1. Title of the project

Valorization of chicken skin waste towards Swachh Bharat Mission

2. Name of the College & Department

School of Engineering and Technology, CHRIST University

Department of Mechanical and Automobile Engineering

3. Name of the Students & Guide(s) (with email id and cell no. if any)

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4. Keywords

Chicken Skin, Reactor, Optimisation, Biofuel

5. Introduction / background (with specific reference to the project, work done earlier, etc)

According to the Ministry of Fisheries, Animal Husbandry & Dairying (India), Karnataka produced 140 thousand metric tons of poultry meat for 2019, and a 60% increase was tabulated from 2017 to 2019. By 2022, it is predicted that Karnataka may consume at least 250 thousand metric tons of poultry meat. Bengaluru, a major Information Technology hub and cosmopolitan city accounting for a population of 1.42 crore, consumes 30% of the meat consumption of whole Karnataka. So, in 2022, Bengaluru alone will consume 75 thousand metric tons of poultry meat per year. Urbanization, drastic change in food habits and health-conscious people consuming chicken without skin are increasing drastically and contributing to animal waste. Our research team survey at identified Bengaluru clusters concluded that 70% to 80% of consumers consume poultry meat without skin. It can be supposed that by 2022 around 50 thousand metric tons of poultry meat will be consumed without the skin. On average, 1 kg of poultry meat produces 0.2 kilograms of skin waste, accounting for 10 thousand metric tons of waste chicken skin by 2022.

6. Objectives (about 10 lines)

- To extract fat from waste chicken skin
- To investigate the possibility of extracted fat into edible oil
- To use the extracted fat as biofuel in automotive applications
- Educating and creating awareness on separating the chicken skin waste from poultry meat waste

7. Methodology (about 30 lines) (materials, methods, details of work carried out, including drawings, diagrams etc)

The proposed research mitigates the chicken skin waste from the poultry meat industry and serves as the source for edible oil or biofuel.

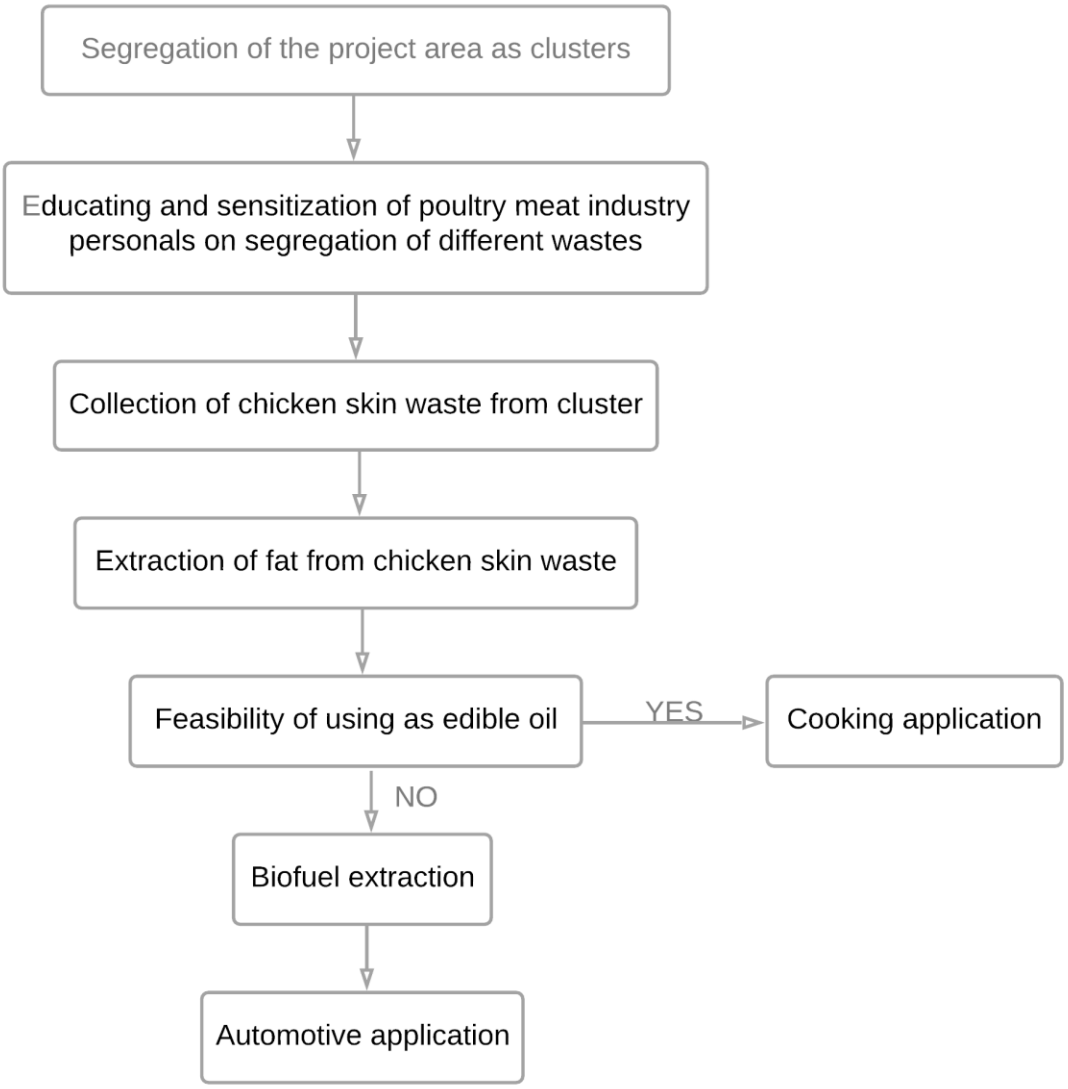

Fig. 1. Methodology

8. Results and Conclusions (about 20 lines with specific reference to work carried out)

Fig. 2. Waste Chicken Skin

Fig. 3. Heating

Fig. 4. Fat

Sl NO	SHOP NAME	AREA	WASTE in kg/Day	PROCESS
01	AMERI CHICKEN CENTRE	KST	10-15	**CORPORATION**
02	POLPULOR CHECKEN CENTRE-2	KST	25-30	PIG FARM
03	G K CHICKEN STALL-2	KST	15-20	PIG FARM
04	KABBALAMMA CHICKEN STALL	KST	10-12	**CORPORATION**
05	MANDYA CHICKEN CENTRE	KST	10-15	**CORPORATION**
06	HKGN CHICKEN SHOP	KU	10-15	**FISH FARM**
07	G K CHICKEN STALL-1	KU	20-25	PIG FARM
08	POLPULOR CHECKEN CENTRE-1	KU	30-40	PIG FARM
09	SHARATH PIG MUTTON CENTRE	K-PS	5-8	**CORPORATION**
10	RANJITH MUTTON CENTRE	KU	8-10	**CORPORATION**
11	H S J CHICKEN SHOP	KST	12-18	FISH FARM
12	FRESH CHICKEN TO HOME	KST	40-50	FF & PF

Average of waste :195 -258 kg/Day

Table. 1. Source for chicken skin tallow

Sl No	Waste chicken skin (kg)	Fat (kg)	Waste chicken skin after processing (kg)
01	1	0.180	0.730
02		0.140	0.710
03		0.200	0.740
04		0.160	0.770

Table. 2. Chicken fat yield

Transesterification process

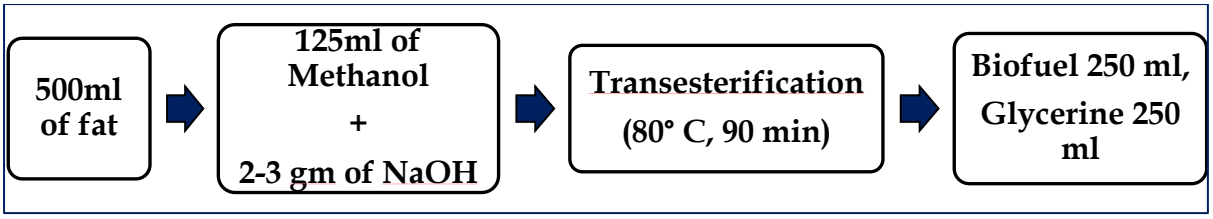

Fig.5. Biofuel samples of blends with diesel

9. Scope for future work (about 20 lines).

Valorization of chicken skin waste offers significant opportunities to contribute to the Swachh Bharat Mission and address environmental challenges in India. Key areas for future work in this domain include: efficient extraction of collagen for biomedical applications, extraction of bioactive compounds for pharmaceuticals and nutraceuticals, biogas production for renewable energy, production of bio-based materials as alternatives to fossil-based plastics, development of value-added products like pet food or organic fertilizers, waste-to-energy conversion through pyrolysis or gasification, comprehensive environmental impact assessments, economic feasibility analyses, optimization of extraction processes, quality and safety evaluations, technological scale-up, public awareness campaigns, policy and regulatory frameworks, collaborative research and partnerships, life cycle assessments, upcycling and product diversification, consideration of social and cultural aspects, educational initiatives, international collaboration, monitoring and evaluation frameworks. Pursuing these research areas will contribute to sustainable

waste management, resource recovery, and the achievement of a cleaner and more prosperous India.