Supplementary Information

This PDF file includes:

Table S1. Landsat images used in the analysis.

Year of Acquisition	Path/Row	Cloud Cover	Sensor	Processing Level
1991	147/038	2.0%	Landsat 5 TM	L1TP
	148/038	2.0%	Landsat 5 TM	L1TP
1993	147/038	1.0%	Landsat 5 TM	L1TP
	148/038	1.0%	Landsat 5 TM	L1TP
1996	147/038	3.0%	Landsat 5 TM	L1TP
	148/038	0.0%	Landsat 5 TM	L1TP
1998	147/038	3.0%	Landsat 5 TM	L1TP
	148/038	1.0%	Landsat 5 TM	L1TP
2009	147/038	3.0%	Landsat 5 TM	L1TP
	148/038	1.0%	Landsat 5 TM	L1TP
2018	147/038	2.56%	Landsat 8 OLI	L1TP
	148/038	1.41%	Landsat 8 OLI	L1TP

Landsat images used in the analysis (year of acquisition, Path/Row, cloud cover, sensor, and processing level). L1TP denotes the Level-1 precision- and terrain-corrected product.

Table S2. Classification accuracies of the 1991-pair Landsat image (%).

Class (Class No.)	2DCNN
Needleleaf Open Forest (1)	**61.36±6.93**
Needleleaf Non-Forest (2)	**62.07±6.77**
Needleleaf Dense Forest (3)	**77.79±2.99**
Broadleaf Open Forest (4)	**66.48±6.61**
Broadleaf Non-Forest (5)	**63.00±5.59**
Broadleaf Dense Forest (6)	**75.13±1.95**
Pasture Non-Forest (7)	**83.53±5.96**
Mixed Open Forest (10)	**63.22±4.06**
Mixed Non-Forest (11)	**67.18±3.21**
Mixed Dense Forest (12)	**75.23±3.46**
Pasture Open Forest (15)	**59.77±14.37**
OA	**71.36±0.96**
AA	**68.61±7.59**
Kappa	**65.98±1.08**

The accuracies of 2DCNN land-cover/forest-density classification of the 1991-pair Landsat image (%).

Table S3. Classification accuracies of the 1993-pair Landsat image (%).

Class (Class No.)	2DCNN
Needleleaf Open Forest (1)	**53.89±3.49**
Needleleaf Non-Forest (2)	**54.57±4.04**
Needleleaf Dense Forest (3)	**72.95±2.08**
Broadleaf Open Forest (4)	**66.41±5.27**
Broadleaf Non-Forest (5)	**50.49±4.82**
Broadleaf Dense Forest (6)	**69.61±3.49**
Pasture Non-Forest (7)	**77.77±2.43**
Mixed Open Forest (10)	**56.56±3.36**
Mixed Non-Forest (11)	**58.36±1.69**
Mixed Dense Forest (12)	**67.40±1.33**
Pasture Open Forest (15)	**53.76±9.33**
OA	**64.99±0.83**
AA	**61.98±8.73**
Kappa	**58.11±1.00**

The accuracies of 2DCNN land-cover/forest-density classification of the 1993-pair Landsat image (%).

Table S4. Classification accuracies of the 1996-pair Landsat image (%).

Class (Class No.)	2DCNN
Needleleaf Open Forest (1)	**59.43±6.68**
Needleleaf Non-Forest (2)	**58.13±5.10**
Needleleaf Dense Forest (3)	**70.96±3.23**
Broadleaf Open Forest (4)	**71.34±7.84**
Broadleaf Non-Forest (5)	**60.28±7.77**
Broadleaf Dense Forest (6)	**78.15±4.36**
Pasture Non-Forest (7)	**78.18±6.04**
Mixed Open Forest (10)	**59.61±4.18**
Mixed Non-Forest (11)	**65.25±3.18**
Mixed Dense Forest (12)	**71.35±1.84**
Pasture Open Forest (15)	**66.96±17.90**
OA	**68.79±1.08**
AA	**67.24±7.01**
Kappa	**62.83±1.25**

The accuracies of 2DCNN land-cover/forest-density classification of the 1996-pair Landsat image (%).

Table S5. Classification accuracies of the 1998-pair Landsat image (%).

Class (Class No.)	2DCNN
Needleleaf Open Forest (1)	**58.87 ± 3.52**
Needleleaf Non-Forest (2)	**59.61 ± 5.04**
Needleleaf Dense Forest (3)	**74.46 ± 2.83**
Broadleaf Open Forest (4)	**67.79 ± 3.075**
Broadleaf Non-Forest (5)	**66.44 ± 7.55**
Broadleaf Dense Forest (6)	**73.11 ± 4.11**
Pasture Non-Forest (7)	**85.11 ± 4.07**
Mixed Open Forest (10)	**60.12 ± 8.00**
Mixed Non-Forest (11)	**65.42 ± 3.15**
Mixed Dense Forest (12)	**71.00 ± 5.26**
Pasture Open Forest (15)	**61.88 ± 7.82**
OA	**68.71 ± 2.04**
AA	**67.62 ± 7.57**
Kappa	**62.69 ± 2.58**

The accuracies of 2DCNN land-cover/forest-density classification of the 1998-pair Landsat image (%).

Table S6. Classification accuracies of the 2009-pair Landsat image (%).

Needleleaf Non-Forest (2)	**60.15 ± 5.87**
Needleleaf Dense Forest (3)	**75.58 ± 3.61**
Broadleaf Open Forest (4)	**62.53 ± 13.82**
Broadleaf Non-Forest (5)	**70.21 ± 4.13**
Broadleaf Dense Forest (6)	**66.20 ± 4.99**
Pasture Non-Forest (7)	**80.00 ± 5.51**
Mixed Open Forest (10)	**53.00 ± 9.09**
Mixed Non-Forest (11)	**64.04 ± 4.13**
Mixed Dense Forest (12)	**72.70 ± 2.78**
OA	**68.32 ± 2.03**
AA	**67.16 ± 7.86**
Kappa	**61.76 ± 2.37**

The accuracies of 2DCNN land-cover/forest-density classification of the 2009-pair Landsat image (%).

Table S7. Classification accuracies of the 2018-pair Landsat image (%).

Class (Class No.)	2DCNN
Needleleaf Open Forest (1)	**52.94 ± 7.20**
Needleleaf Non-Forest (2)	**62.64 ± 9.48**
Needleleaf Dense Forest (3)	**74.68 ± 6.47**
Broadleaf Open Forest (4)	**58.80 ± 6.01**
Broadleaf Non-Forest (5)	**66.34 ± 4.45**
Broadleaf Dense Forest (6)	**71.65 ± 2.99**
Pasture Non-Forest (7)	**83.73 ± 5.16**
Mixed Open Forest (10)	**56.45 ± 4.15**
Mixed Non-Forest (11)	**70.42 ± 3.97**
Mixed Dense Forest (12)	**72.86 ± 2.52**
OA	**70.33 ± 0.98**
AA	**67.05 ± 8.95**
Kappa	**63.44 ± 1.30**

The accuracies of 2DCNN land-cover/forest-density classification of the 2018-pair Landsat image (%).

Table S8. Change summary for the composite land-cover/forest-density classes.

Years	Class with the largest change in extent (# of pixels)	Classes with the largest net increase and net decrease in extent (# of pixels)	Class with the largest change in extent (% of pixels)	Classes with the largest net increase and net decrease in extent (in %)
1991 to 1993	Mixed Non-Forest-Class 11 (3435, 3.09 km^2)	Mixed Open Forest -Class 10 (+1196, +1.08 km^2) Needleleaf Non-Forest -Class 2 (-598, -0.54 km^2)	Needleleaf Open Forest -Class 1 (71.99%)	Pasture Open Forest-Class 15 (+143.85%) Needleleaf Open Forest-Class 1 (-23.46%)
1993 to 1996	Broadleaf Dense Forest-Class 6 (3798, 3.42 km^2)	Mixed Non-Forest-Class 11 (+1577, +1.42 km^2) Broadleaf Dense Forest-Class 6 (-1589, -1.43 km^2)	Pasture Open Forest-Class 15 (83.91%)	Needleleaf Non-Forest -Class 2 (+23.19%) Pasture Open Forest-Class 15 (-77.29%)
1996 to 1998	Mixed Non-Forest-Class 11 (4.48 km^2)	Broadleaf Dense Forest-Class 6 (+3.15 km^2) Mixed Dense Forest-Class 12 (-1.92 km^2)	Needleleaf Non-Forest -Class 2 (76.63%)	Pasture Open Forest-Class 15 (+172.22%) Needleleaf Non-Forest -Class 2 (-25.63%)
1998 to 2009	Broadleaf Dense Forest-Class 6 (4.84 km^2)	Needleleaf Non-Forest -Class 2 (+1.61 km^2) Mixed Open Forest-Class 10 (-1.31 km^2)	Broadleaf Open Forest-Class 4 (92.00%)	Needleleaf Non-Forest -Class 2 (+88.81%) Broadleaf Open Forest-Class 4 (-77.65%)
2009 to 2018	Mixed Non-Forest-Class 11 (6.18 km^2)	Mixed Dense Forest-Class 12 (+6.17 km^2) Mixed Non-Forest-Class 11 (-4.62 km^2)	Needleleaf Non-Forest -Class 2 (94.81%)	Broadleaf Open Forest -Class 4 (+190.97%) Needleleaf Non-Forest -Class 2 (-81.14%)
1991 to 2018	*Mixed Non-Forest-Class 11 (*5.08 km^2*)*	*Mixed Dense Forest-Class 12 (*+4.10 km^2*) Mixed Non-Forest-Class 11 (*-3.23 km^2*)*	*Needleleaf Non-Forest -Class 2 (94.59%)*	*Needleleaf Open Forest -Class 1 (+47.80%) Needleleaf Non-Forest -Class 2 (-74.36%)*

Summary of those composite land-cover/forest-density classes that underwent the largest changes between successive intervals. Only the most changed class is considered for each statistical variable, and only those classes that existed in both Landsat image-mosaic years are considered for the change-detection analysis. A positive difference means the class size increased, and a negative difference means the class size decreased.

Table S9. Classification accuracies of the 1991-pair Landsat image mosaic (%).

Class	2DCNN
Needleleaf Forest	**86.01±2.50**
Broadleaf Forest	**84.65±2.99**
Mixed Forest	**84.62±1.84**
Pasture	**85.93±3.45**
OA	**84.91±1.38**
AA	**85.30±0.66**
Kappa	**76.10±2.17**

The accuracies of 2DCNN land-cover classification of the 1991-pair Landsat image mosaic (%).

Table S10. Classification accuracies of the 1993-pair Landsat image mosaic (%).

Class	2DCNN
Needleleaf Forest	**86.61±3.73**
Broadleaf Forest	**83.79±3.01**
Mixed Forest	**84.41±1.29**
Pasture	**86.54±5.26**
OA	**84.73±0.88**
AA	**85.34±1.25**
Kappa	**75.80±1.33**

The accuracies of 2DCNN land-cover classification of the 1993-pair Landsat image mosaic (%).

Table S11. Classification accuracies of the 1996-pair Landsat image mosaic (%).

Class	2DCNN
Needleleaf Forest	**82.89±2.66**
Broadleaf Forest	**83.27±3.05**
Mixed Forest	**82.67±2.62**
Pasture	**85.05±3.68**
OA	**82.73±1.02**
AA	**83.47±0.94**
Kappa	**72.49±1.95**

The accuracies of 2DCNN land-cover classification of the 1996-pair Landsat image mosaic (%).

Table S12. Classification accuracies of the 1998-pair Landsat image mosaic (%).

Class	2DCNN
Needleleaf Forest	**85.51±4.01**
Broadleaf Forest	**75.13±5.07**
Mixed Forest	**84.69±1.69**
Pasture	**86.95±6.69**
OA	**82.50±1.29**
AA	**83.07±4.65**
Kappa	**72.47±2.06**

The accuracies of 2DCNN land-cover classification of the 1998-pair Landsat image mosaic (%).

Table S13. Classification accuracies of the 2009-pair Landsat image mosaic (%).

Class	2DCNN
Needleleaf Forest	**85.38±3.35**
Broadleaf Forest	**82.83±2.41**
Mixed Forest	**82.81±1.29**
Pasture	**82.40±3.87**
OA	**83.25±0.87**
AA	**83.36±1.18**
Kappa	**73.50±1.33**

The accuracies of 2DCNN land-cover classification of the 2009-pair Landsat image mosaic (%).

Table S14. Classification accuracies of the 2018-pair Landsat image mosaic (%).

Class	2DCNN
Needleleaf Forest	**80.75±2.62**
Broadleaf Forest	**84.25±2.91**
Mixed Forest	**81.19±2.13**
Pasture	**87.71±3.29**
OA	**81.78±0.79**
AA	**83.48±2.79**
Kappa	**70.95±1.48**

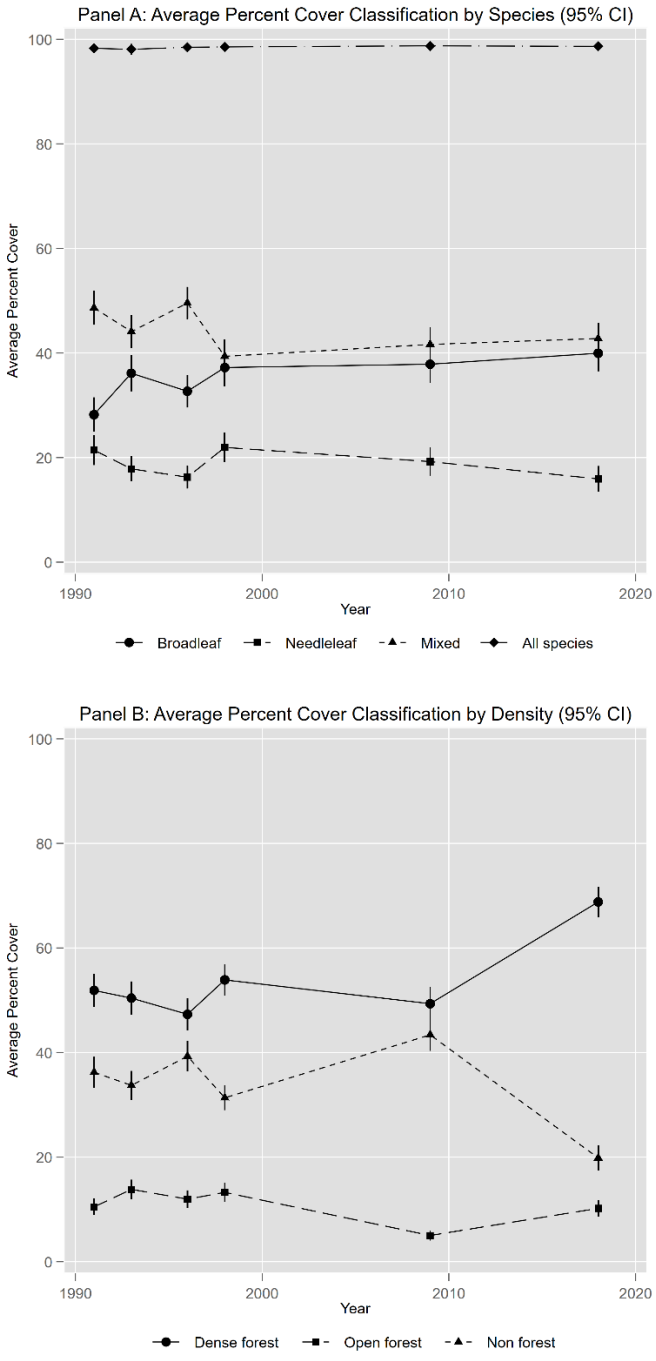
The accuracies of 2DCNN land-cover classification of the 2018-pair Landsat image mosaic (%).

Table S15. Land change summary measures based on image classifications.

Years	Class Changes (Most changed) in Pixel Count	Image Differences (Most changed) in Pixel Count	Class Changes (Most changed) in Percentage	Image Differences (Most changed) in Percentage
1991 to 1993	Needleleaf Forest (1267)	Broadleaf (+457) Needleleaf Forest (-415)	Needleleaf Forest (29.85%)	Pasture (+14.21%) Needleleaf Forest (-9.78%)
1993 to 1996	Mixed Forest (1756)	Mixed Forest (+284) Needleleaf Forest (-275)	Pasture (36.68%)	Mixed Forest (+2.67%) Needleleaf Forest (-7.42%)
1996 to 1998	Mixed Forest (2598)	Pure Needle (+791) Mixed Forest (-513)	Broadleaf Forest (41.00%)	Needleleaf Forest (+22.25%) Pasture (-7.90%)
1998 to 2009	Mixed Forest (2333)	Pure Broad (+457) Mixed Forest (-319)	Pasture (40.72%)	Broadleaf Forest (+12.31%) Pasture (-16.52%)
2009 to 2018	Mixed Forest (2105)	Broadleaf Forest (+802) Needleleaf Forest (-601)	Pasture (44.479%)	Broadleaf Forest (+19.23%) Needleleaf Forest (-13.86%)
1991 to 2018	*Mixed Forest (2850)*	*Broadleaf Forest (+1564)* *Mixed Forest (-815)*	/	*Broadleaf Forest (+45.89%)* *Pasture (-29.93%)*

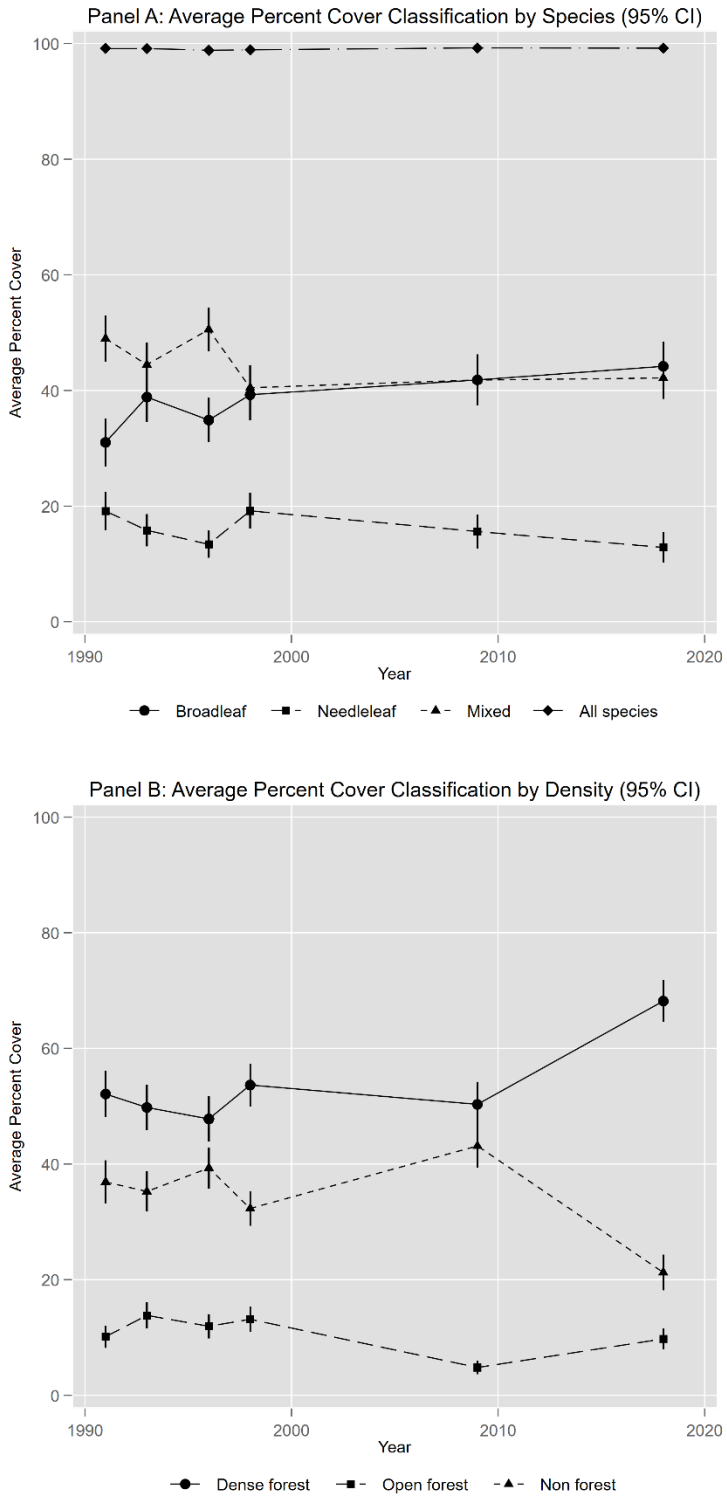
Summary measures of land change across the 60 plantations from 1991 to 2018, based on the land-cover classified images. Specifically, this table provides a summary of those land-cover classes that underwent the largest changes between successive intervals. Only the most changed class is considered for each statistical variable. Class Changes refers to the total number of initial state pixels that changed classes. Image Differences is the difference in the total number of equivalently-classed pixels in the two images, computed by subtracting the Initial State Class from the Final State Class Totals. A positive difference means the class size increased, and a negative difference means the class size decreased.

Fig. S1. Average forest cover trends across plantation areas.



This figure presents the average value of each forest cover classification across all plantation areas in our sample within each year. We use points to represent the timing of our actual measurements and connect them with lines to help readers visualize trends. Spikes around the points represent 95% confidence intervals for our estimates.

Fig. S2. Average forest cover trends across plantation areas not yet established in 1991



This figure presents the same information as Fig. S1 but calculated in a restricted sample: plantation areas that did not yet have an established plantation on them in 1991.

Fig. S3. Histogram of the number of plantations in all 60 panchayats

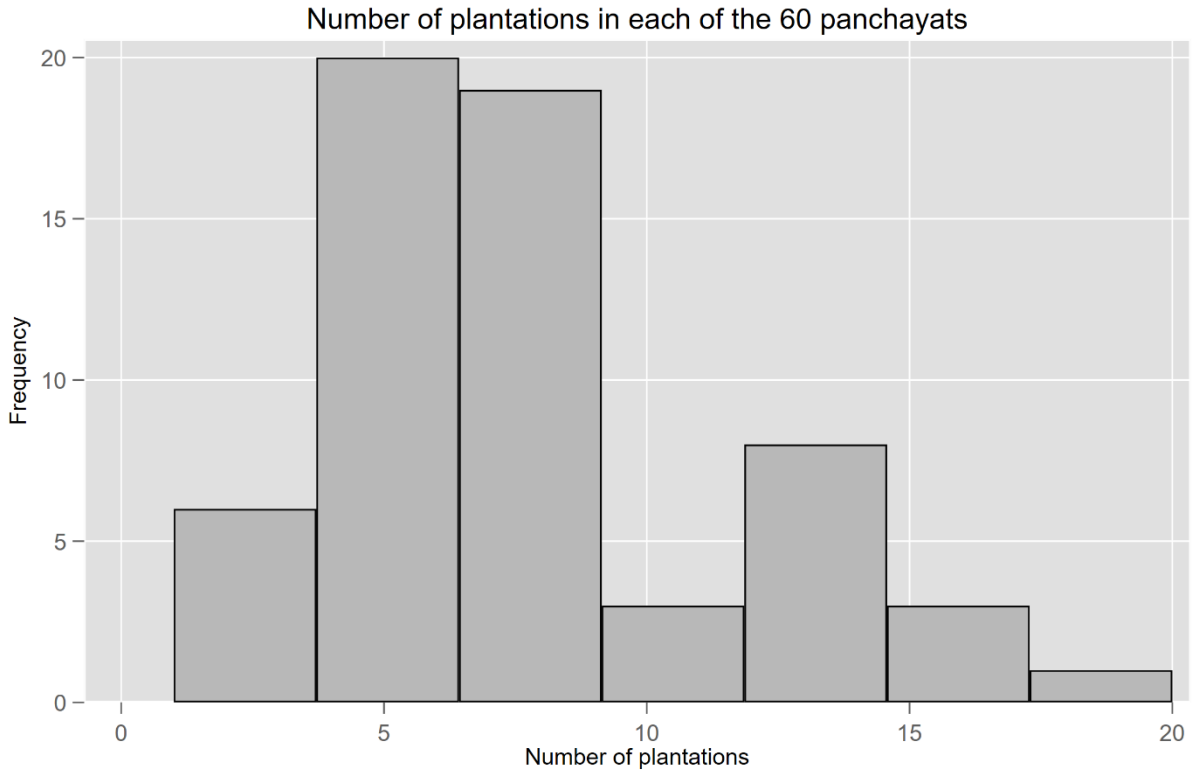


Fig. S4. Dense forest cover over time for each plantation in one study panchayat

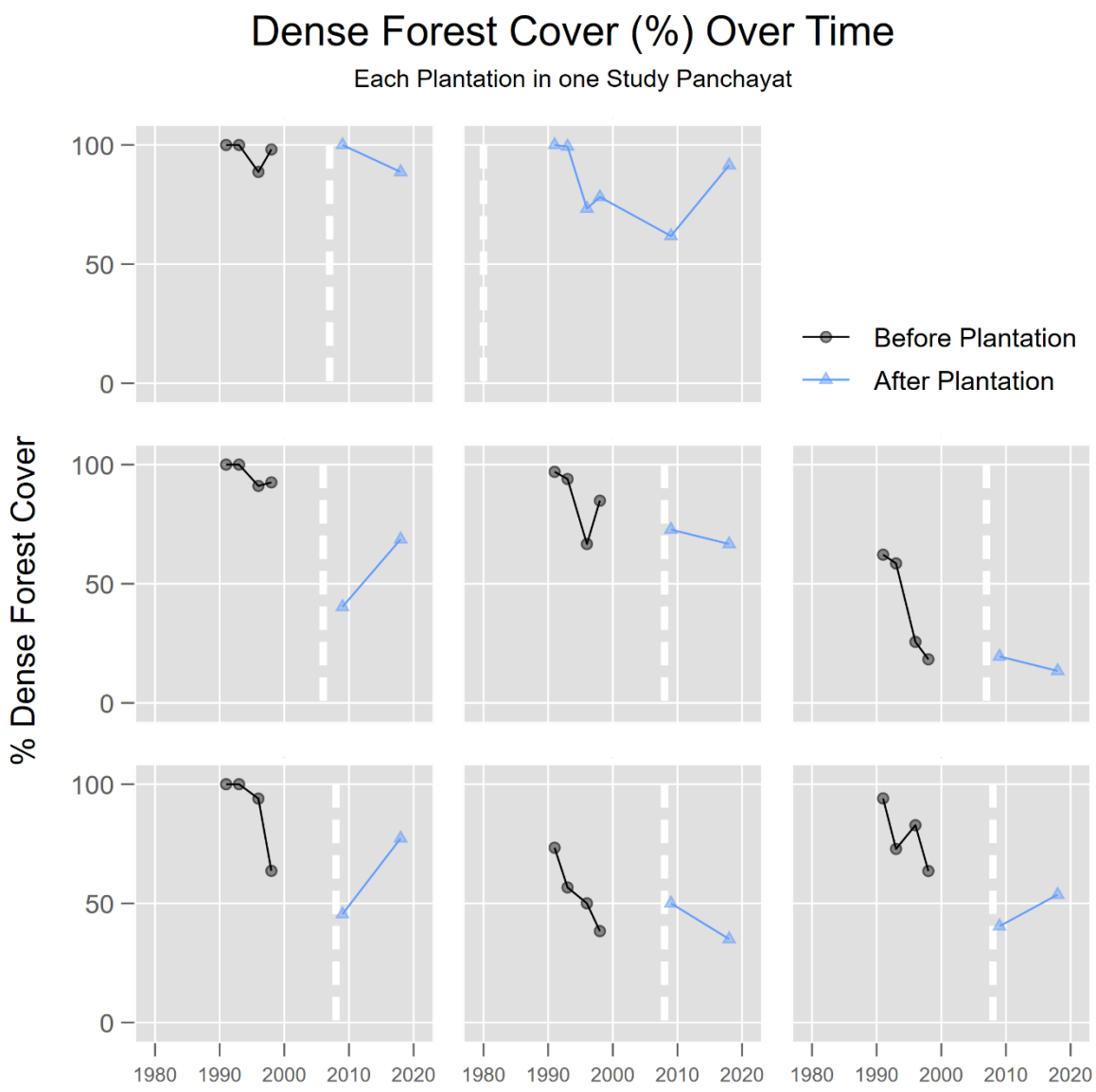


Table S16. Dense forest cover regression results

	(1) Model 1 b/se	(2) Model 2 b/se	(3) Model 3 b/se	(4) Model 4 b/se
After Plantation	-0.606	2.133		4.876
	(2.29)	(2.27)		(3.32)
After Plantation x Plantation Age		0.089		-0.110
		(0.20)		(0.96)
After Plantation x Plantation Age^2				0.036
				(0.04)
Plantation Age		-0.191		-0.478
		(0.20)		(0.69)
Plantation Age^2				-0.014
				(0.03)
sqrt(Distance)	-0.043	-0.031	-0.071	-0.036
	(0.53)	(0.53)	(0.52)	(0.53)
log(Area)	4.516**	4.931**	5.096**	4.861**
	(1.72)	(1.83)	(1.82)	(1.84)
sqrt(Distance) x log(Area)	0.129	0.083	0.122	0.086
	(0.59)	(0.59)	(0.59)	(0.59)
log(Slope)	5.858	5.747	5.924	5.732
	(4.64)	(4.61)	(4.56)	(4.61)
log(Elevation)	27.538**	27.580**	27.607**	27.690**
	(10.26)	(10.24)	(10.18)	(10.24)
log(Slope) x log(Elevation)	-43.686***	-43.783***	-43.541***	-43.879***
	(11.25)	(11.18)	(11.12)	(11.19)
Constant	43.040***	41.400***	42.798***	40.423***
	(5.76)	(5.77)	(6.56)	(6.07)
Plantation Age FE	*No*	*No*	*Yes*	*No*
Panchayat-Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Plantations	430	430	430	430
Total Obs.	2580	2580	2580	2580
R-Squared	0.464	0.464	0.475	0.465

Dense forest cover regression results for models described in the main text (Models 2-3), a model that simply includes a binary term for active plantations (Model 1), and a model that considers a quadratic effect of Plantation Age (Model 4). Estimates in the table above are coefficient estimates, with standard errors (clustered at the plantation level) in parentheses.

We use a Wald test to explore whether the effect of Plantation Age in Model 2 differs in the pre- and post-establishment periods. This yields a F-statistic of 0.58, and a p-value of 0.447.

Table S17. Broadleaf species cover regression results

	(1) Model 1 b/se	(2) Model 2 b/se	(3) Model 3 b/se	(4) Model 4 b/se
After Plantation	-5.395***	-1.801		-3.096
	(1.61)	(1.91)		(2.81)
After Plantation x Plantation Age		-0.824***		1.563*
		(0.20)		(0.74)
After Plantation x Plantation Age^2				-0.008
				(0.03)
Plantation Age		0.197		-0.905
		(0.15)		(0.52)
Plantation Age^2				-0.050*
				(0.02)
sqrt(Distance)	2.332***	2.325***	2.345***	2.311***
	(0.40)	(0.40)	(0.40)	(0.40)
log(Area)	0.601	1.036	0.769	0.850
	(1.59)	(1.61)	(1.57)	(1.58)
sqrt(Distance) x log(Area)	-0.650	-0.688	-0.619	-0.651
	(0.40)	(0.40)	(0.41)	(0.41)
log(Slope)	0.838	0.569	0.700	0.705
	(3.30)	(3.29)	(3.28)	(3.30)
log(Elevation)	-53.811***	-52.769***	-53.493***	-53.195***
	(11.25)	(11.14)	(10.83)	(11.14)
log(Slope) x log(Elevation)	22.028*	21.289*	21.766*	21.306*
	(10.49)	(10.54)	(10.50)	(10.61)
Constant	28.739***	31.746***	30.111***	28.489***
	(5.56)	(5.46)	(5.86)	(5.29)
Plantation Age FE	*No*	*No*	*Yes*	*No*
Panchayat-Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Plantations	430	430	430	430
Total Obs.	2580	2580	2580	2580
R-Squared	0.464	0.464	0.475	0.465

Broadleaf species cover regression results for models described in the main text (Models 2-3), a model that simply includes a binary term of active plantations (Model 1), and a model that considers a quadratic effect of Plantation Age (Model 4). Estimates in the table above are coefficient estimates, with standard errors (clustered at the plantation level) in parentheses.

We use a Wald test to explore whether the effect of Plantation Age in Model 2 differs in the pre- and post-establishment periods. This yields a F-statistic of 10.69, and a p-value of 0.001.

Table S18. Needleleaf species cover regression results

	(1) Model 1 b/se	(2) Model 2 b/se	(3) Model 3 b/se	(4) Model 4 b/se
After Plantation	4.466*	-0.721		2.682
	(2.05)	(1.75)		(2.45)
After Plantation x Plantation Age		0.588**		0.801
		(0.20)		(0.83)
After Plantation x Plantation Age^2				0.046
				(0.03)
Plantation Age		0.001		-0.604
		(0.15)		(0.59)
Plantation Age^2				-0.028
				(0.03)
sqrt(Distance)	-1.638***	-1.643***	-1.642***	-1.652***
	(0.41)	(0.41)	(0.42)	(0.42)
log(Area)	0.640	-0.057	-0.011	-0.187
	(1.62)	(1.62)	(1.63)	(1.63)
sqrt(Distance) x log(Area)	-0.476	-0.407	-0.428	-0.396
	(0.42)	(0.42)	(0.42)	(0.42)
log(Slope)	-8.059	-7.751	-7.836	-7.744
	(4.36)	(4.38)	(4.38)	(4.39)
log(Elevation)	19.595*	18.722*	18.459*	18.784*
	(8.56)	(8.37)	(8.38)	(8.40)
log(Slope) x log(Elevation)	-37.294***	-36.619***	-36.614***	-36.744***
	(9.71)	(9.81)	(9.83)	(9.82)
Constant	25.542***	24.493***	24.704***	22.535***
	(5.14)	(5.13)	(5.38)	(5.09)
Plantation Age FE	*No*	*No*	*Yes*	*No*
Panchayat-Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Plantations	430	430	430	430
Total Obs.	2580	2580	2580	2580
R-Squared	0.464	0.464	0.475	0.465

Needleleaf species cover regression results for models described in the main text (Models 2-3), a model that simply includes a binary term of active plantations (Model 1), and a model that considers a quadratic effect of Plantation Age (Model 4). Estimates in the table above are coefficient estimates, with standard errors (clustered at the plantation level) in parentheses.

We use a Wald test to explore whether the effect of Plantation Age in Model 2 differs in the pre- and post-establishment periods. This yields a F-statistic of 3.74, and a p-value of 0.0536.

Table S19. Mixed species cover regression results

	(1) Model 1 b/se	(2) Model 2 b/se	(3) Model 3 b/se	(4) Model 4 b/se
After Plantation	-0.578	1.866		-0.002
	(2.21)	(2.20)		(2.97)
After Plantation x Plantation Age		0.236		-2.408**
		(0.19)		(0.92)
After Plantation x Plantation Age^2				-0.035
				(0.03)
Plantation Age		-0.244		1.453*
		(0.18)		(0.62)
Plantation Age^2				0.078*
				(0.03)
sqrt(Distance)	-1.667**	-1.653**	-1.678**	-1.630**
	(0.55)	(0.55)	(0.55)	(0.55)
log(Area)	-0.382	0.006	0.222	0.318
	(1.64)	(1.73)	(1.74)	(1.73)
sqrt(Distance) x log(Area)	0.430	0.385	0.347	0.337
	(0.70)	(0.71)	(0.70)	(0.71)
log(Slope)	9.125	9.047	9.006	8.902
	(5.22)	(5.23)	(5.21)	(5.25)
log(Elevation)	18.283	18.156	19.374	18.534
	(10.70)	(10.76)	(10.50)	(10.71)
log(Slope) x log(Elevation)	17.052	17.067	16.445	17.167
	(12.13)	(12.16)	(12.07)	(12.23)
Constant	46.139***	43.819***	45.379***	48.992***
	(6.11)	(6.07)	(6.39)	(6.08)
Plantation Age FE	*No*	*No*	*Yes*	*No*
Panchayat-Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Plantations	430	430	430	430
Total Obs.	2580	2580	2580	2580
R-Squared	0.464	0.464	0.475	0.465

Mixed species cover regression results for models described in the main text (Models 2-3), a model that simply includes a binary term of active plantations (Model 1), and a model that considers a quadratic effect of Plantation Age (Model 4). Estimates in the table above are coefficient estimates, with standard errors (clustered at the plantation level) in parentheses.

We use a Wald test to explore whether the effect of Plantation Age in Model 2 differs in the pre- and post-establishment periods. This yields a F-statistic of 2.16, and a p-value of 0.142.

Table S20. Open forest cover regression results

	(1) Model 1 b/se	(2) Model 2 b/se	(3) Model 3 b/se	(4) Model 4 b/se
After Plantation	0.907	0.088		0.760
	(1.19)	(1.86)		(2.21)
After Plantation x Plantation Age		0.183		0.733
		(0.16)		(0.53)
After Plantation x Plantation Age^2				0.011
				(0.02)
Plantation Age		-0.043		-0.437
		(0.15)		(0.38)
Plantation Age^2				-0.018
				(0.02)
sqrt(Distance)	-0.127	-0.125	-0.113	-0.131
	(0.23)	(0.23)	(0.24)	(0.23)
log(Area)	-1.512	-1.612	-1.857	-1.686
	(0.98)	(0.99)	(0.99)	(0.99)
sqrt(Distance) x log(Area)	-0.233	-0.224	-0.218	-0.214
	(0.28)	(0.29)	(0.29)	(0.29)
log(Slope)	0.066	0.126	0.019	0.156
	(1.86)	(1.85)	(1.83)	(1.83)
log(Elevation)	-0.397	-0.629	-0.386	-0.699
	(4.41)	(4.41)	(4.42)	(4.39)
log(Slope) x log(Elevation)	8.564*	8.729*	8.827*	8.698*
	(3.76)	(3.75)	(3.79)	(3.75)
Constant	10.348***	9.689**	9.712**	8.477**
	(2.80)	(3.12)	(3.67)	(3.21)
Plantation Age FE	*No*	*No*	*Yes*	*No*
Panchayat-Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Plantations	430	430	430	430
Total Obs.	2580	2580	2580	2580
R-Squared	0.464	0.464	0.475	0.465

Open forest cover regression results for models described in the main text (Models 2-3), a model that simply includes a binary term of active plantations (Model 1), and a model that considers a quadratic effect of Plantation Age (Model 4). Estimates in the table above are coefficient estimates, with standard errors (clustered at the plantation level) in parentheses.

We use a Wald test to explore whether the effect of Plantation Age in Model 2 differs in the pre- and post-establishment periods. This yields a F-statistic of 0.59, and a p-value of 0.441.

Table S21. Non-forest-cover regression results

	(1) Model 1 b/se	(2) Model 2 b/se	(3) Model 3 b/se	(4) Model 4 b/se
After Plantation	-1.814	-3.034		-6.052
	(2.02)	(2.09)		(3.09)
After Plantation x Plantation Age		-0.305		-0.923
		(0.18)		(0.82)
After Plantation x Plantation Age^2				-0.043
				(0.03)
Plantation Age		0.211		0.979
		(0.18)		(0.62)
Plantation Age^2				0.036
				(0.03)
sqrt(Distance)	-0.752	-0.764	-0.738	-0.752
	(0.44)	(0.44)	(0.44)	(0.44)
log(Area)	-2.231	-2.446	-2.379	-2.290
	(1.45)	(1.54)	(1.53)	(1.55)
sqrt(Distance) x log(Area)	-0.603	-0.577	-0.624	-0.594
	(0.43)	(0.43)	(0.42)	(0.44)
log(Slope)	-3.493	-3.479	-3.592	-3.508
	(4.54)	(4.53)	(4.51)	(4.53)
log(Elevation)	-42.368***	-42.109***	-42.120***	-42.094***
	(7.66)	(7.66)	(7.62)	(7.69)
log(Slope) x log(Elevation)	36.706***	36.576***	36.247***	36.692***
	(9.63)	(9.61)	(9.55)	(9.60)
Constant	46.784***	48.969***	47.733***	51.402***
	(4.84)	(4.98)	(5.59)	(5.15)
Plantation Age FE	*No*	*No*	*Yes*	*No*
Panchayat-Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Plantations	430	430	430	430
Total Obs.	2580	2580	2580	2580
R-Squared	0.464	0.464	0.475	0.465

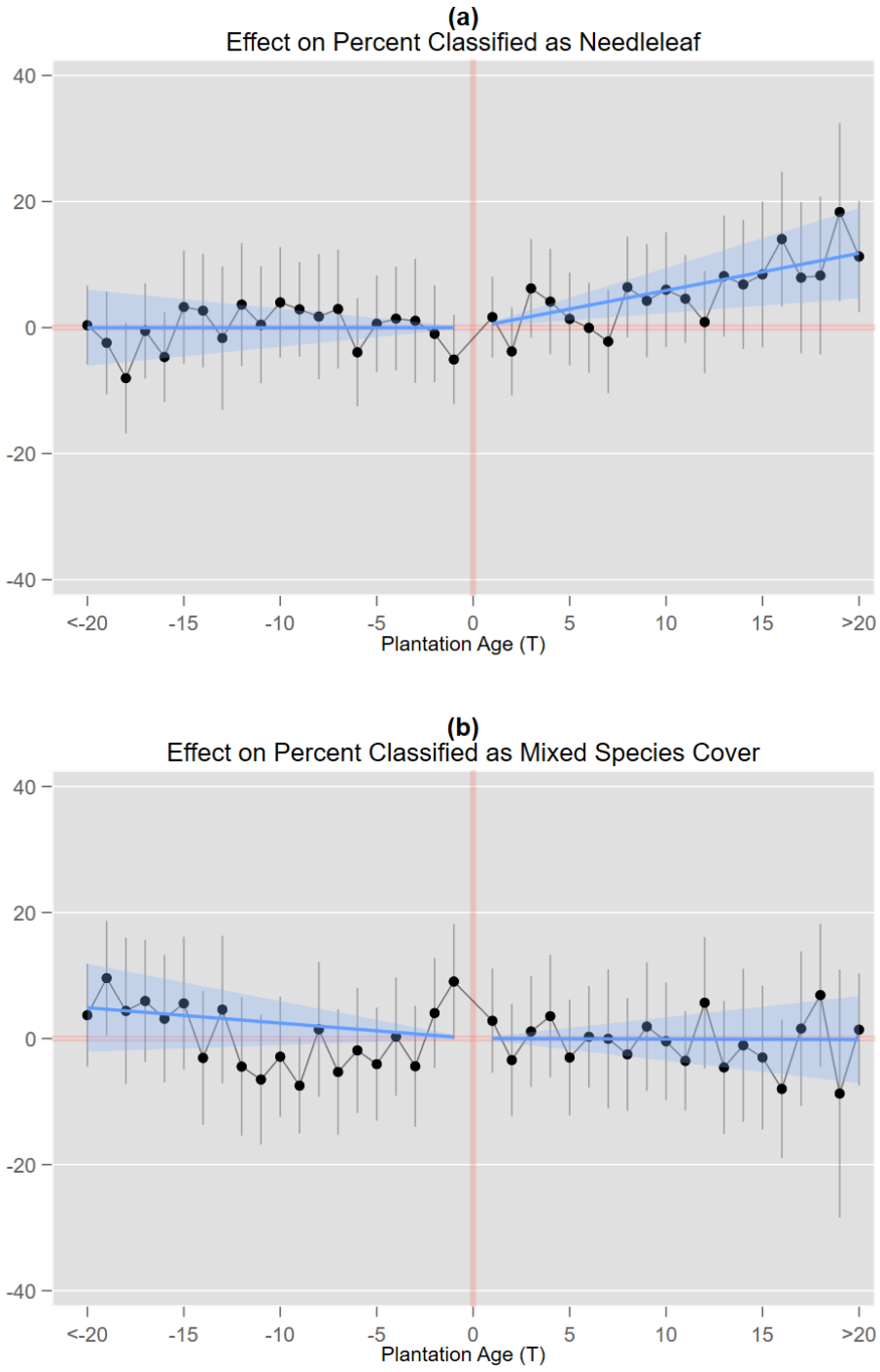
Non-forest-cover regression results for models described in the main text (Models 2-3), a model that simply includes a binary term of active plantations (Model 1), and a model that considers a quadratic effect of Plantation Age (Model 4). Estimates in the table above are coefficient estimates, with standard errors (clustered at the plantation level) in parentheses.

We use a Wald test to explore whether the effect of Plantation Age in Model 2 differs in the pre- and post-establishment periods. This yields a F-statistic of 2.38, and a p-value of 0.124.

Table S22. Summary statistics for variables in forest cover regressions

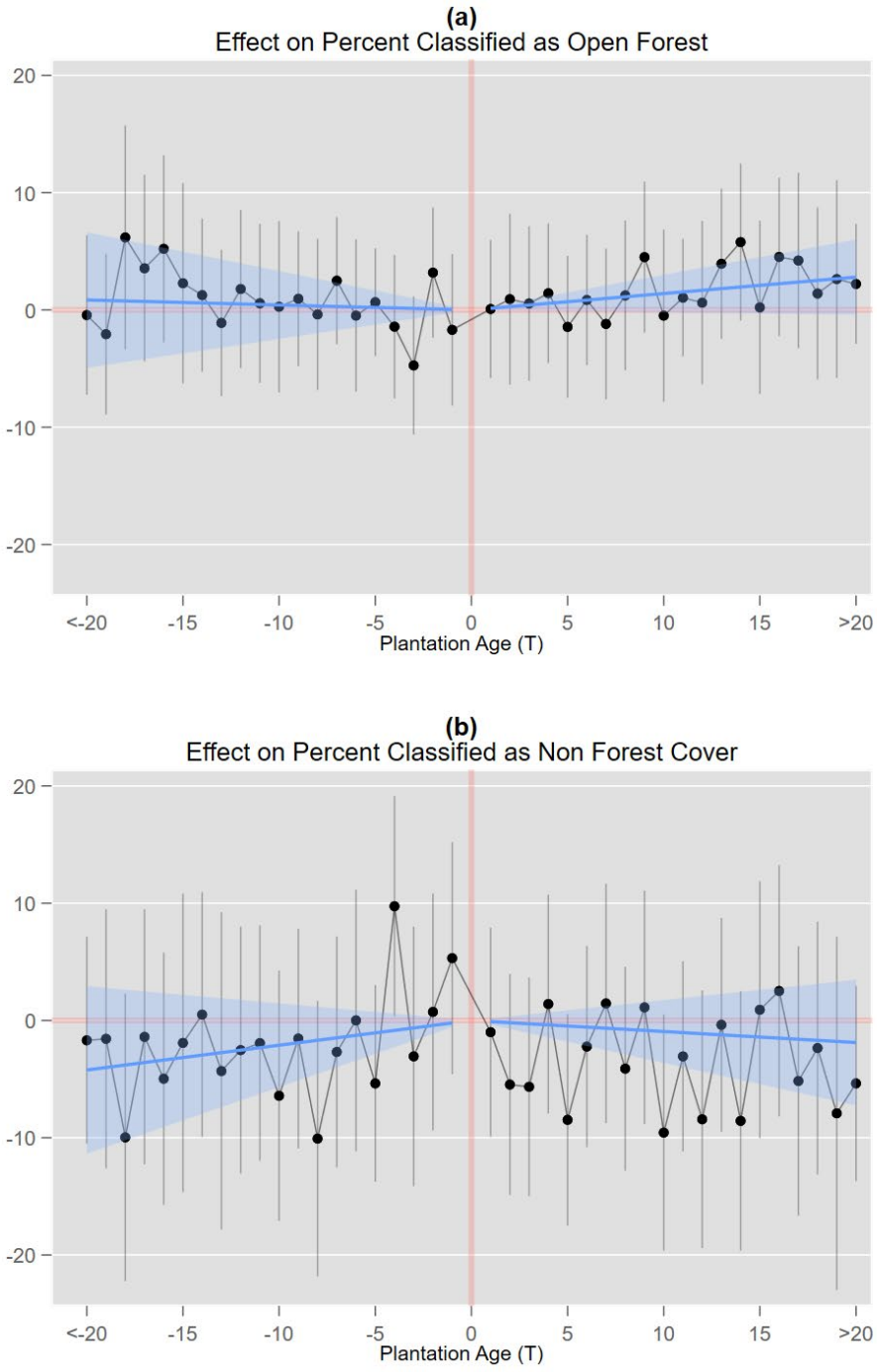
Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
Percent dense	2580	53.607	33.142	0	100	0	100	-.12	1.641
Percent broadleaf	2580	35.347	36.144	0	100	0	100	.67	1.932
After Plantation	2580	.54	.498	0	1	0	1	-.162	1.026
Plantation Age	2580	.991	13.08	-20	20	-20	20	-.117	1.819
Distance to road (minutes)	2580	13.598	33.916	0	220	0	180	3.929	18.893
sqrt(Distance)	2580	2.089	3.039	0	14.832	0	13.416	1.971	7.179
Area (hectares)	2580	8.401	5.52	.1	40	.5	30	2.374	10.82
log(Area)	2580	1.943	.668	-2.303	3.689	-.693	3.401	-1.72	12.879
Slope	2580	19.099	7.573	2.49	43.223	3.645	37.889	.628	3.265
log(slope)	2580	2.862	.445	.912	3.766	1.293	3.635	-1.04	5.7
Elevation	2580	1048.491	460.992	523.591	2807.74	562.531	2423.862	1.32	3.955
log(elevation)	2580	6.875	.384	6.261	7.94	6.332	7.793	.777	2.47

Fig. S5. Impact of tree planting on other species cover classifications



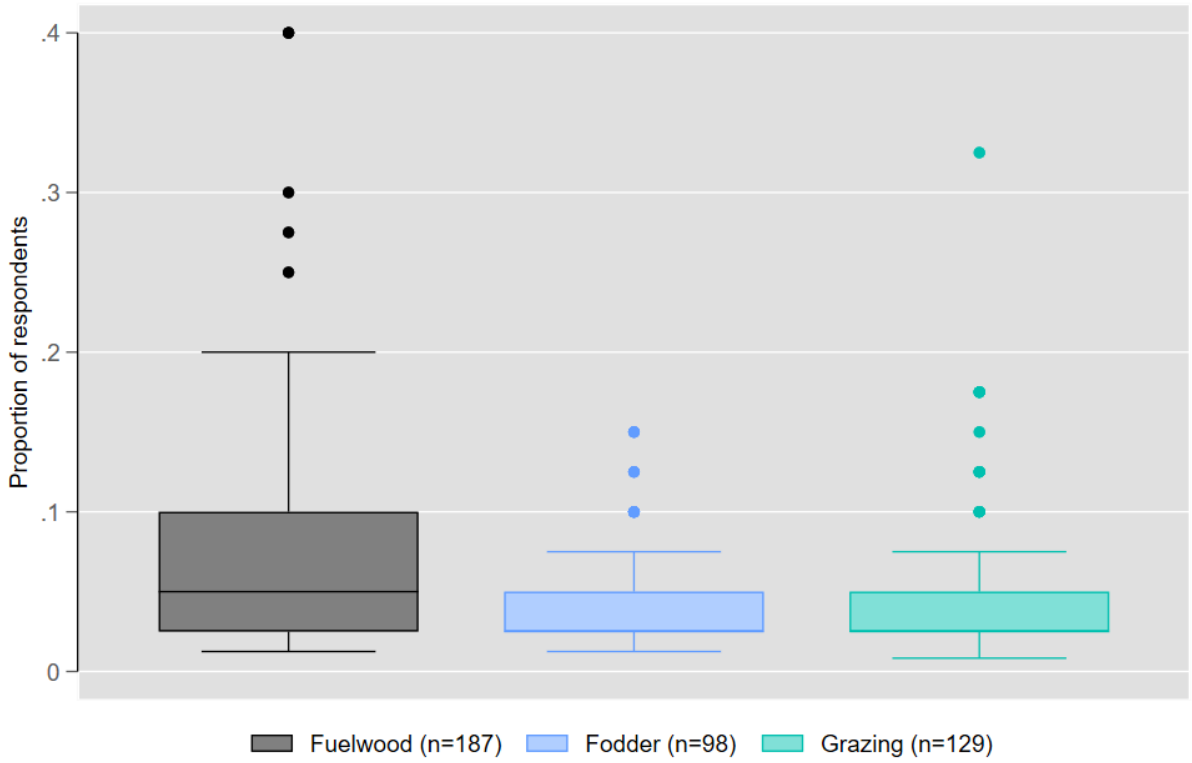
This figure replicates Figure 3 from the main text for the other species cover classifications: needleleaf species cover and mixed species cover (both needleleaf and broadleaf).

Fig. S6. Impact of tree planting on other forest-density classifications



This figure replicates Figure 3 from the main text for the other forest-density classifications: open forest area (between 40% and 10% forest cover); and non forest (<10% forest cover).

Fig. S8. Box plots of the proportion of plantation users



Box plots illustrating variation in the proportion of respondents who use each plantation. The count of plantations with 1 or more users for each purpose in our sample are listed in parentheses.

Table S23. Summary information on plantation use and dependence

Proportions (with confidence intervals) for use of and dependence on plantations

	Proportion	Std. Err.	95% CI, lower	95% CI, upper
Panel A: Plantation use (n=2,400)				
0	0.576	0.010	0.556	0.596
1	0.424	0.010	0.404	0.444
Panel B: Dependence (n=1,017)				
0	0.906	0.009	0.886	0.922
1	0.094	0.009	0.078	0.114
Panel C: Use one or two plantations (n=1,017)				
0	0.087	0.009	0.071	0.105
1	0.913	0.009	0.895	0.929

For each of the 2,400 respondents to our household surveys, we construct a binary variable representing whether they use at least one plantation in this region (including plantations in our sample that were not selected for remote sensing) for one of the three uses discussed in the main text: fuelwood collection, fodder collection, and grazing. We call this *Plantation Use*. Roughly half of respondents use at least one plantation for at least one of those three purposes. Panel A shows the proportion of respondents with different values of this variable, along with standard errors and confidence intervals.

Next, we construct a variable called *Dependence* for the 1,017 respondent who received a value of 1 for *Plantation Use*. We base this variable on a survey question asking respondents how much they depend on each plantation in their panchayat. There were five possible responses: *not dependent*; *low*; *medium*; *high*; *no response*. The variable *Dependence* takes a value of 1 for respondents who indicate that their dependence on plantations is either *moderate* or *high*. Panel B shows the proportion of respondents with different values of this variable, along with standard errors and confidence intervals.

Finally, for those same 1,017 respondents, we also tabulate the number of different plantations their household uses for fuelwood, fodder, or grazing. Those tabulations are available in Table S24. Panel C shows the proportion of respondents who only use one or two plantations for these purposes, along with standard errors and confidence intervals.

Table S24. Number of plantations used by households

Number of plantations a household uses for fuel, fodder, or grazing	Frequency	Percent	Cumulative
1	698	68.63	68.63
2	231	22.71	91.35
3	63	6.19	97.54
4	14	1.38	98.92
5	8	0.79	99.71
6	1	0.10	99.80
7	2	0.20	100.00
Total	1017	100.00	

Across all respondents who use at least one plantation for fuelwood, fodder, or grazing, we tabulated the total number of plantations their household uses for those three purposes. In other words, for each household in our survey, we count the number of *household-plantation* pairs that involve plantation use for fuelwood, fodder, or grazing.

The result shows that although some outlier households use multiple plantations for the three benefits we highlight, by and large most households use only one or two. Table S23 presents confidence intervals for the proportion of households using only one or two plantations for these benefits.

Table S25. Negative binomial regression table for results reported in Table 1

Household use of plantations--Negative binomial models

	(1) Fuel	(2) Fodder	(3) Grazing
Plantation age	0.0196**	0.00278	0.0249**
	(0.00739)	(0.00800)	(0.00790)
sqrt(Distance)	-0.108**	-0.0872**	-0.0468
	(0.0313)	(0.0333)	(0.0303)
log(Area)	0.403**	0.262	0.106
	(0.155)	(0.160)	(0.164)
Constant	-2.776**	-3.209**	-3.587**
	(0.471)	(0.510)	(0.500)
Panchayat FE	Yes	Yes	Yes
N	430	430	430

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Coefficient estimates from intra-panchayat negative binomial regression results (i.e., regression results using panchayat fixed effects and a limited sample of explanatory variables). Panel A results in Table 1 in the main text are transformations of these coefficients (see our Materials and Methods). Panel B results are calculated using these coefficients.

Table S26. Summary statistics for livelihood explanatory variables

Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
Plantation age	430	20.909	11.92	2	55	2	45	.041	1.942
Distance to road in minutes	430	13.598	33.949	0	220	0	180	3.929	18.893
sqrt(Distance)	430	2.089	3.042	0	14.832	0	13.416	1.971	7.179
Area in hectares	430	8.401	5.525	.1	40	.5	30	2.374	10.82
log(Area)	430	1.943	.668	-2.303	3.689	-.693	3.401	-1.72	12.879
Number of surveyed households	430	43.535	11.69	40	120	40	80	3.178	12.248