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Estimating rice yield under different wheat residue coverage levels using multispectral Gaofen satellite data and remote sensing indices

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Key words: Crop residue management; NDVI; precision agriculture; rice mapping; yield prediction.

Table S1. Measured wheat residue cover (WRC) percentage over the study area. Source: Memon *et al.,* 2023).

Sample#	WRC (%)	Measured Rice yield (kg/ha)	Sample#	WRC (%)	Measured Rice yield (kg/ha)
CS-01	40	7,187	CS-41	40	7,220
CS-02	70	8,000	CS-42	40	7,200
CS-03	35	6,800	CS-43	63	8,070
CS-04	68	8,010	CS-44	20	6,500
CS-05	62	8,300	CS-45	82	7,820
CS-06	55	7,750	CS-46	75	7,600
CS-07	70	8,000	CS-47	70	7,800
CS-08	72	7,973	CS-48	60	8,210
CS-09	70	7,750	CS-49	65	8,230
CS-10	55	7,930	CS-50	55	7,800
CS-11	55	8,100	CS-51	35	6,930
CS-12	75	7,670	CS-52	60	8,140
CS-13	50	7,450	CS-53	80	7,630
CS-14	62	7,860	CS-54	33	6,740
CS-15	85	7,200	CS-55	73	7,830
CS-16	40	7,250	CS-56	25	6,560
CS-17	82	7,700	CS-57	70	8,000
CS-18	70	8130	CS-58	70	7,800
CS-19	75	7,800	CS-59	75	7,400
CS-20	60	7,880	CS-60	65	8,000
CS-21	75	7,830	CS-61	60	8,100
CS-22	80	7,730	CS-62	38	6,730
CS-23	55	7,792	CS-63	75	7,500
CS-24	80	7,900	CS-64	60	7,800
CS-25	70	7,800	CS-65	82	7,900
CS-26	45	7,030	CS-66	60	8,050
CS-27	67	7,890	CS-67	77	7,700
CS-28	80	7,650	CS-68	48	7,200
CS-29	77	7,900	CS-69	75	7,860
CS-30	62	8,160	CS-70	40	7,000
CS-31	73	7,950	CS-71	82	7,550
CS-32	80	7,700	CS-72	90	7,500
CS-33	75	7,700	CS-73	63	8,090
CS-34	65	7,960	CS-74	45	7,200
CS-35	67	8,000	CS-75	77	7,600
CS-36	50	7,800	CS-76	60	8,250

CS-37	70	8,015	CS-77	45	7,210
CS-38	60	8,000	CS-78	45	7,130
CS-39	65	7,665	CS-79	52	8,000
CS-40	35	6,730	CS-80	50	7,600

WRC, wheat residue cover.

Table S2. Detail of spectral band wavelengths with a spatial resolution for GF-1 and GF-6 satellites.

Sr. No	**Gaofen-1 (WFV Sensor)**		
	Band	**Wavelength (μm)**	**Resolution (meters)**
1	Band 1-(Blue)	0.45-0.52	16
2	Band 2-(Green)	0.52-0.59	16
3	Band 3-(Red)	0.63-0.69	16
4	Band 4-(Near Infrared-NIR)	0.77-0.89	16
Sr. No	**Gaofen-6 (WFV Sensor)**		
	Band	**Wavelength (μm)**	**Resolution (meters)**
1	Band 1-(Blue)	0.45-0.52	16
2	Band 2-(Green)	0.52-0.59	16
3	Band 3-(Red)	0.63-0.69	16
4	Band 4-(Near Infrared-NIR)	0.77-0.89	16
5	Band 5-(Red-edge-I)	0.69-0.73	16
6	Band 6-(Red-edge-II)	0.73-0.77	16
7	Band 7-(Purple-edge)	0.40-0.45	16
8	Band 8-(Yellow-edge)	0.59-0.63	16

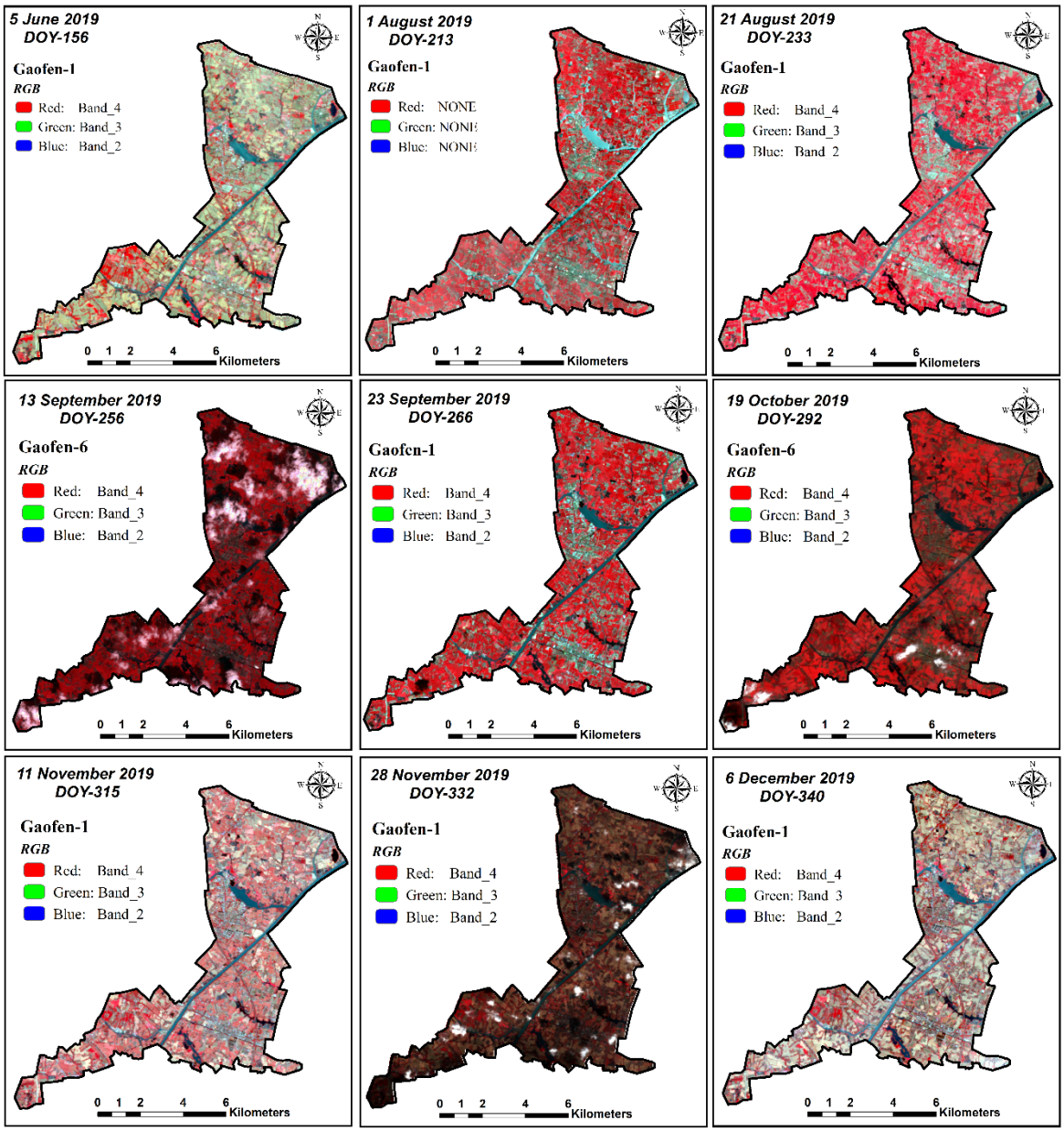

Figure S1. Images acquired from Gaofen-1 and Gaofen-6 satellites for current study during 05th June 2019 to 06th December 2019. The image frames represent the false composite color i.e., Red (B4), Green (B3) and Blue (B2).

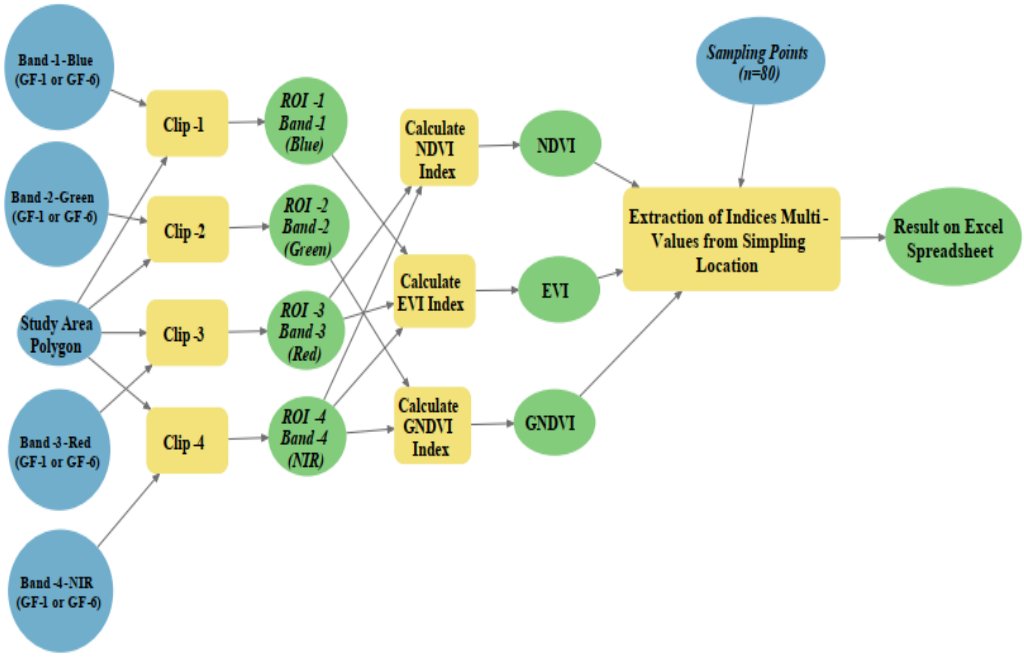

Figure S2. Methodology workflow for data extraction through the ArcGIS Pro Model Builder; ROI, region of interest.

References

Memon, M.S., Chen, S., Niu, Y., Zhou, W., Elsherbiny, O., Liang, R., et al. 2023. Evaluating the efficacy of Sentinel-2B and Landsat-8 for estimating and mapping wheat straw cover in rice-wheat fields. Agronomy 13:2691.