0.07	0.14	-57.32	0.06	0.12	-62.80	0.05	0.11	-67.07	47016	wild
<i>Punica granatum</i>	0.54	0.18	0.52	0.18	-3.33	0.53	0.18	-2.78	0.52	0.18	-3.15	0.52	0.18	-3.89	53578	cultivated
<i>Sarcomphalus joazeiro</i>	0.55	0.31	0.43	0.27	-21.53	0.42	0.27	-23.91	0.42	0.27	-23.91	0.40	0.27	-26.64	53534	wild
<i>Selenicereus setaceus</i>	0.38	0.28	0.34	0.28	-8.27	0.34	0.28	-9.87	0.35	0.28	-6.13	0.35	0.28	-5.87	53534	cultivated
<i>Sesamum indicum</i>	0.19	0.25	0.32	0.32	70.59	0.33	0.32	77.54	0.37	0.34	98.93	0.40	0.35	111.23	53534	cultivated
<i>Sideroxylon obtusifolium</i>	0.48	0.31	0.50	0.30	3.53	0.50	0.30	4.16	0.50	0.30	4.57	0.50	0.30	4.16	53534	wild
<i>Spondias tuberosa</i>	0.46	0.29	0.32	0.26	-30.72	0.30	0.26	-35.73	0.29	0.25	-37.25	0.27	0.24	-41.61	52871	wild
<i>Spondias venulosa</i>	0.18	0.24	0.15	0.22	-17.13	0.15	0.22	-19.34	0.14	0.22	-20.44	0.14	0.22	-23.20	43468	wild
<i>Syagrus cearensis</i>	0.33	0.26	0.20	0.20	-41.27	0.18	0.20	-46.39	0.17	0.19	-50.30	0.15	0.18	-53.92	13186	wild
<i>Syagrus coronata</i>	0.29	0.24	0.23	0.22	-22.26	0.21	0.21	-27.40	0.20	0.21	-32.53	0.18	0.20	-39.38	27957	wild
<i>Vigna unguiculata</i>	0.52	0.22	0.50	0.22	-4.43	0.50	0.22	-3.85	0.50	0.22	-4.05	0.49	0.22	-5.01	53578	cultivated
<i>Xiquexique gounellei</i>	0.46	0.25	0.33	0.23	-28.14	0.31	0.23	-32.47	0.31	0.23	-32.90	0.29	0.22	-37.23	50885	wild
<i>Zea mays</i>	0.41	0.28	0.34	0.25	-18.05	0.33	0.25	-19.02	0.33	0.25	-20.49	0.32	0.24	-23.17	53534	cultivated

Table S6. Results of linear mixed models (LMM) for the variation in habitat suitability values between groups of cultivated (CFP) and wild (WFP) species, in each future scenario (SSPs). Sample number = 53000 (26000 for CFP and 27000 for WFP).

	Estimate	Std. Error	df	t value	Pr(> t)
SSP1-2.6					
(Intercept)	-0.046	0.001	1665.459	-45.099	0.000
Group Wild	-0.001	0.001	52000.000	-1.472	0.141
SSP2-4.5					
(Intercept)	-0.048	0.001	1608.613	-40.500	0.000
Group Wild	0.001	0.001	52000.000	0.968	0.333
SSP3-7.0					
(Intercept)	-0.053	0.001	1599.196	-40.271	0.000
Group Wild	0.004	0.001	52000.000	3.142	0.002
SSP5-8.5					
(Intercept)	-0.058	0.001	1565.799	-40.107	0.000
Group Wild	0.005	0.001	52000.000	3.952	0.000

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