MANUFACTURING CELLULOSE, ALPHA CELLULOSE, NANOCELLULOSE ,LEGNIN AEBSTRACTED FROM CATTLE WASTE & ITS INDUSTRIES & ECONOMIC POTENTIAL IN NEPAL

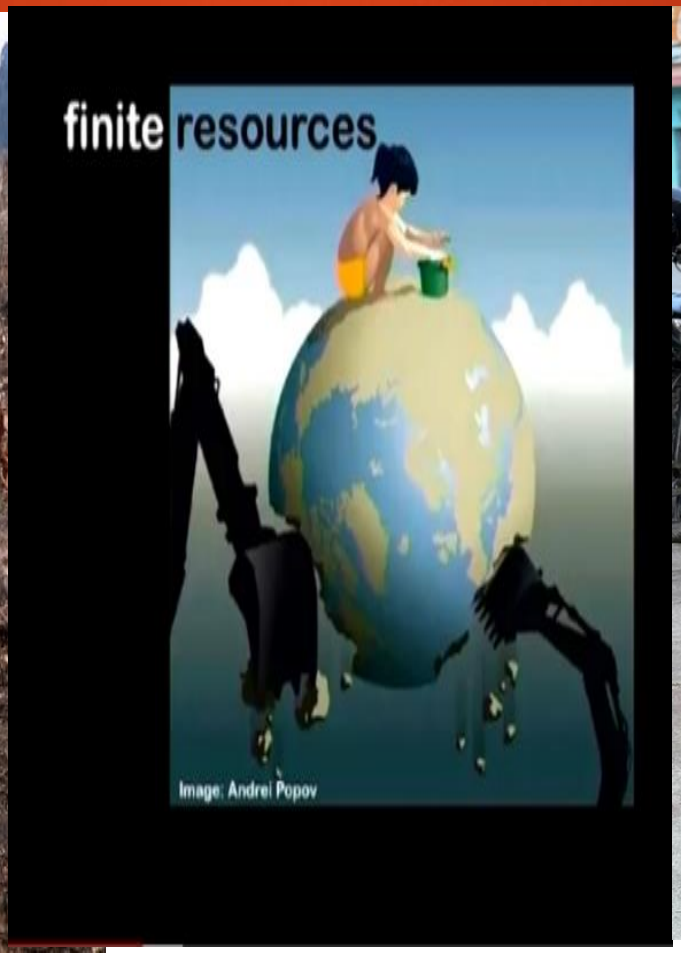
KUNDAN KUMAR DAS

PH.D. SCHOLAR, C.U

M.TECH . VELTECH DEEMED UNIVERSITY(CHENNAI)

B.E T.U (WRC) , DIPLOMA T.U(ERC)

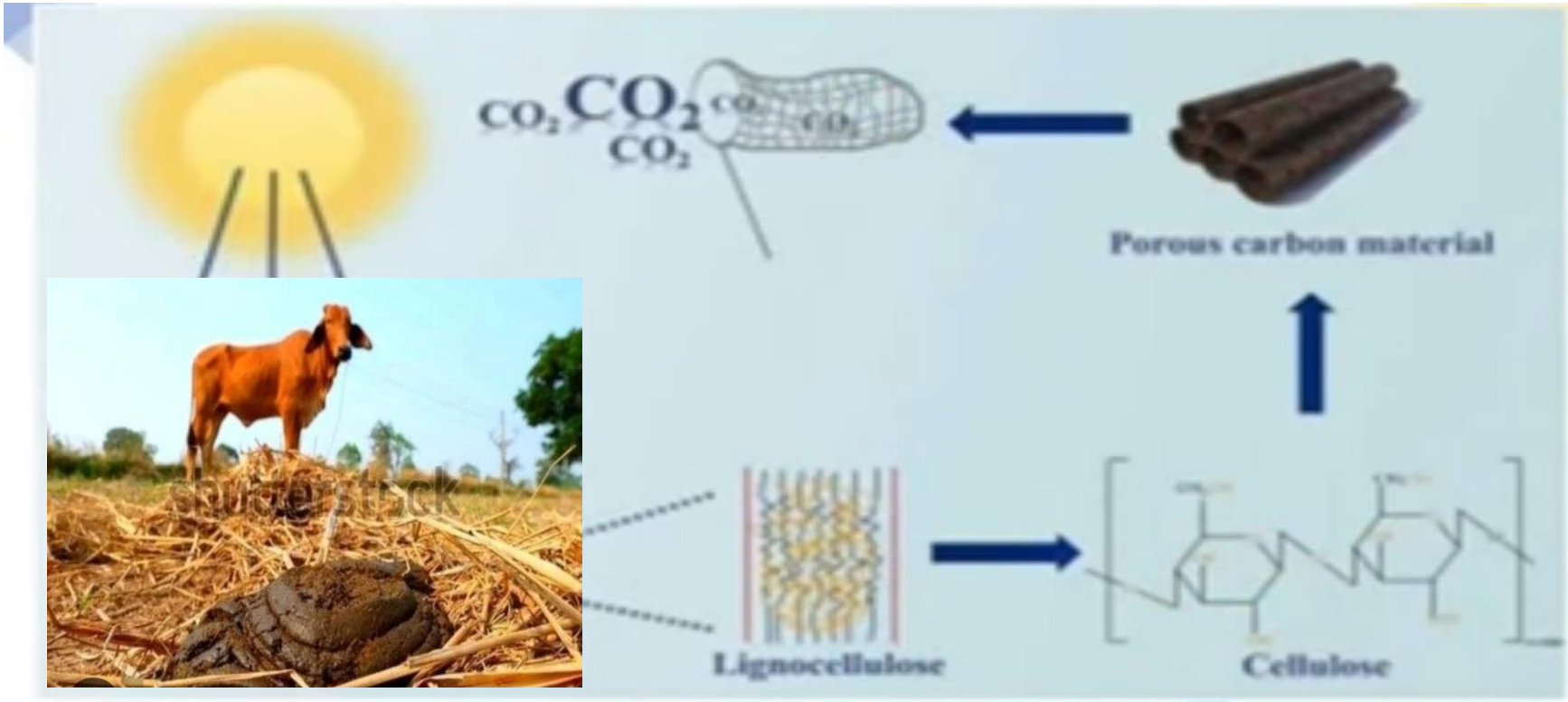
CURRENT SUITATION OF OUR HOME PLANET



CELLULOSE ,NANOCELLULOSE LIGNINE

- Ecofriendly sustainable renewable material, not only converting waste to consumable but also for economical growth at ground level from waste to wealth. Mobilization of country resource, social responsibility towards cow to bringing from road to gaushala, as cow give milk only for certain period but cow dung can be achieved whole life. Can be started at mini to micro level project. In aspect of environment, decreasing the carbon footprints, balancing the ecosystem. Wide range of application specially construction industries, cosmetic, sustainable pharma industry, petrochemical etc., Excellent favorable climate temperature, geography for cow breeding in Nepal. Alternative to industry who abstract cellulose from Plant Biomass.

Science Behind Cow



Comparison of Wood extracted cellulose vs Cow Dung Cellulose

Cow Dung based cellulose

- Sustainable
- Reduce Chemical Treatment as it is received in pre digested form
- Reduce carbon footprints.
- Economy as it reduce three to four chamber while processing

Plant biomass based cellulose

- Unsustainable
- Increase Chemical treatment while Kraft pulping and bleaching
- Increase carbon footprints
- Comparative Uneconomical,

Cow Science Blueprint

- Cow Science 1.0

Pnachyagavya Product (Block, Pots, CNG , Fertilizer etc)

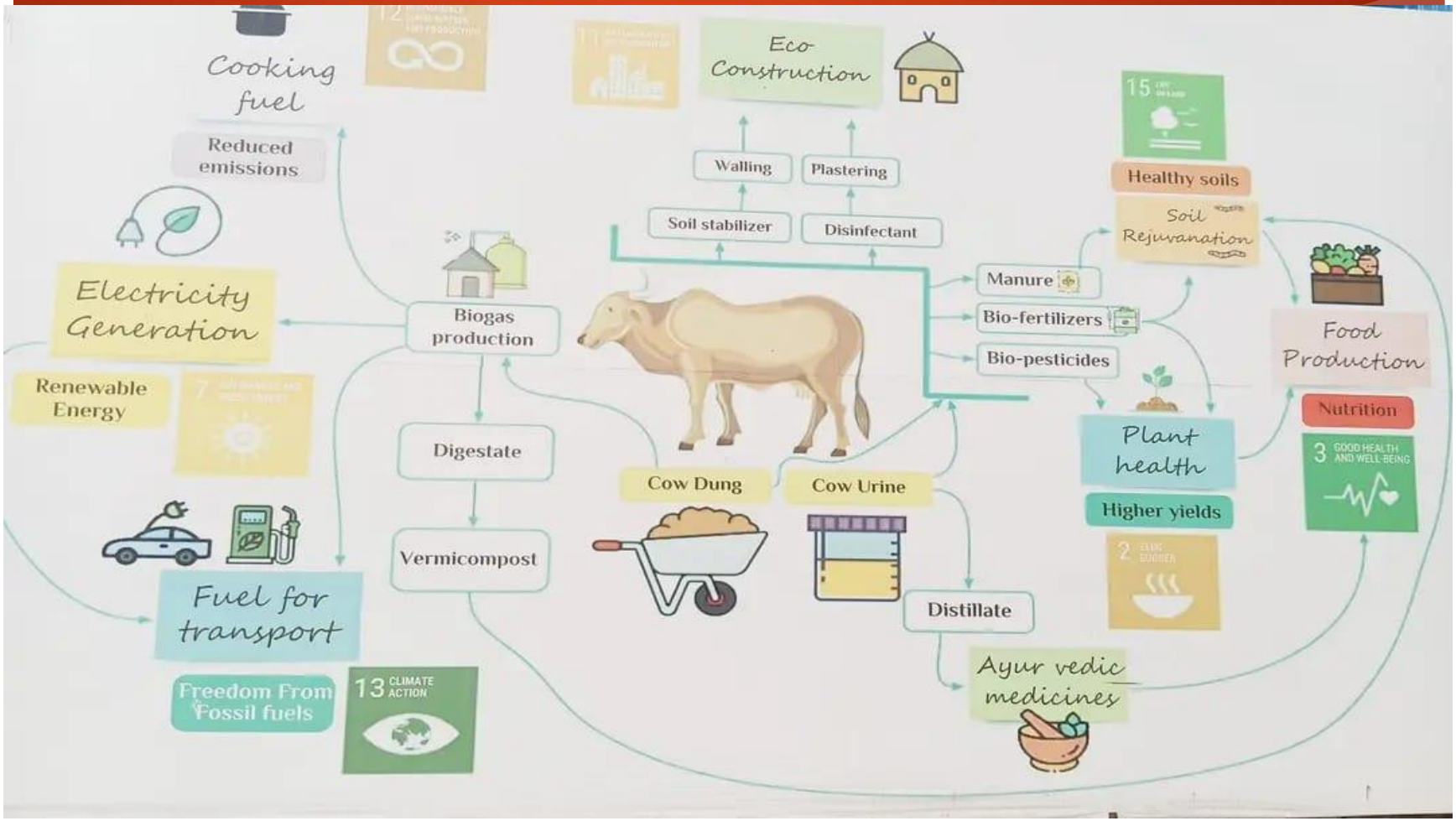
- Cow Science 2.0

Biomaterial Revolution (Separation of composition of material of cow dung e.g. Cellulose, Nano cellulose, lignin)

- Cow Science3.0

Universe, Environment sustainability, Water Conservation

EXECUTION MODEL



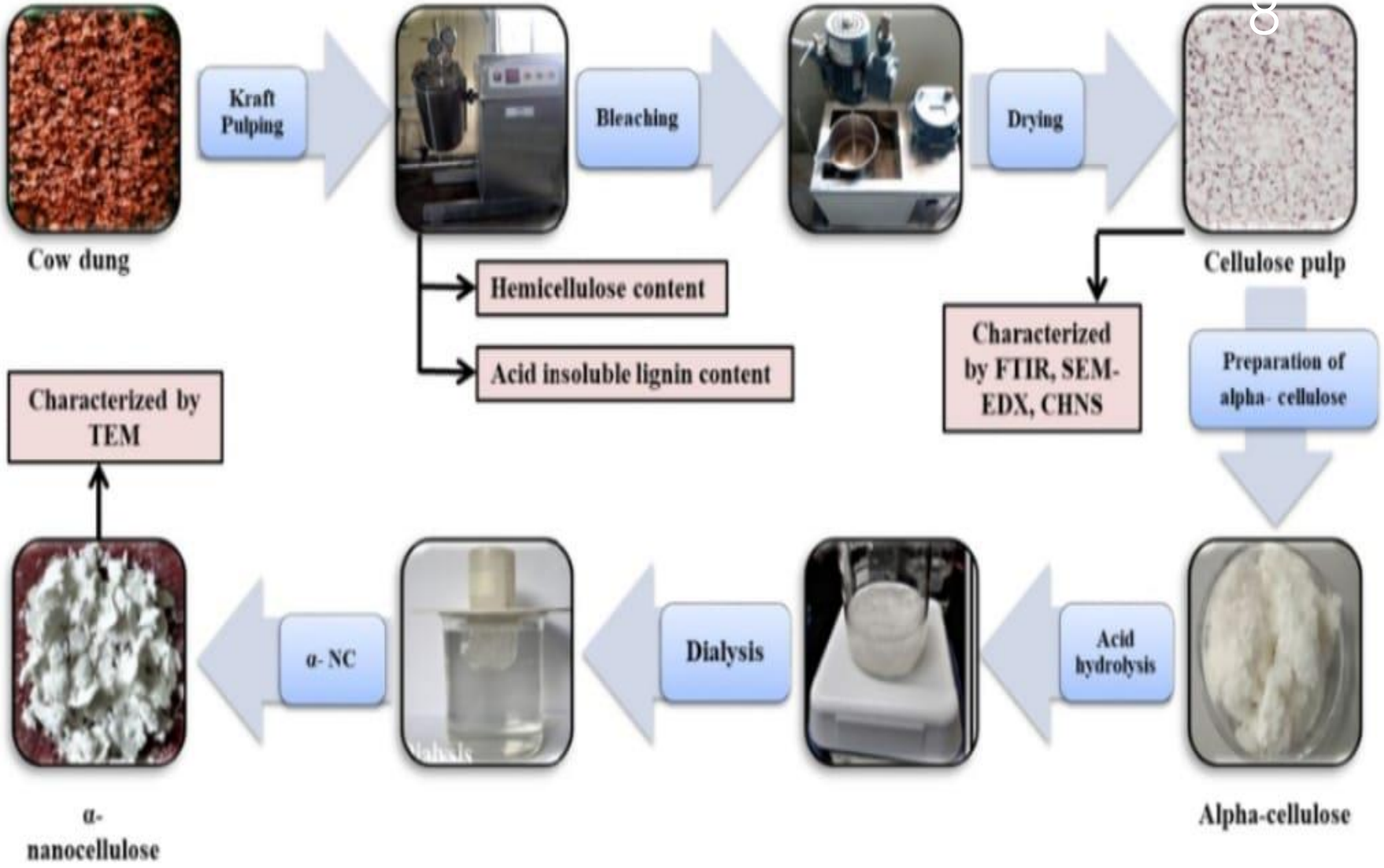


Fig. 1 Schematic view of extraction of cellulose and preparation of nanocellulose from cow dung using different chemical and mechanical treatments

Propertiesof Nanocellulose &Its Application

- High surface area (>250 sq.m/gm)
- High tensile strength (8 Gpa)
- Strong ,lightweight ,biomaterial platform
- Fully biodegradable

- APPLICATION
- Cement, Ceramics, Paper, Packaging, Cosmetic, Paints, Sustainable Health sector

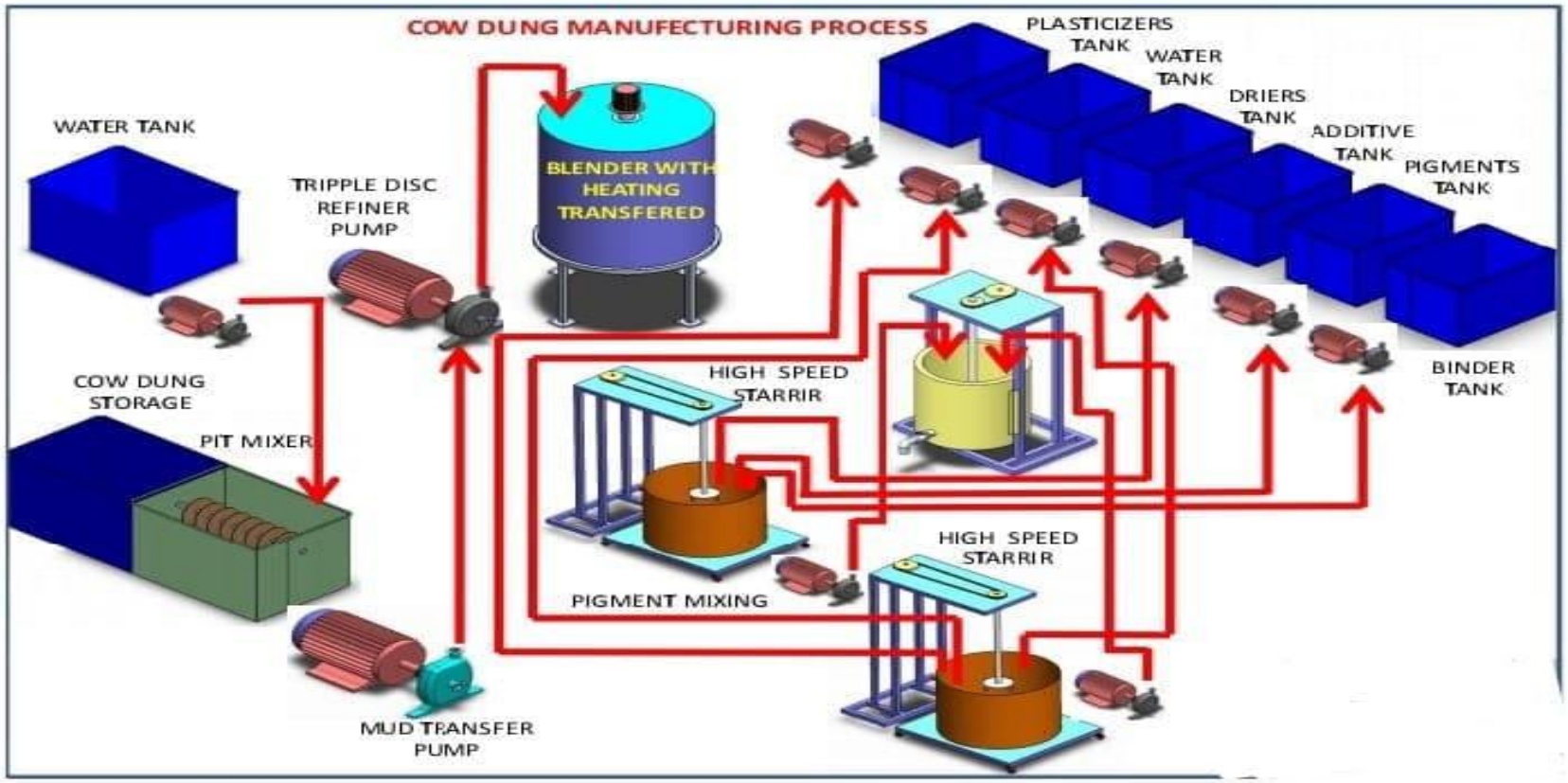
Source IIT BOMBAY ;Dr. J.S, Billera Dr. S.P

Cattle Population Over Last 10 years In Nepal

Category	2013/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	2023/2024
CATTLE	7243916	7241743	7302808	7347487	7376306	7385035	7458885	7466841	7413197	4750329	51,98,388
MILKING COW	1024513	1025947	1026135	1029529	1039538	1078775	1166156	1209041	1223061	916579	10,63,189

Unit :number,
Source:Ministry of Agriculture &Livestock development ,Hariharbhawan

PLANT OVERVIEW



CELLULOSE Composition In Water Based Paint Emulsion

- 100 kg PER
- WATER 30%
- CMC 15%
- GUARGUM.5%
- LIME STONE , Cnina Clay,Dolomite,Shmp, Deformer 40%
- TITANIUM DIOXIDE 10%
- BINDER 10%, Calcite 700 micron, Pine oil,Dry Film,OP 66

MANUFACTURING PROCESS

- PREPARATION OF CMC(CARBOXY METHYL CELLULOSE)
- REFINING, BLEACHING

VALUE PROPOSITION

Health Aspect

Environment Aspect

CARBON CARE™
ENVIRO-ACCESS

Economic & Natural Aspect

TOTAL MARKET SIZE

60 Billion

CMC Imported

3 Billion

If manufactured in country

1 Billion

Cow dung purchased from farmer for CMC manufacture minimum 25 cr.

Asian >50%

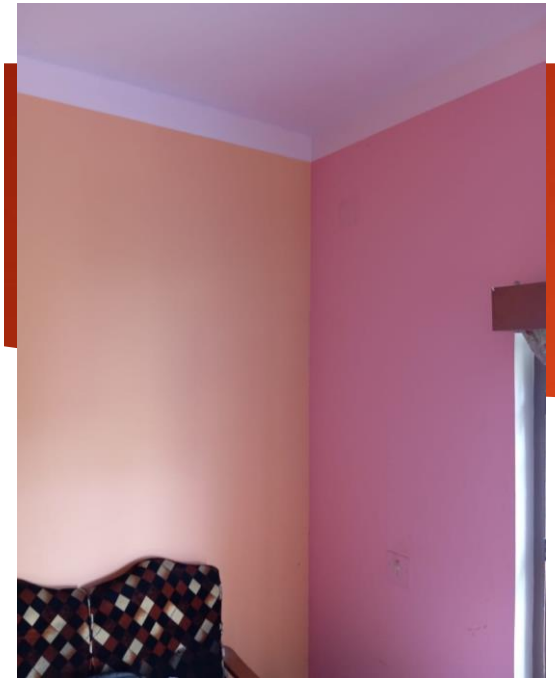
Berger>15%

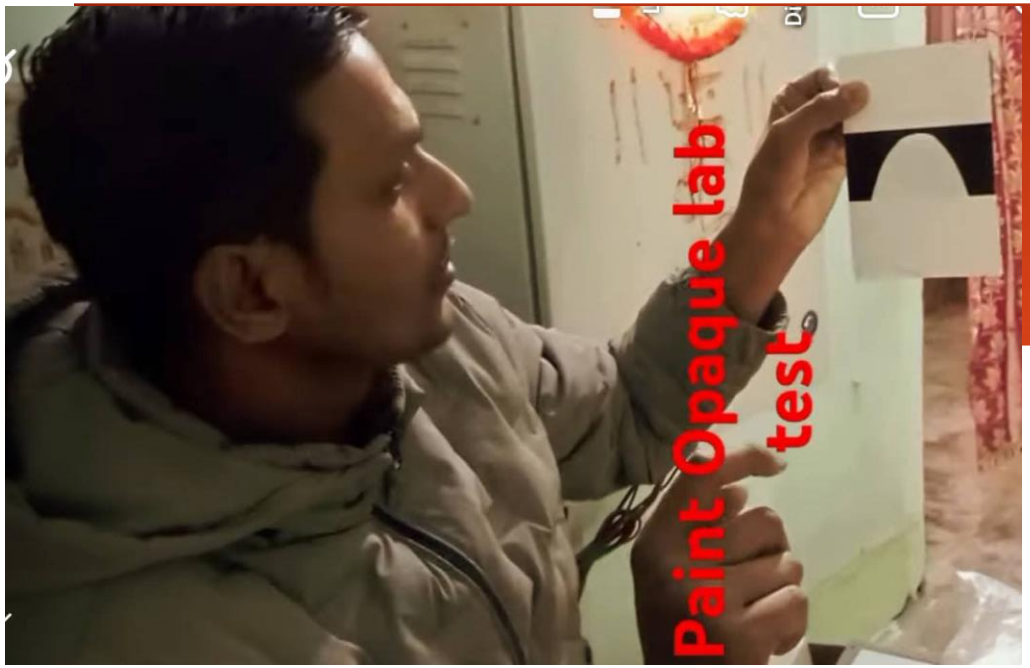
KNP>10%

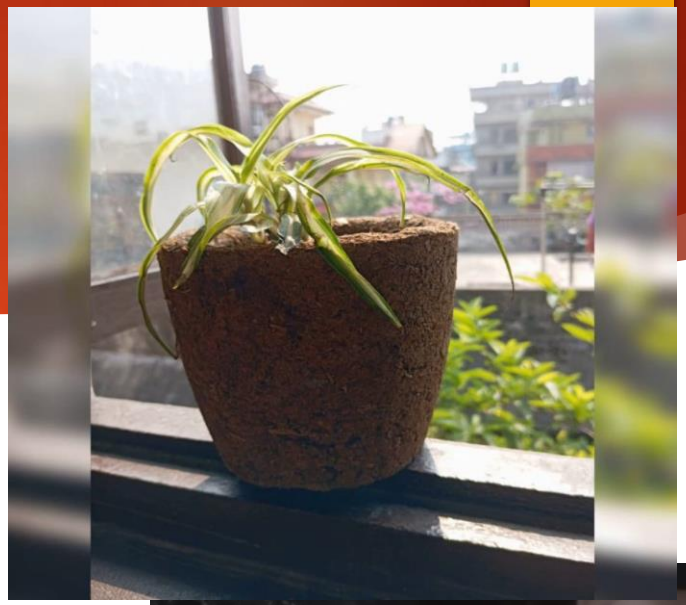
Dulex >5%

Remaining paint industy>20%


COW DUNG PLANT
PUG MILL
TANK
PRE MIXER
BEED MILL
BLEACHING TANK
HIGH
DISP
TRIPPLE DISC REFINER




Paint Opaque lab
test



Circular Bio economy Model

- Reduce methane emission and deforestation
- Generate Rural employment and Sustainable value
- Embodied waste to wellness , circulation innovation
- Zero waste biorefinery process.

Advantage of other chemical based matetial over Organic Material