

Biomass Mapping for Power Generation for Goa

Biomass Manual



Combustion, Gasification & Propulsion Laboratory (CGPL)
Department of Aerospace Engineering
Indian Institute of Science
Bangalore 560 012

Biomass Assessment for Goa Kharif, Yearly and Agro



Biomass Assessment for Goa

1. Kharif

- a. State-level Residue-wise----- 01
- b. State-level District-wise----- 02
- c. State-level Taluk-wise----- 02
- d. District-level Residue-wise----- 03
- e. District-level-Taluk-wise----- 03
- f. Taluk-level Residue-wise----- 04

2. Yearly

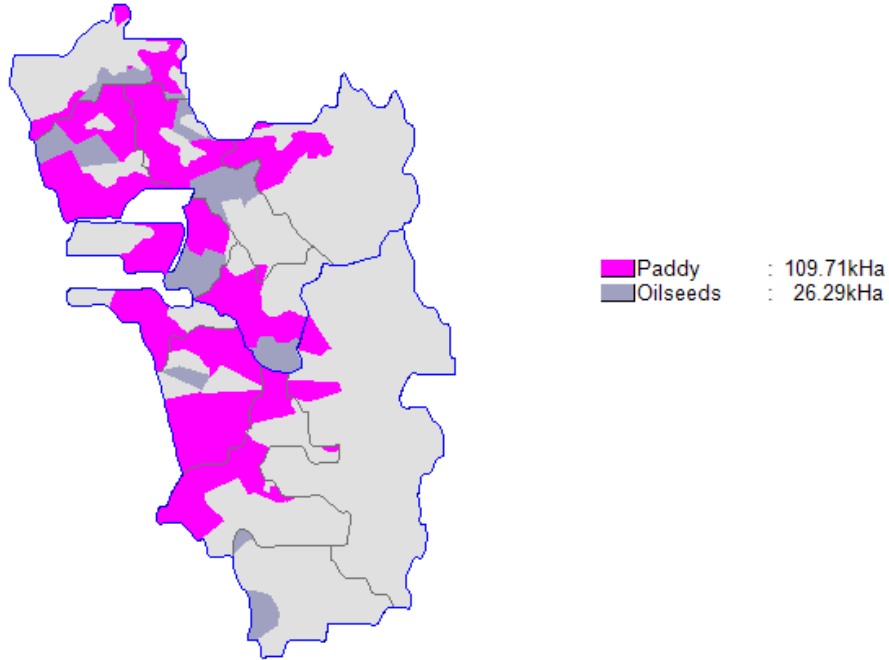
- a. State-level Residue-wise----- 07
- b. State-level District-wise----- 08
- c. State-level Taluk-wise----- 08
- d. District-level Residue-wise----- 09
- e. District-level-Taluk-wise----- 10
- f. Taluk-level Residue-wise----- 10

3. Agro

- a. State-level Residue-wise----- 14
- b. State-level District-wise----- 14
- c. State-level Taluk-wise----- 15
- d. District-level Residue-wise----- 15
- e. District-level-Taluk-wise----- 16
- f. Taluk-level Residue-wise----- 17

Kharif

Goa-Kharif



State Level Residue Wise

State level Residue-wise Data for Goa; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	109.7	405.9	81.2	48.7	5.4
Paddy	Straw	109.7	405.9	608.9	30.4	3.7
Oilseeds	Stalks	26.3	36.8	73.6	14.7	1.8
Total		136.0	442.8	763.7	93.9	10.8

State Level District Wise

State level District-wise Data for Goa ; Season : Kharif					
District	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
North Goa	84.6	264.2	458.0	57.6	6.6
South Goa	51.4	178.6	305.7	36.3	4.1
Total	136.0	442.8	763.7	93.9	10.8

State-level Taluk-wise

State level Taluk-wise Data for Goa ; Season : Kharif						
District	Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
North Goa	Bardez	22.2	72.5	124.9	15.3	1.8
South Goa	Salcete	20.9	73.9	126.2	14.9	1.7
North Goa	Bicholim	19.1	54.9	96.2	12.7	1.5
South Goa	Quepen	16.1	59.5	101.2	11.6	1.3
North Goa	Tiswadi	14.1	42.1	73.5	9.5	1.1
North Goa	Ponda	12.7	40.1	69.4	8.7	1.00
North Goa	Satari	8.0	29.8	50.6	5.8	0.66
North Goa	Pernem	8.4	24.9	43.4	5.6	0.65
South Goa	Marmugao	7.0	25.7	43.8	5.0	0.57
South Goa	Sanguem	3.9	14.5	24.7	2.8	0.32
South Goa	Canacona	3.5	4.9	9.8	2.0	0.24
Total		136.0	442.8	763.7	93.9	10.8

District-level Residue-wise

District level Residue-wise Data for North Goa; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	63.4	234.4	46.9	28.1	3.1
Paddy	Straw	63.4	234.4	351.7	17.6	2.1
Oilseeds	Stalks	21.2	29.7	59.5	11.9	1.4
Total		84.6	264.2	458.0	57.6	6.6

District level Residue-wise Data for South Goa; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	46.3	171.5	34.3	20.6	2.3
Paddy	Straw	46.3	171.5	257.2	12.9	1.5
Oilseeds	Stalks	5.1	7.1	14.2	2.8	0.34
Total		51.4	178.6	305.7	36.3	4.1

District-level Taluk-wise

DistrictLevel Taluk-wise Data for North Goa ; Season : Kharif					
Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Bardez	22.2	72.5	124.9	15.3	1.8
Bicholim	19.1	54.9	96.2	12.7	1.5
Tiswadi	14.1	42.1	73.5	9.5	1.1
Ponda	12.7	40.1	69.4	8.7	1.00
Satari	8.0	29.8	50.6	5.8	0.66
Pernem	8.4	24.9	43.4	5.6	0.65
Total	84.6	264.2	458.0	57.6	6.6

DistrictLevel Taluk-wise Data for South Goa ; Season : Kharif					
Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Salcete	20.9	73.9	126.2	14.9	1.7
Quepen	16.1	59.5	101.2	11.6	1.3
Marmugao	7.0	25.7	43.8	5.0	0.57
Sanguem	3.9	14.5	24.7	2.8	0.32
Canacona	3.5	4.9	9.8	2.0	0.24
Total	51.4	178.6	305.7	36.3	4.1

Taluk Level Residue wise

Taluk level Residue-wise Data for Bardez ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	18.0	66.6	13.3	8.0	0.88
Paddy	Straw	18.0	66.6	99.8	5.0	0.60
Oilseeds	Stalks	4.2	5.9	11.8	2.4	0.28
Total		22.2	72.5	124.9	15.3	1.8

Taluk level Residue-wise Data for Bicholim ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	12.2	45.2	9.0	5.4	0.60
Oilseeds	Stalks	6.9	9.7	19.4	3.9	0.46
Paddy	Straw	12.2	45.2	67.8	3.4	0.41
Total		19.1	54.9	96.2	12.7	1.5

Taluk level Residue-wise Data for Pernem ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	5.7	21.0	4.2	2.5	0.28
Paddy	Straw	5.7	21.0	31.6	1.6	0.19
Oilseeds	Stalks	2.7	3.8	7.6	1.5	0.18
Total		8.4	24.9	43.4	5.6	0.65

Taluk level Residue-wise Data for Ponda ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	9.7	35.9	7.2	4.3	0.47
Paddy	Straw	9.7	35.9	53.9	2.7	0.32
Oilseeds	Stalks	3.0	4.2	8.3	1.7	0.20
Total		12.7	40.1	69.4	8.7	1.00

Taluk level Residue-wise Data for Satari ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	8.0	29.8	6.0	3.6	0.39
Paddy	Straw	8.0	29.8	44.7	2.2	0.27
Total		8.0	29.8	50.6	5.8	0.66

Taluk level Residue-wise Data for Tiswadi ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	9.7	35.9	7.2	4.3	0.47
Paddy	Straw	9.7	35.9	53.9	2.7	0.32
Oilseeds	Stalks	4.4	6.2	12.4	2.5	0.30
Total		14.1	42.1	73.5	9.5	1.1

Taluk level Residue-wise Data for Canacona ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Oilseeds	Stalks	3.5	4.9	9.8	2.0	0.24
Total		3.5	4.9	9.8	2.0	0.24

Taluk level Residue-wise Data for Marmugao ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	7.0	25.7	5.1	3.1	0.34
Paddy	Straw	7.0	25.7	38.6	1.9	0.23
Total		7.0	25.7	43.8	5.0	0.57

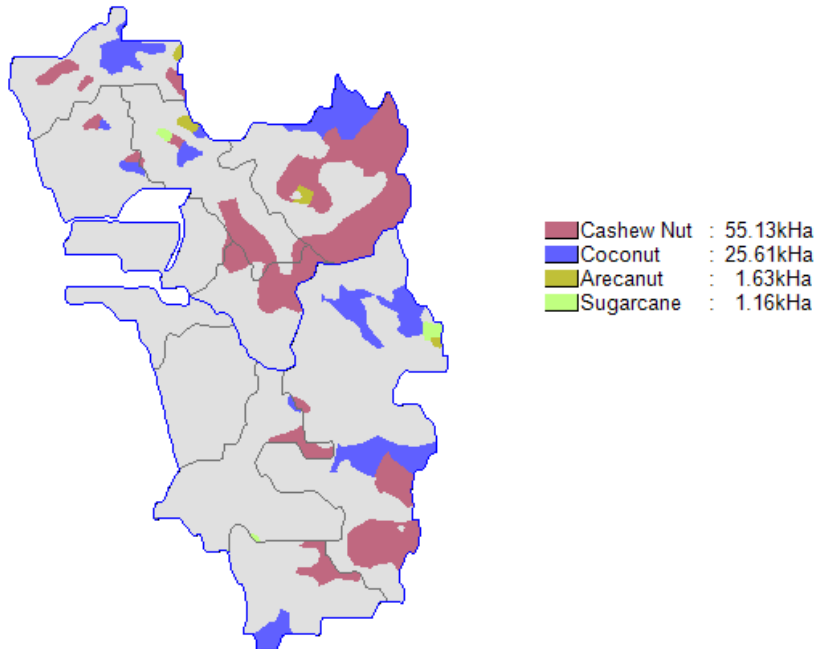
Taluk level Residue-wise Data for Quepen ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	16.1	59.5	11.9	7.1	0.79
Paddy	Straw	16.1	59.5	89.3	4.5	0.54
Total		16.1	59.5	101.2	11.6	1.3

Taluk level Residue-wise Data for Salcete ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	19.4	71.7	14.3	8.6	0.95
Paddy	Straw	19.4	71.7	107.6	5.4	0.65
Oilseeds	Stalks	1.6	2.2	4.3	0.87	0.10
Total		20.9	73.9	126.2	14.9	1.7

Taluk level Residue-wise Data for Sanguem ; Season : Kharif						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	3.9	14.5	2.9	1.7	0.19
Paddy	Straw	3.9	14.5	21.8	1.1	0.13
Total		3.9	14.5	24.7	2.8	0.32

Yearly

Goa-Yearly



State-level Residue-wise

State level Residue-wise Data for Goa; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	25.6	120.4	102.5	51.2	7.2
Coconut	Husk & Pith	25.6	120.4	63.8	31.9	4.1
Coconut	Shell	25.6	120.4	26.5	13.2	1.9
Cashewnut	Stalks	55.1	27.6	49.6	9.9	1.3
Cashewnut	Shell	55.1	27.6	13.8	2.8	0.36
Arecanut	FronDs	1.6	2.1	4.9	1.7	0.24
Sugarcane	Tops & Leaves	1.2	107.0	5.3	1.1	0.15
Arecanut	Husk	1.6	2.1	1.7	0.60	0.083
Total		83.5	257.0	268.1	112.4	15.3

State-level District-wise

State level District-wise Data for Goa ; Season : Yearly					
District	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
South Goa	30.4	154.7	130.2	58.6	8.0
North Goa	53.2	102.3	137.9	53.8	7.3
Total	83.5	257.0	268.1	112.4	15.3

State-level Taluk-wise

State level Taluk-wise Data for Goa ; Season : Yearly						
District	Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
South Goa	Sanguem	23.3	132.2	105.4	47.9	6.5
North Goa	Satari	30.3	39.5	72.9	27.8	3.8
North Goa	Pernem	6.4	18.7	31.3	14.6	2.0
South Goa	Canacona	4.9	11.9	20.0	9.1	1.2
North Goa	Bicholim	7.5	36.6	18.8	6.8	0.92
North Goa	Bardez	1.5	3.8	6.3	2.9	0.39
South Goa	Quepen	2.3	10.6	4.8	1.6	0.22
North Goa	Ponda	7.1	3.5	8.1	1.6	0.21
North Goa	Tiswadi	0.39	0.19	0.44	0.089	0.012
Total		83.5	257.0	268.1	112.4	15.3

District-level Residue-wise

District level Residue-wise Data for North Goa; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	11.2	52.8	44.9	22.5	3.1
Coconut	Husk & Pith	11.2	52.8	28.0	14.0	1.8
Cashewnut	Stalks	40.2	20.1	36.2	7.2	0.94
Coconut	Shell	11.2	52.8	11.6	5.8	0.81
Cashewnut	Shell	40.2	20.1	10.0	2.0	0.26
Arecanut	FronDs	1.4	1.9	4.3	1.5	0.21
Arecanut	Husk	1.4	1.9	1.5	0.52	0.073
Others	Others	0.30	27.5	1.4	0.28	0.039
Total		53.2	102.3	137.9	53.8	7.3

District level Residue-wise Data for South Goa; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	14.4	67.6	57.5	28.8	4.0
Coconut	Husk & Pith	14.4	67.6	35.8	17.9	2.3
Coconut	Shell	14.4	67.6	14.9	7.4	1.0
Cashewnut	Stalks	14.9	7.5	13.4	2.7	0.35
Sugarcane	Tops & Leaves	0.87	79.4	4.0	0.79	0.11
Cashewnut	Shell	14.9	7.5	3.7	0.75	0.097
Others	Others	0.20	0.26	0.81	0.28	0.040
Total		30.4	154.7	130.2	58.6	8.0

District-level Taluk-wise

DistrictLevel Taluk-wise Data for North Goa ; Season : Yearly					
Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Satari	30.3	39.5	72.9	27.8	3.8
Pernem	6.4	18.7	31.3	14.6	2.0
Bicholim	7.5	36.6	18.8	6.8	0.92
Bardez	1.5	3.8	6.3	2.9	0.39
Ponda	7.1	3.5	8.1	1.6	0.21
Tiswadi	0.39	0.19	0.44	0.089	0.012
Total	53.2	102.3	137.9	53.8	7.3

DistrictLevel Taluk-wise Data for South Goa ; Season : Yearly					
Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Sanguem	23.3	132.2	105.4	47.9	6.5
Canacona	4.9	11.9	20.0	9.1	1.2
Quepen	2.3	10.6	4.8	1.6	0.22
Total	30.4	154.7	130.2	58.6	8.0

Taluk-level Residue-wise

Taluk level Residue-wise Data for Bardez ; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	0.72	3.4	2.9	1.4	0.20
Coconut	Husk & Pith	0.72	3.4	1.8	0.90	0.12
Coconut	Shell	0.72	3.4	0.75	0.37	0.052
Others	Others	0.75	0.38	0.86	0.17	0.022
Total		1.5	3.8	6.3	2.9	0.39

Taluk level Residue-wise Data for Bicholim ; Season : Yearly

Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	1.2	5.7	4.8	2.4	0.34
Coconut	Husk & Pith	1.2	5.7	3.0	1.5	0.19
Cashewnut	Stalks	5.5	2.8	5.0	0.99	0.13
Others	Others	0.30	27.5	3.3	0.73	0.10
Coconut	Shell	1.2	5.7	1.2	0.62	0.087
Arecanut	FronDs	0.50	0.65	1.5	0.53	0.074
Total		7.5	36.6	18.8	6.8	0.92

Taluk level Residue-wise Data for Pernem ; Season : Yearly

Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	3.7	17.2	14.6	7.3	1.0
Coconut	Husk & Pith	3.7	17.2	9.1	4.5	0.59
Coconut	Shell	3.7	17.2	3.8	1.9	0.26
Others	Others	0.23	0.30	1.6	0.45	0.062
Cashewnut	Stalks	2.6	1.3	2.3	0.46	0.060
Total		6.4	18.7	31.3	14.6	2.0

Taluk level Residue-wise Data for Ponda ; Season : Yearly

Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Cashewnut	Stalks	7.1	3.5	6.3	1.3	0.17
Others	Others	0	0	1.8	0.35	0.046
Total		7.1	3.5	8.1	1.6	0.21

Taluk level Residue-wise Data for Satari ; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	5.7	26.6	22.6	11.3	1.6
Coconut	Husk & Pith	5.7	26.6	14.1	7.0	0.92
Cashewnut	Stalks	23.9	12.0	21.5	4.3	0.56
Coconut	Shell	5.7	26.6	5.8	2.9	0.41
Cashewnut	Shell	23.9	12.0	6.0	1.2	0.16
Arecanut	FronDs	0.70	0.92	2.1	0.74	0.10
Others	Others	0	0	0.73	0.26	0.036
Total		30.3	39.5	72.9	27.8	3.8

Taluk level Residue-wise Data for Tiswadi ; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Others	Others	0.39	0.19	0.44	0.089	0.012
Total		0.39	0.19	0.44	0.089	0.012

Taluk level Residue-wise Data for Canacona ; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	2.3	10.6	9.0	4.5	0.63
Coconut	Husk & Pith	2.3	10.6	5.6	2.8	0.37
Coconut	Shell	2.3	10.6	2.3	1.2	0.16
Cashewnut	Stalks	2.6	1.3	2.3	0.47	0.061
Others	Others	0	0	0.65	0.13	0.017
Total		4.9	11.9	20.0	9.1	1.2

Taluk level Residue-wise Data for Quepen ; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Others	Others	2.0	9.2	3.6	1.0	0.14
Coconut	FronDs	0.29	1.4	1.2	0.58	0.081
Total		2.3	10.6	4.8	1.6	0.22

Taluk level Residue-wise Data for Sanguem ; Season : Yearly						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	Fronds	11.8	55.6	47.3	23.7	3.3
Coconut	Husk & Pith	11.8	55.6	29.5	14.7	1.9
Coconut	Shell	11.8	55.6	12.2	6.1	0.86
Cashewnut	Stalks	10.5	5.2	9.4	1.9	0.24
Sugarcane	Tops & Leaves	0.78	71.1	3.6	0.71	0.100
Cashewnut	Shell	10.5	5.2	2.6	0.52	0.068
Others	Others	0.20	0.26	0.81	0.28	0.040
Total		23.3	132.2	105.4	47.9	6.5

Agro

State-level Residue-wise

State level Residue-wise Data for Goa; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	Fronds	25.6	120.4	102.5	51.2	7.2
Paddy	Husk	109.7	405.9	81.2	48.7	5.4
Coconut	Husk & Pith	25.6	120.4	63.8	31.9	4.1
Paddy	Straw	109.7	405.9	608.9	30.4	3.7
Coconut	Shell	25.6	120.4	26.5	13.2	1.9
Oilseeds	Stalks	26.3	36.8	73.6	14.7	1.8
Cashewnut	Stalks	55.1	27.6	49.6	9.9	1.3
Cashewnut	Shell	55.1	27.6	13.8	2.8	0.36
Arecanut	Fronds	1.6	2.1	4.9	1.7	0.24
Sugarcane	Tops & Leaves	1.2	107.0	5.3	1.1	0.15
Arecanut	Husk	1.6	2.1	1.7	0.60	0.083
Total		219.6	699.8	1031.8	206.3	26.1

State-level District-wise

State level District-wise Data for Goa ; Biomass Class : Agro					
District	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
North Goa	137.8	366.5	595.9	111.4	13.9
South Goa	81.8	333.3	435.9	94.9	12.1
Total	219.6	699.8	1031.8	206.3	26.1

State-level Taluk-wise

State level Taluk-wise Data for Goa ; Biomass Class : Agro						
District	Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
South Goa	Sanguem	27.2	146.7	130.1	50.8	6.9
North Goa	Satari	38.3	69.2	123.5	33.6	4.4
North Goa	Pernem	14.9	43.6	74.7	20.3	2.6
North Goa	Bicholim	26.6	91.5	115.0	19.5	2.4
North Goa	Bardez	23.7	76.2	131.2	18.2	2.2
South Goa	Salcete	20.9	73.9	126.2	14.9	1.7
South Goa	Quepen	18.3	70.1	105.9	13.2	1.5
South Goa	Canacona	8.4	16.8	29.8	11.1	1.5
North Goa	Ponda	19.7	43.6	77.5	10.3	1.2
North Goa	Tiswadi	14.5	42.3	73.9	9.6	1.1
South Goa	Marmugao	7.0	25.7	43.8	5.0	0.57
Total		219.6	699.8	1031.8	206.3	26.1

District-level Residue-wise

District level Residue-wise Data for North Goa; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	11.2	52.8	44.9	22.5	3.1
Paddy	Husk	63.4	234.4	46.9	28.1	3.1
Paddy	Straw	63.4	234.4	351.7	17.6	2.1
Coconut	Husk & Pith	11.2	52.8	28.0	14.0	1.8
Oilseeds	Stalks	21.2	29.7	59.5	11.9	1.4
Cashewnut	Stalks	40.2	20.1	36.2	7.2	0.94
Coconut	Shell	11.2	52.8	11.6	5.8	0.81
Cashewnut	Shell	40.2	20.1	10.0	2.0	0.26
Arecanut	FronDs	1.4	1.9	4.3	1.5	0.21
Arecanut	Husk	1.4	1.9	1.5	0.52	0.073
Others	Others	0.30	27.5	1.4	0.28	0.039
Total		137.8	366.5	595.9	111.4	13.9

District level Residue-wise Data for South Goa; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	14.4	67.6	57.5	28.8	4.0
Coconut	Husk & Pith	14.4	67.6	35.8	17.9	2.3
Paddy	Husk	46.3	171.5	34.3	20.6	2.3
Paddy	Straw	46.3	171.5	257.2	12.9	1.5
Coconut	Shell	14.4	67.6	14.9	7.4	1.0
Cashewnut	Stalks	14.9	7.5	13.4	2.7	0.35
Oilseeds	Stalks	5.1	7.1	14.2	2.8	0.34
Sugarcane	Tops & Leaves	0.87	79.4	4.0	0.79	0.11
Cashewnut	Shell	14.9	7.5	3.7	0.75	0.097
Others	Others	0.20	0.26	0.81	0.28	0.040
Total		81.8	333.3	435.9	94.9	12.1

District-level Taluk-wise

DistrictLevel Taluk-wise Data for North Goa ; Biomass Class : Agro					
Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Satari	38.3	69.2	123.5	33.6	4.4
Pernem	14.9	43.6	74.7	20.3	2.6
Bicholim	26.6	91.5	115.0	19.5	2.4
Bardez	23.7	76.2	131.2	18.2	2.2
Ponda	19.7	43.6	77.5	10.3	1.2
Tiswadi	14.5	42.3	73.9	9.6	1.1
Total	137.8	366.5	595.9	111.4	13.9

DistrictLevel Taluk-wise Data for South Goa ; Biomass Class : Agro					
Taluk	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Sanguem	27.2	146.7	130.1	50.8	6.9
Salcete	20.9	73.9	126.2	14.9	1.7
Quepen	18.3	70.1	105.9	13.2	1.5
Canacona	8.4	16.8	29.8	11.1	1.5
Marmugao	7.0	25.7	43.8	5.0	0.57
Total	81.8	333.3	435.9	94.9	12.1

Taluk-level Residue-wise

Taluk level Residue-wise Data for Bardez ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	18.0	66.6	13.3	8.0	0.88
Paddy	Straw	18.0	66.6	99.8	5.0	0.60
Oilseeds	Stalks	4.2	5.9	11.8	2.4	0.28
Coconut	FronDs	0.72	3.4	2.9	1.4	0.20
Coconut	Husk & Pith	0.72	3.4	1.8	0.90	0.12
Coconut	Shell	0.72	3.4	0.75	0.37	0.052
Others	Others	0.75	0.38	0.86	0.17	0.022
Total		23.7	76.2	131.2	18.2	2.2

Taluk level Residue-wise Data for Bicholim ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	12.2	45.2	9.0	5.4	0.60
Oilseeds	Stalks	6.9	9.7	19.4	3.9	0.46
Paddy	Straw	12.2	45.2	67.8	3.4	0.41
Coconut	FronDs	1.2	5.7	4.8	2.4	0.34
Coconut	Husk & Pith	1.2	5.7	3.0	1.5	0.19
Cashewnut	Stalks	5.5	2.8	5.0	0.99	0.13

Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Others	Others	0.30	27.5	3.3	0.73	0.10
Coconut	Shell	1.2	5.7	1.2	0.62	0.087
Arecanut	FronDs	0.50	0.65	1.5	0.53	0.074
Total		26.6	91.5	115.0	19.5	2.4

Taluk level Residue-wise Data for Pernem ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	3.7	17.2	14.6	7.3	1.0
Coconut	Husk & Pith	3.7	17.2	9.1	4.5	0.59
Paddy	Husk	5.7	21.0	4.2	2.5	0.28
Coconut	Shell	3.7	17.2	3.8	1.9	0.26
Paddy	Straw	5.7	21.0	31.6	1.6	0.19
Oilseeds	Stalks	2.7	3.8	7.6	1.5	0.18
Others	Others	0.23	0.30	1.6	0.45	0.062
Cashewnut	Stalks	2.6	1.3	2.3	0.46	0.060
Total		14.9	43.6	74.7	20.3	2.6

Taluk level Residue-wise Data for Ponda ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	9.7	35.9	7.2	4.3	0.47
Paddy	Straw	9.7	35.9	53.9	2.7	0.32
Oilseeds	Stalks	3.0	4.2	8.3	1.7	0.20
Cashewnut	Stalks	7.1	3.5	6.3	1.3	0.17
Others	Others	0	0	1.8	0.35	0.046
Total		19.7	43.6	77.5	10.3	1.2

Taluk level Residue-wise Data for Satari ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	5.7	26.6	22.6	11.3	1.6
Coconut	Husk & Pith	5.7	26.6	14.1	7.0	0.92
Cashewnut	Stalks	23.9	12.0	21.5	4.3	0.56
Coconut	Shell	5.7	26.6	5.8	2.9	0.41

Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	8.0	29.8	6.0	3.6	0.39
Paddy	Straw	8.0	29.8	44.7	2.2	0.27
Cashewnut	Shell	23.9	12.0	6.0	1.2	0.16
Arecanut	FronDs	0.70	0.92	2.1	0.74	0.10
Others	Others	0	0	0.73	0.26	0.036
Total		38.3	69.2	123.5	33.6	4.4

Taluk level Residue-wise Data for Tiswadi ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	9.7	35.9	7.2	4.3	0.47
Paddy	Straw	9.7	35.9	53.9	2.7	0.32
Oilseeds	Stalks	4.4	6.2	12.4	2.5	0.30
Others	Others	0.39	0.19	0.44	0.089	0.012
Total		14.5	42.3	73.9	9.6	1.1

Taluk level Residue-wise Data for Canacona ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	FronDs	2.3	10.6	9.0	4.5	0.63
Coconut	Husk & Pith	2.3	10.6	5.6	2.8	0.37
Oilseeds	Stalks	3.5	4.9	9.8	2.0	0.24
Coconut	Shell	2.3	10.6	2.3	1.2	0.16
Cashewnut	Stalks	2.6	1.3	2.3	0.47	0.061
Others	Others	0	0	0.65	0.13	0.017
Total		8.4	16.8	29.8	11.1	1.5

Taluk level Residue-wise Data for Marmugao ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	7.0	25.7	5.1	3.1	0.34
Paddy	Straw	7.0	25.7	38.6	1.9	0.23
Total		7.0	25.7	43.8	5.0	0.57

Taluk level Residue-wise Data for Quepen ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	16.1	59.5	11.9	7.1	0.79
Paddy	Straw	16.1	59.5	89.3	4.5	0.54
Others	Others	2.0	9.2	3.6	1.0	0.14
Coconut	Fronds	0.29	1.4	1.2	0.58	0.081
Total		18.3	70.1	105.9	13.2	1.5

Taluk level Residue-wise Data for Salcete ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Paddy	Husk	19.4	71.7	14.3	8.6	0.95
Paddy	Straw	19.4	71.7	107.6	5.4	0.65
Oilseeds	Stalks	1.6	2.2	4.3	0.87	0.10
Total		20.9	73.9	126.2	14.9	1.7

Taluk level Residue-wise Data for Sanguem ; Biomass Class : Agro						
Crop	Residue	Area (kHa)	Crop Production (kT/Yr)	Biomass Generation (kT/Yr)	Biomass Surplus (kT/Yr)	Power Potential (MWe)
Coconut	Fronds	11.8	55.6	47.3	23.7	3.3
Coconut	Husk & Pith	11.8	55.6	29.5	14.7	1.9
Coconut	Shell	11.8	55.6	12.2	6.1	0.86
Cashewnut	Stalks	10.5	5.2	9.4	1.9	0.24
Paddy	Husk	3.9	14.5	2.9	1.7	0.19
Paddy	Straw	3.9	14.5	21.8	1.1	0.13
Sugarcane	Tops & Leaves	0.78	71.1	3.6	0.71	0.100
Cashewnut	Shell	10.5	5.2	2.6	0.52	0.068
Others	Others	0.20	0.26	0.81	0.28	0.040
Total		27.2	146.7	130.1	50.8	6.9

Note:

Biomass Data for season 'Rabi' for 'Goa' is not available at CGPL

Others' contributes to collection of crops whose Power Potential is less than 0.05MWyre. These residues will not be separately listed instead they are aggregated into 'Others'.

The Tolerance for the above data at Taluk level is about 25%. The residue-wise data at taluk level may have a tolerance of more than 25% depending on spatial availability of agro-area and spatial aggregation as compared to statistically reported crop area. District Survey instituted by MNRE [Ministry of New & Renewable Energy] was done and biomass was reported for period beyond 1999 of the States countrywide. The updated crop data at the district level is used as an input to construct the Biomass Atlas

Enabling spatial extraction of the biomass data tables above.