

ATTITUDE TOWARD CANE WASTE MANAGEMENT IN AGRO-INDUSTRIES OF KHOUZESTAN PROVINCE

Feyzollah Malekmohammadi and *Ahmad Reza Ommani

Department of Agricultural Management, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran

*Author for Correspondence

ABSTRACT

The purpose of this research was analyzing attitude toward cane waste management in agro-industries of Khuzestan Provinc, Iran. The population of this study included staff of agro-industries. The total number of members was 1233 person. The sample size was obtained through a simple random sampling. The sample size according to the Krejcie & Morgan table was 291 (n=291). Questionnaire reliability was estimated by calculating Cronbach's alpha and it was appropriate for this study. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). To reach the research objectives, appropriate statistical procedures for description were used. Data analysis was carried out through data description and data inferential analysis. The results of research showed the correlation between level of education, technical knowledge, job satisfaction, participation in educational practices and attitude toward cane waste management in agro-industries was significant. The result of regression analysis by stepwise method indicated level of education, technical knowledge, job satisfaction and participation in educational practices may well explain for 49.5% changes ($R^2 = 0.495$) in attitude of staff.

Keywords: Attitude, Cane Waste Management in Agro-Industries, Khuzestan Province

INTRODUCTION

Good waste management on farms is essential to ensure a healthy, safe and productive farming enterprise. The by-products of agricultural activities are usually referred to as "agricultural waste" because they are not the primary products. These wastes chiefly take the form of crop residues (residual stalks, straw, leaves, roots, husks, shells etcetera) and animal waste (manures). Agricultural wastes are widely available, renewable and virtually free, hence they can be an important resource (Sabiiti *et al.*, 2005). Agricultural wastes can be used to enhance food security mainly through their use as bio-fertilizer and soil amendment, use as animal production. They contain large amounts of organic matter, and many of them can be directly added to the soil without any risk (Sabiiti, 2011).

Based on existing statistics in Iran, in average 35 percents of agricultural crops from product to consumption process converted to wastes which it can be guaranteed 15- 20 million people nutrition of peoples. Agricultural wastes occurred in cultivation, pre-harvesting, harvesting and post harvesting process but the majority of wastes was related to both stages of harvesting and post harvesting (Asadi *et al.*, 2010).

Agricultural waste materials can be used for production of bioethanol fuel. Bioethanol can be considered as the optimum alternative fuel for gasoline. Bioethanol is an environmentally friendly fuel and has the potential to provide comparable engine performance results (Najafi *et al.*, 2009). As a result, the past decade has seen a tremendous increase in research related to ethanol production from feed stocks such as corn stover, switch grass, rice hulls, wheat straw, landscape waste, paper processing waste, food processing waste, and sugarcane waste. A wide variety of cellulose-based biomass wastes and byproducts are available for conversion to biofuels. These include:

- Agricultural residues (corn stalks and cobs, straws, cotton gin trash, palm oil wastes, etc.)
- Paper (paper mill sludge, recycled newspaper, sorted municipal solid waste, etc.)
- Wood waste (sawdust, woodchips, pruning, etc.)
- Landscape waste (leaves, grass clippings, vegetable and fruit wastes, etc.)
- Most of these materials are available at very low cost, and some even command tipping fees associated with their disposal as wastes (Naderi *et al.*, 2013).

Research Article

Bagasse is the residue fiber remaining when sugar cane is pressed to extract the sugar. Some bagasse is burned to supply heat to the sugar refining operation; some is returned to the fields; some finds its way into various panel products. Bagasse is composed of fiber and pith. The fiber is thick walled and relatively long (1 to 4 mm). It is obtained from the rind and fibrovascular bundles dispersed throughout the interior of the stalk. The chemical composition of bagasse as follows: 52.42% cellulose, 21.69% lignin, 73.92% holocellulose, 45.3% α -cellulose, 2.73% ash and, 1.66% ethanol/dichloromethane extractable, on an oven dry weight basis. In spite of the many studies in other non-woods organosolv pulping, so far, limited research has been conducted on the pulping of bagasse by organic solvents. Organosolv processes have been applied with varying success to hard and soft wood and also, to a lesser extent, to non-wood materials (Akbari and Hussein, 2012 Quoted from Atchison 1998 and Peng & Simonson, 1992).

MATERIALS AND METHODS

The population of this study included staff of agro-industries. The total number of members was 1233 person. The sample size was obtained through a simple random sampling. The sample size according to the Krejcie & Morgan table was 291 (n=291). Questionnaire reliability was estimated by calculating Cronbach's alpha and it was appropriate for this study. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). To reach the research objectives, appropriate statistical procedures for description were used. Data analysis was carried out through data description and data inferential analysis.

A five-point Likert-type scale was used as the instrument to gather data in order to measure attitude of agro-industries staff toward cane waste management.

RESULTS AND DISCUSSION

Results

Demographic Profile

Table 1 shows the demographic profile and the descriptive statistics for some characteristics of the staff of agro-industries. The results of the demographic information of the participant staff of agro-industries indicated that the age of 61.5% of staff was between 33-41 years. The minimum age of participant was 24 years and the maximum age was 48 years. Based on educational levels, a greater proportion (48.5%) of them had MSc educational level. Based on the income, 44% of them had 16-21 million rial in month.

Table 1: Demographic profile of staff of agro-industries

variables	Frequency	Percentage	Cumulative Percentage	
Age				
24-32	30	10.3	10.3	Mean=38.5 Sd= 4.55 Min=24 Max=48
33-41	179	61.5	71.8	
42-48	71	24.4	96.2	
No answer	11	3.8	100	
Educational level				
Diploma and lower	98	35.4	35.4	
Technician	18	6.2	41.6	
BSc	141	48.5	90.1	
MSc and upper	25	8.6	100	
No answer	4	1.3		
Income (Million Rials)				
10-15.9	89	30.6	30.6	Mean=19.9 Sd=5.144
16-21.9	129	44	74.6	
22-27.9	52	17.8	92.4	
28-34	18	6.2	98.6	
No answer	4	1.4	100	

Research Article

Attitude toward Cane Waste Management in Agro-Industries

In this study, for analyzing attitude of staff, the Likert scale was used. The ratings on the Likert scale were from one to five (1. Strongly Disagree, 2. Disagree, 3. No opinion, 4. Agree, 5. Strongly agree). The final computed score represented the overall level of attitude. The Table 2 revealed the answer of staff to each item of attitude toward cane waste management in agro-industries and Table 3 identified the level of overall attitude toward cane waste management in agro-industries after computing 10 items of attitude.

Table 2: Frequency of staff to each item of attitude toward cane waste management in agro-industries

Items	1	2	3	4	5	Mea n	sd	cv
A change in cultural method can lead to a reduction in waste.	50	146	59	28	6	2.28	0.933	0.409
Three weeks off water of farms, to harvest is enough.	44	106	70	59	6	2.56	1.048	0.409
Lodging and how the withdrawal would be an increase in the amount of waste	179	100	4	4	0	1.41	0.592	0.422
Green harvesting sugarcane increased soil organic matter, and improve soil fertility.	65	154	44	12	12	2.13	0.925	0.466
Waste makes low production efficiency, and not manage it, causing economic losses.	132	135	13	7	2	1.65	0.738	0.447
Farms are lodging is better harvest in day.	117	137	19	16	0	1.77	0.801	0.452
The use of species that occur in less lodging, suited to machine harvest	172	80	15	18	0	1.57	0.855	0.544
If fire and harvest time is less, so the amount of waste to be harvest for less	161	91	11	12	4	1.59	0.867	0.545
Waste management is to increase production efficiency	130	79	32	33	11	2	1.176	0.587
Continuous training for drivers that carrying straw and harvester operators, is effective in reducing waste.	188	93	6	6	6	1.38	0.978	0.410

1. Strongly Disagree, 2. Disagree, 3. No opinion, 4. Agree, 5. Strongly agree

Table 3: Level of overall attitude toward cane waste management in agro-industries

attitude	Frequency	Percent	Cumulative percent
Very low	20	7.19	7.19
Low	37	13.31	20.50
Moderate	117	42.09	62.59
High	66	23.74	86.33
Very high	38	13.67	100.00
Total	278	100.00	

Correlation Study

Spearman correlation coefficients to test hypotheses was used, the results of this test are as follows (Table 4):

The results of table 4 showed the correlation ($r=0.150$) between level of education and attitude toward cane waste management in agro-industries at the level of 0.05 was significant. Therefore, the null hypothesis is rejected. It means that with 95% of confidence, we can conclude that staff with high education level had high attitude.

Research Article

Also the results of table 4 showed, the correlation ($r=0.153$) between technical knowledge and attitude toward cane waste management in agro-industries at 0.05 was significant. Therefore, the null hypothesis is rejected. It means that with 95% of confidence, we can conclude that staff with high educational level had high attitude.

Also the results of table 4 showed, the correlation ($r=0.194$) job satisfaction and attitude toward cane waste management in agro-industries at 0.01 was significant. Therefore, the null hypothesis is rejected. It means that with 99% of confidence, we can conclude that staff with high job satisfaction had high attitude.

The results of table 4 showed, the correlation ($r=0.146$) participation in educational practices and attitude toward cane waste management in agro-industries at 0.01 was significant. Therefore, the null hypothesis is rejected. It means that with 95% of confidence, we can conclude that staff with high participation in educational practices had high attitude.

Table 4: Relationship between attitude toward cane waste management in agro-industries and independent variables

Independent variable	Dependent variable	r	p
Level of education	attitude toward cane	0.150	0.023
Technical knowledge	waste management in	0.153	0.021
Job satisfaction	agro-industries	0.194	0.003
Participation in educational practices		0.146	0.032
Income		0.122	0.066
Quality of education		0.141	0.083
Age		-0.119	0.076

Regression Analysis

Table 5 shows the result for regression analysis by stepwise method. Liner regression was used to predict changes in attitude by different variables. Level of education, technical knowledge, job satisfaction and participation in educational practices may well explain for 49.5% changes ($R^2 = 0.495$) in attitude of staff.
 $Y=11.232+0.230x_1+0.442x_2+0.365x_3+0.235x_4$

Table 5: Multivariate regression analysis

Independent variable	B	Beta	T	Sig
Level of education	0.230	0.276	3.464	0.000
Technical knowledge	0.442	0.162	2.776	0.000
Job satisfaction	0.365	0.157	2.154	0.000
Participation in educational practices	0.235	0.435	2.465	0.000
Constant	11.232	---	4.745	0.000

$R^2=0.495$ $F=5.544$, $Sig= 0.000$

Conclusion and Recommendation

The results of research showed the correlation between level of education, technical knowledge, job satisfaction, participation in educational practices and attitude toward cane waste management in agro-industries was significant. Therefore, we can conclude that farmers with high level of education, technical knowledge, job satisfaction, participation in educational practices had high attitude toward cane waste management in agro-industries. The result of regression analysis by stepwise method indicated level of education, technical knowledge, job satisfaction and participation in educational practices may well explain for 49.5% changes ($R^2 = 0.495$) in attitude of staff.

Therefore, to development of the attitude of staff toward cane waste management in agro-industries, considering variables of level of education, technical knowledge, job satisfaction, and participation in educational practices are essential. This should be considered by agro-industry managers and planners.

Research Article

ACKNOWLEDGMENT

This paper is part of MSc thesis of Feizollah Malekmohammadi graduate student of agricultural management department, Shoushtar branch, Islamic Azad University. Thus, appreciate of professors and lectures of agricultural management department.

REFERENCES

- Akbari M and Resalati H (2012).** Use of agricultural waste in the pulp and paper industry. *The 1th International and The 4th National Congress on Recycling of Organic Waste in Agriculture* 26 – 27 April 2012 in Isfahan, Iran.
- Asadi Ali, Akbari Morteza, Mohammadi Yaser and Hossainia Golam Hossein (2010).** Agricultural Wheat Waste Management in Iran. *Australian Journal of Basic & Applied Sciences* 4(3) 421-428.
- Atchison JE (1995).** Twenty _five years of global progress in non-wood plant fiber pulping Historical highlights present status, and future prospects. *Conference Atlanta: TAPPI press* 97.
- Naderi P, Naderi M and Najafi N (2013).** An Analysis over Challenges and Feasibility of Cellulosic Bio-fuels in IRAN and over the World. *Journal of Basic and Applied Scientific Research* 3(2s) 371-374.
- Najafi Gh, Ghobadian B, Tavakoli T and Yusaf TF (2009).** Potential of bioethanol production from agricultural wastes in Iran. *Renewable and Sustainable Energy Reviews* 13(6-7) 1418-1427.
- Peng F and Simonson R (1992).** High-yield chemimechanical pulping of bagasse, Part 4, Baggase CMP with sodium hydroxide/hydrogen peroxide pretreatment. *Appita Journal* 45(2) 104–108.
- Sabiiti EN (2011).** Utilizing Agricultural Waste To Enhance Food Security And Conserve The Environment. *African Scholarly Science Communication Trust* 11(6) 1-9.
- Sabiiti EN, Bareeba F, Spordly E, Tenywa JS, Ledin S, Ottabong E, Kyamanywa S, Ekbohm B, Mugisha J and Drake L (2005).** Urban market garbage: A resource for sustainable crop/livestock production system and the environment in Uganda. A paper presented at the *International Conference, Wastes-The Social Context, Edmonton, Canada.*