LIST OF FIGURES

Sr. No.	Figure Name	Page No.
1.	Bottom-up physical RT inversion mapping a quantitative characteristic of vegetation canopy from remotely sensed imaging spectroscopy data	16
2.	The PROSAIL model: Input parameters and steps involved	17
3.	Interaction of radar signal with an agricultural target: 1) backscatter directly	20
	from the crop (including multiple scattering) 2) backscatter from the	
	combination of crop and soil 3) backscatter directly from the soil (including	
	multiple scattering)	
4.	Map showing site of study area	29
5.	Land Utilization Statistics	30
6.	Soil map of Gujarat State	31
7.	Year wise average rainfall (in mm) of the district	32
8.	Irrigated/Non-irrigated Area	33
9.	Source wise Area Irrigated	33
10.	Area under Kharif Crops	34
11.	Area under Rabi Crops	34
12.	Livestock Population of the district	35
13.	Flow chart showing an entire methodology	37
14.	Statewise Area under Cotton (in '000 hectares) in India 20011-12	54
15.	Trends in area under cotton in country from 2000-2012	54
16.	Area under cotton in Gujarat between 2000 and 2012	55
17.	Production of cotton in Gujarat between 2000 and 2012	55
18.	Trends in area under cotton in Vadodara district from 2000 to 2012	56
19.	Production of cotton in Vadodara district from 2000 to 2012	56
20.	Trends in cotton yield in Vadodara district from 2000 to 2012	57
21.	Statewise Area under Castor (in '000 hectares) in India 20011-12	58
22.	Trends in area under castor in country from 2002-2012	58
23.	Area under castor in Gujarat between 2000 and 2012	59
24.	Production of castor in Gujarat between 2000 and 2012	59
25.	Trends in area under castor in Vadodara district from 2000 to 2012	60
26.	Production of castor in Vadodara district from 2000 to 2012	60
27.	Trends in castor yield in Vadodara district from 2000 to 2012	60
28.	Statewise Area under Banana (in '000 hectares) in India 20011-12	61
29.	Trends in area under banana in country from 2002-2012	61
30.	Area under banana in Gujarat between 2000 and 2012	62
31.	Production of banana in Gujarat between 2000 and 2012	62
32.	Trends in area under banana in Vadodara district from 2000 to 2012	63
33.	Production of banana in Vadodara district from 2000 to 2012	63
34.	Trends in yields of banana in Vadodara district from 2000 to 2012	64
35.	Crop Calendar of (a) cotton (b) castor (c) banana crops	65
36.	Mean and standard deviation of HH σ° for various classes	76

37.	Mean and standard deviation of VV σ° for various classes	76
38.	The linear relationship between Landsat 5 TM derived NDVI and cotton	96
	LAI	
39.	Validation of Landsat NDVI-LAI model using ground measured cotton	96
	LAI	
40.	The linear relationship between Landsat 5 TM derived RVI and cotton LAI	96
41.	Validation of Landsat RVI-LAI model using ground measured cotton LAI	96
42.	The linear relationship between LISS IV derived NDVI and cotton LAI	96
43.	Validation of LISS IV NDVI-LAI model using ground measured cotton	96
	LAI	
44.	The linear relationship between LISS IV derived RVI and cotton LAI	96
45.	Validation of LISS IV RVI–LAI model using ground measured cotton LAI	96
46.	The linear relationship between Landsat 5 TM derived NDVI and castor	99
	LAI	
47.	Validation of Landsat NDVI–LAI model using ground measured castor LAI	99
48.	The linear relationship between Landsat 5 TM derived RVI and castor LAI	99
49.	Validation of Landsat RVI–LAI model using ground measured castor LAI	99
50.	The linear relationship between LISS IV derived NDVI and castor LAI	99
51.	Validation of LISS IV NDVI-LAI model using ground measured castor	99
	LAI	
52.	The linear relationship between LISS IV derived RVI and castor LAI	99
53.	Validation of LISS IV RVI–LAI model using ground measured castor LAI	99
54.	The linear relationship between Landsat 5 TM derived NDVI and banana	102
	LAI	
55.	Validation of Landsat NDVI-LAI model using ground measured banana	102
	LAI	
56.	The linear relationship between Landsat 5 TM derived RVI and banana LAI	102
57.	Validation of Landsat RVI–LAI model using ground measured banana LAI	102
58.	The linear relationship between LISS IV derived NDVI and banana LAI	102
59.	Validation of LISS IV NDVI-LAI model using ground measured banana	102
	LAI	
60.	The linear relationship between LISS IV derived RVI and banana LAI	102
61.	Validation of LISS IV RVI-LAI model using ground measured banana LAI	102
62.	The linear relationship between Landsat 5 TM derived NDWI and cotton	105
	RWC	
63.	Validation of NDWI-RWC model using estimated cotton RWC	105
64.	The linear relationship between Landsat 5 TM derived NDWI and castor	106
	RWC	
65.	Validation of NDWI-RWC model using estimated castor RWC	106
66.	The linear relationship between Landsat 5 TM derived NDWI and banana	106
	RWC	
67.	Validation of NDWI–RWC model using estimated banana RWC	106
68.	The linear relationship between Landsat 5 TM derived NDVI and cotton	110
	CC	
69.	Validation of Landsat NDVI–CC model using ground measured cotton CC	110

 70.	The linear relationship between Landsat 5 TM derived RVI and cotton CC	110
 71.	Validation of Landsat RVI–CC model using ground measured cotton CC	110
 72.	The linear relationship between LISS IV TM derived NDVI and cotton CC	110
 73.	Validation of LISS IV NDVI-CC model using ground measured cotton CC	110
 74.	The linear relationship between LISS IV derived RVI and cotton CC	110
 75.	Validation of LISS IV RVI–CC model using ground measured cotton CC	110
 76.	The linear relationship between Landsat 5 TM derived NDVI and castor CC	113
77.	Validation of Landsat NDVI-CC model using ground measured castor CC	113
 78.	The linear relationship between Landsat 5 TM derived RVI and castor CC	113
 79.	Validation of Landsat RVI–CC model using ground measured castor CC	113
 80.	The linear relationship between LISS IV TM derived NDVI and castor CC	113
 81.	Validation of LISS IV NDVI–CC model using ground measured castor CC	113
82.	The linear relationship between LISS IV derived RVI and castor CC	113
 83.	Validation of LISS IV RVI–CC model using ground measured castor CC	113
84.	The linear relationship between Landsat 5 TM derived NDVI and banana	116
	CC	
 85.	Validation of Landsat NDVI–CC model using ground measured banana CC	116
 86.	The linear relationship between Landsat 5 TM derived RVI and banana CC	116
 87.	Validation of Landsat RVI–CC model using ground measured banana CC	116
 88.	The linear relationship between LISS IV TM derived NDVI and banana CC	116
 89.	Validation of LISS IV NDVI–CC model using ground measured banana CC	116
 90.	The linear relationship between LISS IV derived RVI and banana CC	116
 91.	Validation of LISS IV RVI–CC model using ground measured banana CC	116
92.	The linear relationship between Landsat 5 TM derived NDVI and cotton	120
	biomass	
93.	The linear relationship between Landsat5 TM derived RVI and cotton	120
	biomass	
 94.	The linear relationship between LISS IV derived NDVI and cotton biomass	120
 95.	The linear relationship between LISS IV derived RVI and cotton biomass	120
96.	The linear relationship between Landsat 5 TM derived NDVI and banana	123
 	biomass	
97.	The linear relationship between Landsat5 TM derived RVI and banana	123
 00	biomass HGC NV I in INDVI	100
 98.	The linear relationship between LISS IV derived NDVI and banana biomass	123
 99.	The linear relationship between LISS IV derived RVI and banana biomass	123
 100.	1	132
 101.	1	132
 102.		134
	Cotton LAI versus ENVISAT ASAR VV backscatter	134
	Banana LAI versus ENVISAT ASAR HH backscatter	134
	Banana LAI versus ENVISAT ASAR VV backscatter	134
	Cotton LAI versus VV/HH backscatter ratio	135
107.	Banana LAI versus VV/HH backscatter ratio	135