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### A Review on Agriculture Waste using TOPSIS MCDM Method

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#### Abstract

Agricultural wastes are various agricultural Productions as a result of activities is the waste generated. Agricultural waste is waste produced as a result of various agricultural activities. These include manure and other wastes from farms, poultry farms and slaughterhouses; Harvest waste; runoff of fertilizers from fields; Pesticides entering water, air or soil; using this, salt and silt are filtered from the fields. TOPSIS (ideal by analogy with the solution technique for priority order) analysis using the Corn cob, Rice hulls, Banana stem W. split leaves, coconut shell, S. Wallisiana stem Alternative value and Hydrolytic pNPP activity (U/g Support), of palm oil Hydrolytic Function (U/g support), Protein Loading (%), Immobility ability (%) evaluation Parameters in value. S. wallichiana stem whereas first rank has received the Rice hulls is having the Lowest rank.

**Keywords:** MCDM, Corn Hammock tip, Rice hulls, Banana stalk, W.bifurcate leaves.

#### 1. Introduction

Agricultural wastes are various agricultural as a result of actions will be produced are waste. Farms, these include Poultry farms and slaughterhouses manure from barns and other wastes; Harvest waste; Flow of fertilizers in the fields from; Pesticides entering water, air or soil; and salt and sediment drainage in the fields from. Agriculture waste is the direct product from agricultural activities Unwanted or unmarketable material produced for the primary purpose of profit or subsistence, such as growing crops or raising animals. Agricultural wastes are crops, horticulture or Produced by livestock production practices any waste material natural waste such as stream, bags, cartons, structural materials and wood waste and plant material from agricultural operations. Do not add land clearing waste; Buildings (including demolished/demolished warehouses); Trash; manufacturer open burning unless otherwise identified as safe disposal process. Agricultural wastes are waterborne liquid, gas, or solids arising from agricultural industry and agricultural operations, including farm livestock feeding pens and spaces, housing and farm animal feeding structures, and agricultural product processing facilities. Criterion is a method of decision analysis. Its alternatives based on the criteria mentioned before Compares the set. This time in various industries used in business, each time an analytical decision needs o be made based on the collected data. Imagine a situation where you Compare many companies, which company has strong financials should be found to contain these companies are ours alternate systems. Put them together and use some reliable metrics to determine which is stronger. In such a situation, some indicators derived from financial statements Can be used, for example, ROA (on assets Revenue), ROE (Return on Equity), DR (Debt Ratio) or CG (Capital Gear). These indicators are formed our benchmarks. Such a method is inter-criterion; one's Poor performance is good when canceled by performance of another Allows you to find trade-offs. Alternate based on predefined thresholds it's a beautiful one because we don't exclude solutions Provides detailed sample format.

#### 2. Agriculture Waste

Agriculture favorable for plantations in Southeast Asian region due to Important in industries one conditions. Actually, Southeast Asia World's largest palm oil producer and is a producer of coconuts. However, vast gardens of these agricultural products are among these industries it leads to the same amount of waste products that exits. [1]. However, this of agriculture Residues including phenolic compounds Rich in bioactive compounds found naturally in plants as secondary metabolites they are antioxidant, anti-inflammatory, cardio exhibit protective and anticancer abilities. Several extractions are suitable in agricultural by-products this advantage from Scary compounds for isolation although the techniques exist; their industrial application is a real application on an industrial scale. without has functional Phenolic compounds to achieve recovery can; getting things new it is to be can put back in economics materials [2]. Unfortunately, chemical activation methods basically an activated carbon production machine reduces strength; some of this is during wastewater treatment Creates problems. I.e. the pressure drop in the actual system and Purity of discharge. To overcome these problems, the palletization of agricultural wastes the quantity cannot be reduced below the specified value [18]. Main objective the paper examines of agricultural waste Effects (Rice Straw, sugar cane and wheat) (straw ash). This article discusses physic-Clay bricks mechanical properties during and microstructure are combined with sewage treatment plant (SWTP) sludge Amend the clay at a rate of 50%. A composition as a control prepared mixture without agricultural waste [5]. Production of bio fuels and Bacteria-assisted CO<sub>2</sub> reduction chemicals close the fuel carbon cycle and source hydrocarbons they have the ability to reduce extraction. This technology displaces CO<sub>2</sub> and is always growing A recent boom in natural gas development is enabled by treating the incoming sulfur

waste stream. Unlike current methods of bio processing sulfur-containing waste streams, this organism reduces potential pollution and No need for expensive electron sources. This is achieved by processing sulfurous at a low price valuable to produce goods waste streams, low waste feed expenses and reduced electricity requirements. This technology was developed earlier an electrochemical-based bio fuels and Chemical production process, which contains iron CO<sub>2</sub> through waste bacteria using it as fodder for change [14]. Palm oil fuel ash (POFA) oil palm waste Formed from combustion. This is considered gray an environmental hazard as it is dumped unprofitably and without recycling, thereby Environmental issues and to human health Harmful. However, POFA is a pozzolanic the material has been proven to be used as a cement substitute in concrete. When POFA is heated at higher temperatures, it exhibits better pozzolanic performance. In this study, curing processes and microstructure of POFA structure and pozzolanic properties are considered. Ordinary Portland cement 0, 30, 50 and 70% treatment was converted into paste containing POFA (T-POFA). [15]. In this study, the oxidation of iron oxide, Fe<sub>2</sub>O<sub>3</sub>, using discharged agricultural waste was carried out using durian skin in an electric muffle furnace under vacuum conditions. A new method for magnetic biomass production has been developed. Pyrolysis temperature, pyrolysis in magnetic bio char production like time process of parameters effect and frequency of sonication was investigated. [10]. Waste garlic skins from local food vendors in Bangalore, India were collected. (PVDF), carbon black, and a glass microfiber filter from Sigma-Aldrich the membrane was purchased from polyvinylidene difluoride. N-methyl-2-pyrrolidone (NMP) Spectrochem, India Purchased from Potassium hydroxide (KOH) was purchased from Finer, India. Coin Cell Components (Type 2032) Xiamen TOB New Energy, China Technologies 0.2 mm thick stainless steel feet the molecule was purchased from a local vendor. Millipore water was used throughout the experiments. [7]. these are usually industrial or agricultural residues that are Industrial sewage or contaminated ground water Used for purification. Further, various organic application or biologically derived residues such as wood chips, seeds and algae has also been included in the research. The use of these residues, commonly known as bio sorption with an adsorbent prescribed as a bio sorbent, is important as many inorganic contaminants have been removed by various bio sorbents - including copper to some extent. Mineral contamination of Chilean copper smelting waste water. However, an optimal bio sorbent for copper removal from acidic wastewater still needs to be discovered. [3]. from wood polymer residues Activated carbon can be produced and agricultural waste. Currently the cheapest and available precursors Regardless, there are an increasing tendency to produce from biology implemented Carbon and agricultural wastes as they accumulate in the lithosphere. So, past over the years, researchers have used palm and acorn shells, cherry stone, apricot stone, and fox. Nut and walnut shell to prepare activated carbon [12]. In addition to natural fibers, more attention is paid to inclusion. Agricultural Rice husk and walnut such as shell particles by various researchers Waste as polymeric composites have been changed. in polymer composites them of application convenience is that biodegradable particles are obtained from agricultural waste as easily as possible at zero cost, improving the thermal, indigenous and physico-mechanical properties of the composites. [13]. A corn cob, also called a corn stalk, corn on the cob, or corn, the central core of an ear of corn (also known as corn). This is the kernels growing ear area. The ear is considered a "cob" or "pole", but until the ear is shrunken or vegetative it is not fully "polar" until it is removed from the material surrounding the ear. Paddy husk (or rice husk) is of rice grains tough defense is the envelope. When growing season In addition to protecting the rice, the paddy husks can be used as construction material, fertilizer, insulation or fuel. Banana Stem The banana stem is in the middle of the plant. The stem is the trunk of the banana plant. The banana stem produces a large flower cluster and then dies. When bananas are plump and ready to ripen, the stem is usually cut. Before it dies, there are many things a banana stem can be used for. W. bifurcate leaves Bifurcate means dividing or branching into two branches. Like a river splits into two branches things can split by themselves or passively or by someone else, like we split the road into two lanes so many people can leave at the same time. Coconut husks The fibers from coconut husks, known as coir, are versatile and can be used in a variety of applications: coconut husk chips are used as a planting medium to help retain plant moisture and prevent fungal growth; Coconut is used to make shavings and brushes or to make rope, particle board and S. wallichiana trunk In its natural habitat, the tree can grow up to 50 m tall, but in cultivation it is usually smaller. The stem is smooth and dark gray at first, but later falls off in plates. Blue frosted needles are curved, remarkably long and thin, and hang straight down, especially from young branches. Hydrolytic activity of pNPP (U/g support). PRPP is a substrate in many substitution reactions, most of which involve nitrogen-containing compounds. At C-1 of the reactive ribose block occurs and the inversion of configuration of this carbon and PPi continues as a leaving group. Of palm oil Hydrolytic activity (Current industry in process, raw Fat in palm oil acids and glycerol are hydrolyzed to achieve 96-99% conversion in 2 hours 250 degrees Celsius and 50 bars under pressure. Protein loading (%) This is the process of using protein, especially to build your muscles and other connective tissues. And may require some work to adjust. Generally speaking, higher protein synthesis is better - it stimulates muscle fiber growth. And overall increase in health, immobilization efficiency (%) is promising for all immobilized enzymes using SnO<sub>2</sub> hollow Nano tubes as support, lipase high protein loading value 217 mg/g, immobilization Yield 93%, and immobility ability 89%. by various analytical methods of immobilized enzymes Fully classified.

### 3. TOPSIS

A-TOPSIS has a very simple calculation process, in various fields of knowledge Encourage the researcher/ practitioner to use TOPSIS is well established and it is a reliable that method pay attention should take [6]. Hwang in TOPSIS, 1981 and Yoon by was created; simple grading system is in conception and use. Standard TOPSIS method, while on the plus side, it is better A short distance from the solution is from the negative-optimal solution is far away Trying to choose alternatives. A positive best solution benefits criteria increases and decreases the cost scale, whereas negative best solution cost criteria Increases and decreases benefit criteria [1]. However, TOPSIS is concerned with the of the normalization technique Type, on data its effect and its final exam as a result, many problems have been encountered. In addition, distance measurement using TOPSIS uses different techniques to measure the Between PIS and NIS distance, each The technique also provides different results [7]. The objective of this the research aims of various problem systems Very suitable for lower TOPSIS normalization process to identify. In the next sections, general MADM let us explain the problem structure, normalization procedures and the

introduction of the First the TOPSIS method. Performance measures, Simulation tests and results we provide and discuss [8]. TOPSIS is from finite alternatives a multi-criteria method for finding solutions. The chosen alternative is positive ideal far from solution basic at a distance policy is there keep the distance short and negative from the best solution far away has [10]. TOPSIS is more useful than other met heuristics due to its characteristics fewer parameters, more stability and less computational Try. TOPSIS is a multi-attribute decision making method, which Multiple response values as one performance response value changes. TOPSIS algorithm by Hwang and Yoon in 1981 Created by and from the selected alternative optimal solution The idea of short Euclidean distance Based on that the negative must be far from the optimal solution. An optimal solution is a hypothetical All in the database with satisfactory solutions A solution where the attribute values are also the maximum attribute, corresponding to the values; The best solution for the negative is an A hypothetical solution [15]. A set of MCDM methods VIKOR and TOPSIS of points indicate proximity. TOPSIS method vector using normalization [11]. and measure The distance between two triangular fuzzy numbers, here we propose a vertex method, which Fuzzy TOPSIS process. An effective and simple method of extending context. [12]. Standard steps for TOPSIS method are (i) Normalized Creation of decision matrix; (ii) Of the result matrix weighted normalized formulation; (iii) Optimum and negative-optimal solution determination; (iv) separation ratio calculation; (v) Calculating relative proximity to solutions; and (vi) Rank in order priority [13]. Various multi-criteria techniques exist to aid selection in multi-criteria situations. TOPSIS stands for Prioritization by Similarity of Best Solution refers to the technique [2]. The purpose of fuzzy TOPSIS methods of this review paper is to provide a general overview of development. We are a literate, and we start with the review A variety of fuzzy used in the field of decision making Let's explore the models. Finally, some obscure topsies We present applications [3]. Topsis is considered in Key Decision Making Techniques in the Asia Pacific Region One. In recent years, human resource management, Transportation, product design, manufacturing, water management, in the fields of quality control and location analysis TOPSIS is used successfully. was used. Additionally, the concept of TOPSIS is linked for multi-objective decision making and group decision making. More of this concept Flexibility allows further stretching to make better choices in different situations. This is the motivation of our study. Certain groups within organizations difficult decisions are not uncommon. However, any MADM Also to use the technique, eg, TOPSIS, is usually decision making Information is assumed to be provided in advance by a group or task. force. [4]. Many methods have been developed to solve ma problems. Methods developed based on multi-attribute utility theory, the problem of inter-firm comparison requires a substantive choice of alternatives. In this thesis, to solve the problem the concept of the approach used is better, for the solution Order Selection by Similarity (TOPSIS). Based on technique [5].

#### 4. Analysis and Discussion

Table 1 - Agriculture Waste

	Hydrolytic activity of pNPP (U/g support).	Hydrolytic activity of palm oil (U/g support)	Protein loading (%)	immobilization efficiency (%)
<b>Corn Hammock tip</b>	34.22	140.30	26.35	22.05
<b>Rice hulls</b>	32.25	148.36	33.69	27.30
<b>Banana stalk</b>	27.26	126.77	29.18	23.10
<b>W.bifurcate leaves</b>	24.29	124.22	24.60	17.59
<b>Coconut husks</b>	31.23	145.27	27.96	18.89
<b>S. wallichiana stem</b>	<b>30.43</b>	<b>150.1</b>	<b>15</b>	<b>10</b>

Table 1 shows the Agriculture Waste for Analysis using the TOPSIS Method. Hydrolytic pNPP activity (U/g support), of palm oil activity Hydrolytic (U/g support), protein loading (%), immobilization Capacity (%). Corn Hammock tip, Rice hulls, banana stem, W. two leaves, coconut shell, S. Wallisiana stem.

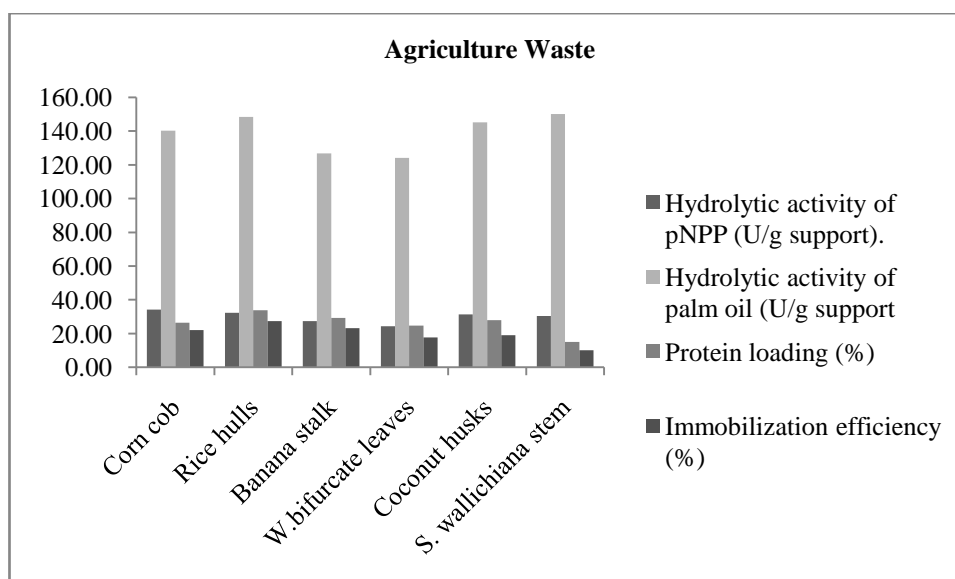


Figure 1 - Agriculture Waste

Figure 1 Shows Agriculture Waste like Corn Hammock tip, Rice hulls, banana stem, W. two leaves, coconut shell, S. Wallisianastem. From Figure 1 and Table 1, corn Displays the maximum value for the cage Hydrolytic activity of pNPP (U/g support), and W.bifurcate leaves is showing the lowest value. S. wallichiana stem is showing the Highest Value for Hydrolytic of palm oil Function (U/g support), and W.bifurcate leaves is showing the Lower value. Rice hulls is showing the Highest Value for Protein loading (%) and S. wallichiana stem is showing the lowest value. Rice hulls are showing the Highest Value for Immobilization efficiency (%) and S. wallichiana stem is showing the lowest value.

$$X_{n1} = \frac{X1}{\sqrt{((X1)^2+(X2)^2+(X3)^2 \dots)}} \quad (1).$$

Table 2 - Normalized Data

Hydrolytic activity of pNPP (U/g support).	Hydrolytic activity of palm oil (U/g support)	Protein loading (%)	immobilization efficiency (%)
0.4637	0.4105	0.4022	0.4383
0.4370	0.4340	0.5142	0.5426
0.3694	0.3709	0.4454	0.4591
0.3292	0.3634	0.3755	0.3496
0.4232	0.4250	0.4267	0.3755
0.4124	0.4392	0.2289	0.1988

Table 2 shows the various Normalized Data for Hydrolytic activity of pNPP (U/g support), Hydrolytic activity of palm oil (U/g support, protein Loading (%), immobilization capacity (%)(1) Normalized value using formula is received. Table 3 for analysis Displays the weights used. For analysis We took the same weight for all the parameters.

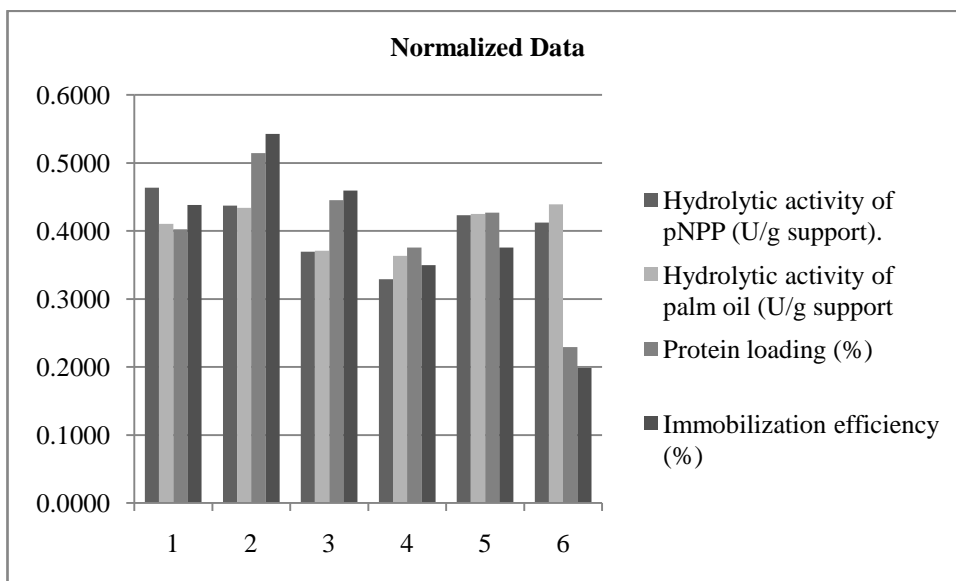


Figure 2 -Normalized Data

Figure 2 Shows the Normalized Data for Corn Hammock tip, Rice hulls, banana stem, W. two leaves, coconut shell, S. Wallisiana stem. Hydrolytic activity of pNPP (U/g support), Hydrolytic activity of palm oil (U/g support, protein Loading (%), immobilization capacity (%) Normalized value.

Table 3 - Weightages

Weightages			
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25

$$X_{wnormal1} = X_{n1} \times w_1 \quad (2).$$

Table 4 - Weighted normalized result matrix

	Weighted normalized result matrix			
Corn cob	0.1159	0.1026	0.1005	0.1096
Rice hulls	0.1093	0.1085	0.1286	0.1357
Banana stalk	0.0924	0.0927	0.1113	0.1148
W.bifurcate leaves	0.0823	0.0909	0.0939	0.0874
Coconut husks	0.1058	0.1063	0.1067	0.0939
S. wallichiana stem	0.1031	0.1098	0.0572	0.0497

Table 4 shows weighted normalized decision matrix for Hydrolytic activity of pNPP (U/g support), Hydrolytic activity of palm oil (U/g support, protein Loading (%), immobilization capacity (%). To figure out The weighted normalized result matrix, we used formula (2).

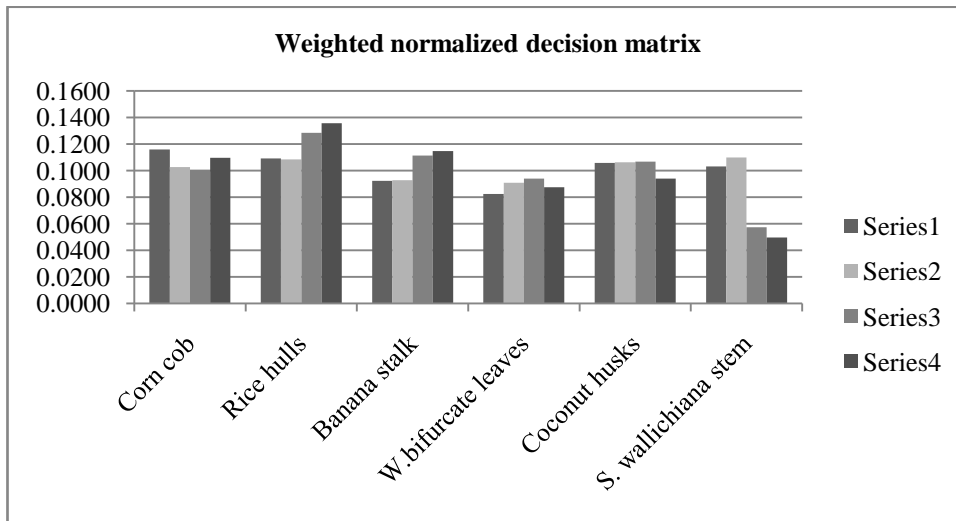


Figure 3 -Weighted normalized result matrix

Table 4 shows weighted normalized result matrix for Hydrolytic activity of pNPP (U/g support), Hydrolytic activity of palm oil (U/g support, protein Loading (%), immobilization capacity (%). To figure out the weighted normalized decision matrix, we used the formula (2).

Table 5 - Positive and Negative Matrix

Positive Matrix				Negative matrix			
0.1159	0.1098	0.0572	0.0497	0.0823	0.0909	0.1286	0.1357
0.1159	0.1098	0.0572	0.0497	0.0823	0.0909	0.1286	0.1357
0.1159	0.1098	0.0572	0.0497	0.0823	0.0909	0.1286	0.1357
0.1159	0.1098	0.0572	0.0497	0.0823	0.0909	0.1286	0.1357
0.1159	0.1098	0.0572	0.0497	0.0823	0.0909	0.1286	0.1357
0.1159	0.1098	0.0572	0.0497	0.0823	0.0909	0.1286	0.1357

Table 5 shows Positive and Negative Matrix for Corn Hammock tip, Rice hulls, banana stem, W. two leaves, coconut shell, S. Wallisianastem. In various Positive Matrix in Maximum value 0.1159, 0.1098, Minimum value 0.0572, 0.0497 is taken and for Negative matrix the Minimum value 0.0823, 0.0909 and Maximum value 0.1286, 0.1357 is taken.

Table 6 - Final Result of Agriculture Waste

	SI Plus	Si Negative	Ci	Rank
Corn hammock tips	0.0742	0.0523	0.4133	4
Rice hulls	0.1119	0.0322	0.2236	6
Banana stalk	0.0895	0.0289	0.2442	5
W.bifurcate leaves	0.0652	0.0594	0.4767	2
Coconut husks	0.0672	0.0549	0.4497	3
S. wallichiana stem	0.0128	0.1152	0.8997	1

Table 6 shows the final result of TOPSIS for Agriculture Waste. Figure 4, 5 shows the TOPSIS Analysis Result of Agriculture Waste. In Table 6, Si positive is calculated using the formula (3). From figure 2, In Si positive, Rice hulls is having is Higher Value and S. wallichiana stem is having Lower value. Si Negative is calculated using the formula (4). In Si Negative, S. wallichiana stem is having is Higher Value Banana stalks having Lower value. Ci is calculated using the formula (5). In Ci, S. wallichiana stem is having is Higher Value and Rice hulls is having Lower value.

$$X_{si+1} = \sqrt{((X_{wn1} - X_{p1})^2 + (Y_{wn1} - Y_{p1})^2 + (Z_{wn1} - Z_{p1})^2)} \quad (3)$$

$$X_{si-1} = \sqrt{((X_{wn1} - X_{n1})^2 + (Y_{wn1} - Y_{n1})^2 + (Z_{wn1} - Z_{n1})^2)} \quad (4)$$

$$X_{ci1} = \frac{X_{si-1}}{(X_{si+1}) + (X_{s(i-1)})} \quad (5)$$

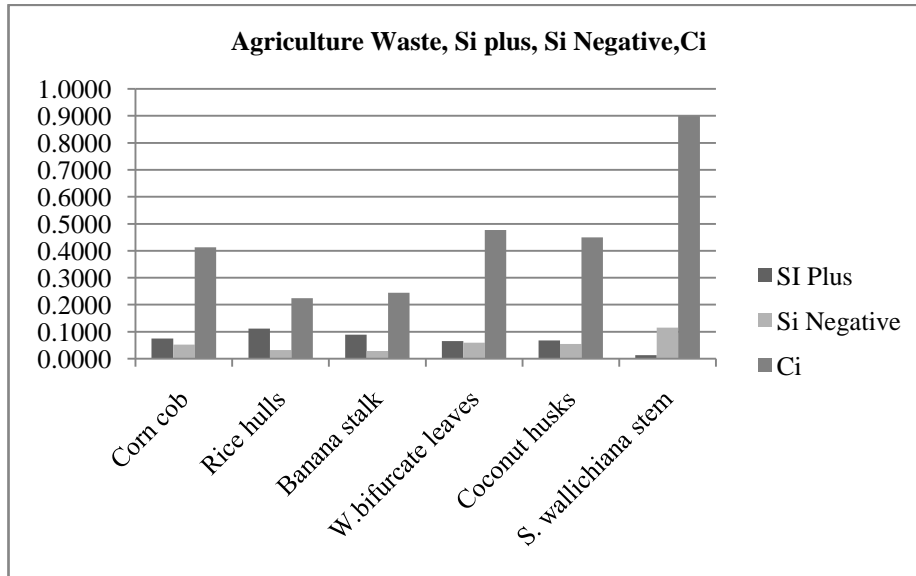


Figure 3 - Result of Agriculture Waste

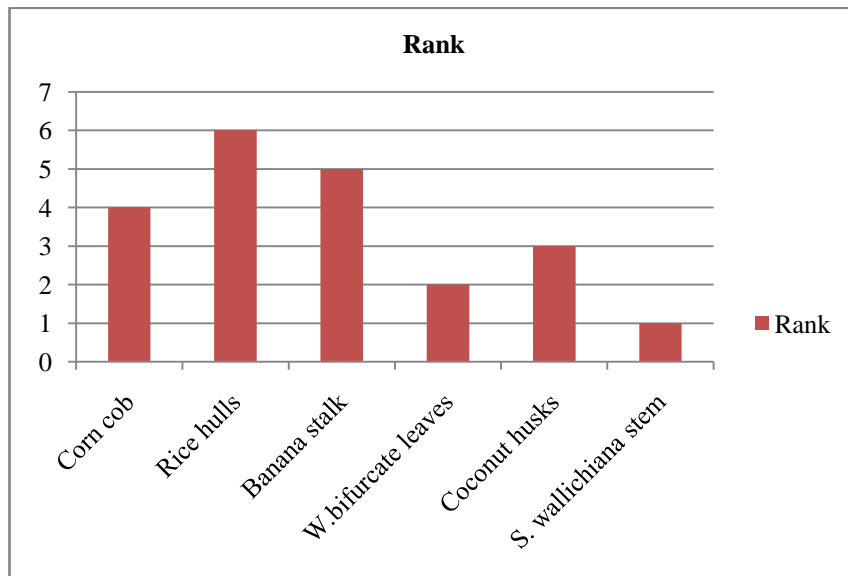


Figure 4 - Shown the Rank

Figure 4 Shows the Ranking of Agriculture Waste. S. wallichiana stem whereas first rank has received the Rice hulls is having the Lowest rank.

## 5. Conclusion

Unfortunately, chemical activation methods basically an activated carbon production machine reduces strength; some of this is during wastewater treatment Creates problems. I.e. the pressure drop in the actual system and Purity of discharge. To overcome these problems, the palletization of agricultural wastes the quantity cannot be reduced below the specified value from wood polymer residues Activated carbon can be produced and agricultural waste. Currently the cheapest and available precursors Regardless, there are an increasing tendency to produce from biology implemented Carbon and agricultural wastes as they accumulate in the lithosphere. So, past over the years, researchers have used palm and acorn shells, cherry stone, apricot stone, and fox. Nut and walnut shell to prepare activated carbon W.bifurcate leaves Bifurcate means dividing or branching into two

branches. Like a river splits into two branches things can split by themselves or passively or by someone else, like we split the road into two lanes so many people can leave at the same time. Coconut husks the fibers from coconut husks, known as coir, are versatile and can be used in a variety of applications: TOPSIS is from finite alternatives a multi-criteria method for finding solutions. The chosen alternative is positive ideal far from solution basic at a distance policy is there keep the distance short and negative from the best solution far away has.

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