List of Figures

Figures	Title	page	
Figure 1.1: The map of Rajasthan India [Upadhyaya, 2014]			
Figure 2.1:	Distribution of equine population in India [Source: NRCE, 2015]	9	
Figure 2.2:	Local women of western Rajasthan region performing periodic finishing on mud structure	10	
Figure 2.3:	Open firing (baking) of pots in Rajasthan [Source: Roux, 2015]	14	
Figure 2.4:	Pit firing used in West Bengal, India [Source: Foster, 1956]	15	
Figure 2.5:	(a) Updraft kiln at Sar village. Jodhpur. Rajasthan. India (b) Experimental scaled down updraugh	nt	
ki	In at IIT Jodhpur (old campus). Raiasthan, India	15	
Figure 2.6:	Measurements and land preparation for pottery furnace construction	16	
Figure 2.7:	Steps of undraught kiln construction for baking pottery products	17	
Figure 2.8	Signals produced during SEM scanning of sample material surfaces [Source: Survanarayana 201	11 18	
Figure 2.0:	Sample EDS image of clay-sawdust mix used in cruse manufacture in western Baiasthan [EVO S	FM	
IIgure 2.9.	Flodbour]	10	
Figuro 2.10	Y Yray fluorascan sa by alastron transfor due to bigh anorgy incident radiations	20	
Figure 2.10	• A dy hubble scence by electron transfer due to high energy incluent radiations	20	
Figure 2.11	• Three point hand test banch	21	
Figure 2.12	: Madea of grants granth [Courses Forg et al. 2008]	22	
Figure 2.13	: Modes of crack growth [Source: Feng et al., 2018]	23	
Figure 2.14	A stochastic lognormal model with variables <i>Xibi</i>	27	
Figure 2.15	: Sample stacked plot XRD data using Origin software package	29	
Figure 2.16	Sample plot between Young's modulus and density by CES Edupack software	29	
Figure 3.1:	The MM-EO composite cantilever shelves at Arna Jharna desert museum [Source: Arna Jharna		
De	esert Museum, Jodhpur, Rajasthan, India]	31	
Figure 3.2:	(a) Pond soil (Meth Mitti, MM) local to Barmer region (b) Horse dung (EO)	32	
Figure 3.3:	The procedure of making the MM-EO mixure and its composite samples	34	
Figure 3.4:	(a) SEM micrograph of MM (b) EDS spectra of MM [Carl Zeiss EVO 18 SEM, IIT Jodhpur]	37	
Figure 3.5:	(a) FESEM micrograph of EO [Carl Zeiss EVO 18 SEM, IIT Jodhpur] (b) EDS spectra of EO [Carl eiss EVO 18 SEM. IIT Jodhpur]	37	
Figure 3.6:	Variation of density and thermal conductivity in the MM-FO composites	30	
Figure 2.7	The variation of the weight of MM-FO samples with age and composition (Minitab 16 software	ПΤ	
Ingui C 3.71	where valuation of the weight of him to samples with age and composition (minitable solution)	/11	
Figure 2 8.	The variation of humidity and temperature during the 28-days period of MM-EO composite curi	יד ing	
inguic 3.0.	(periments conducted at lodbur	15	
Elguro 2 or	$C_{\rm emportance}$ and $C_{\rm emportance}$ an	41	
Figure 3.9.	Comparative analysis of weight loss during curing experiments and prediction using Eq. (3.15)	43	
Figure 3.10	• Representation of three-point loading if allework for rectangular specifiens	43	
Figure 3.11	Development of flexural strength in MM-EO composites with time	44	
Figure 3.12: Flexural strength box plot of MM-EO composite for 28-day period corresponding to the Figure 3.11			
		44	
Figure 3.13	: The compressive strength of MM-EO composite as a function of initial volume fraction of wate	r	
us	sed to manufacture distinct composites	45	
Figure 3.14	: Compressive strength box plot of MM-EO composite for 28-day period corresponding to the F	igure	
3.	13	46	
Figure 3.15	: Bi-modal distribution of fracture toughness with age	47	
Figure 3.16	: Plot of fracture toughness as a function of density for MM-EO composite	47	
Figure 3.17	: Fractured surfaces of MM-EO composites (M10Eo, M7E3, M6E4, M5E5 and M4E6) observed us	ing a	
42	K optical zoom camera	48	
Figure 3.18	The first and third quartile values of surface roughness of the distinct samples of MM-EO		
<u>ر</u> ق	omposite	49	
Figure 3.19	: The roughness values of M5E5 specimen surfaces compared with surface roughness of other	.,	
sn.	becimens	49	
Figure 2.20	: The fractured M5E5 specimen and the crack surfaces with protruding cellulosic fibers	50	
Figure 3.21	: The roughness values of M5E5 specimen surfaces compared with surface roughness of other	٥ر	
sp	pecimens.	50	
Figure 4.1:	(a) Off-white pots manufactured in Rajasthan (b) Red color pots manufactured in Gujarat	53	

Figure 4.2: Variation of thickness with variation of the height of pots	54
Figure 4.3: (a) SEM image of the clay of Sar village, Jodhpur, Rajasthan [Carl Zeiss EVO 18 SEM, IIT Jodhpur]	(b)
EDS plot for the clay of Sar village, Jodhpur, Rajasthan [Carl Zeiss EVO 18 SEM, IIT Jodhpur]	55
Figure 4.4: SEM Image of saltpetre or kalmishora [Carl Zeiss EVO 18 SEM, IIT Jodhpur]	55
Figure 4.5: Electrically operated pottery wheel	56
Figure 4.6: Traditional paddling tools used in Indian pottery manufacturing	57
Figure 4.7: (a) Thrown cruse (b) Paddled cruse	57
Figure 4.8: (a) Internal and (b) External surface topology of off-white pots [Carl Zeiss EVO 18 SEM, IIT Jodhp	ur]
	60
Figure 4.9: FTIR Spectra of (a) off-white water pot (b) red water pot [Origin Pro 16 Software, IIT Jodhpur	
License]	60
Figure 4.10: Strength as a function of the height of the off-white and red water pots	61
Figure 4.11: Water temperature profiles of pots during August at Jodhpur, Rajasthan, India	62
Figure 4.12: Water temperature profiles of pots during November at Jodhpur, Rajasthan, India	62
Figure 5.1: The G-filter setup in a house in Banad village, Jodhpur, Rajast han, India	66
Figure 5.2: Project management thought in western Rajasthan	67
Figure 5.3: Octagonal prism-based socio-technology project management system for G-filter knowledge dissemination [Satankar <i>et al.</i> , 2018]	68
Figure 5.4: G-filter manufacturing steps	69
Figure 5.5:The geometrical arrangement of filter greenware (G-filter) within the up-draught furnace	
(Solidworks, 2015, IIT Jodhpur License)	70
Figure 5.6: Time history of measured overall temperature variation in the furnace that precludes cracking of	
the G-filter	70
Figure 5.7: The percolation rate of the G-filter in the completely filled condition	71
Figure 5.8: Compressive strength as a function of the density of G-filter material	72
Figure 5.9: Schematic of the microbial filtration set-up	73
Figure 6.1: SCMI-based products and processes	75