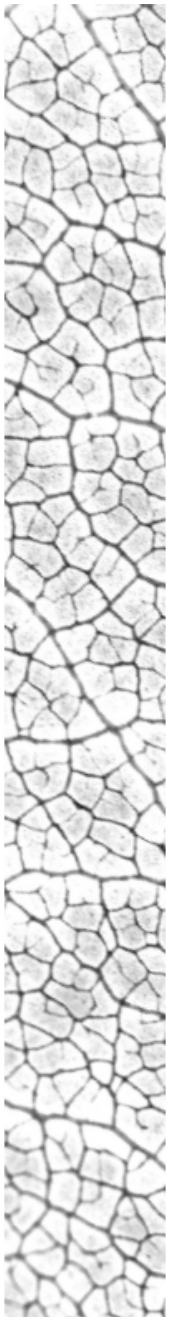

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Studying effective factors on executing and applying biogas energy from viewpoint of experts of Ministry of Agriculture of Iran

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Abstract
Meeting energy requirements in rural and deprived areas is one of the most fundamental problems of all countries of world specially developing countries and even in a country like Iran that has enriched resources of energy, meeting this energy is very problematic and expensive; thus, the most appropriate solution for this problem is applying renewable energies including: Biogas. The present research from viewpoint of type of research is classified as applied research and from viewpoint of method is classified as descriptive-correlation research. Statistical society of this relation is 150 experts of Ministry of Agriculture that are working in relation to biomass energy and sampling method is based on census. In the way of politicizing effective economic factors for application of biomass is a budget is anticipated for advertisement and introducing biomass energy, prioritizing social factors, good and effective communication with other similar companies, prioritizing of educational factors, holding related exhibitions for native biogas energy, prioritizing of managerial factors, increasing awareness of directors from advantages of biomass energy, prioritizing factors facilitating trust of policy makers for executing biomass energy plans. Studying Spearman correlation for 2 variables of level of awareness and recognition of people shows that there is positive-significant relationship between aforesaid 2 variables. Moreover, results of simple regression shows that the variable of policy making factor nearly 32%, economic factor nearly 32%, social factor nearly 45%, educational factor nearly 33%, managerial factor nearly 25%, facilitating factor nearly 27%, impediments and limitations for application of biomass energy nearly 33% describes the changes of dependent variable to application of biomass energy.

Keywords: effective mechanism, application, biogas, Ministry of Agriculture

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INTRODUCTION

Agricultural sector like other productive and economic sectors requires energy consumption in different forms and food safety is one of the most important plans of policy makers. Biomass is one of the most important resources of renewable energies that consists of jungles, elements of plants, leafs, living creatures, oceans, animal feces, urban and food wastes that are regarded as good economic substitutes for fossil fuels; nevertheless, replacement of fossil fuels and traditional fuels with renewable resources by the farmers requires to be introduced and recognized by target society (Zhao and Guo 2015). In case of considering biogas energy technology as an innovation, promoting its requires to increase knowledge and information of users, changing and amending attitudes of farmers and managers; thus, one of the most important duties of agricultural experts is educating method of managing consumption of energy resources and improving application of new energies by the farmers (Mohammadi and Sabouri 2016). According to the recent estimation of Ministry of Agriculture in Iran, volume of wastes of agricultural crops is announced as 18.85; thus, in compliance with role of agricultural sector for domestic gross production, reducing level of waste materials may play key role for obtaining foreign currency in agricultural sector (Taghavi and Abbaspour 2013, Tel et al. 2018). Whereas 31,5% of population of Iran are living in rural areas and in compliance with undeniable role of villages for obtaining to national development (Adeli, Gilani and Souri 2010); thus, meeting energy through different

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Table 1. Potential for annual production of biomass and biogas in Iran

Resources of Biomass	Production Unit	Annual Production Rate	Potential for Production of Biogas (M^3)
Animal feces	Thousand ton	47946	8668
Urban sewage system	Thousand ton	25176	108-245
Industrial sewage system	Thousand ton	36245	82-280
Agricultural wastes	Thousand ton	23147	5475
Urban wastes	Thousand ton	13870	1646

Table 2. Results of Cronbach's alpha coefficient

Different sections of questionnaire	No of items	Cronbach's alpha
Policy making factor	11	0.83
Economic factor	12	0.86
Social factor	11	0.85
Educational factor	8	0.80
Managerial factor	8	0.89
Facilitating factor	14	0.86
Impediments of using biogas	18	0.87
	12	
	11	

methods is necessary for prevention of excess immigration. Biogas is regarded as a simple method for controlling environment pollutions, preparing healthy fertilizer, producing environmental friendly and reasonable price fuel. In deprived villages of Iran the necessity of using biogas for supplying energy was determined since many years ago and after paying subsidy by the government, using biogas in deprived areas is logical and cost-effective (Azarikia and Ashjari 2013; Lopatkova et al, 2018). Biogas may be produced through fermentation of 3 species of biomass including: A) Animal feces and agricultural wastes B) Urban and industrial sewage system 3) Urban wastes. By using results of study for measuring potentials of producing biogas in Iran the following conclusion is obtained: There is 74964 thousand ton animal feces available in Iran annually; that is able to produce 8668 million m3 biogas from these feces, the mass of agricultural and jungle wastes is annually 23147,5 thousand ton that is able to produce 5475,8 million m^3 biogas and the biogas obtained from industrial sewage system is very variable and depends on type of industry, type of purification process and amount of sewage system (Adl 1999). It is estimated to produce annually 279,4 million m^3 biogas from food industries including: vegetable oil, alcoholic drinks, can foods, Compote and fish and by using available technology, annually 7 m3 biogas is produced from place of burial of wastes that in comparison to theoretical return of producing biogas, this amount is very low. Thus, extracting oil in this condition in very large cities is cost-effective; nevertheless, through benefiting Anaerobic digestion of corruptive wastes, the sum of produced biogas in Iran (by assuming 60% efficiency of process) is 16457 million m3 biogas annually in (**Table 1**).

Economic outcomes of biogas are including: Making income through selling energy (biogas, electricity and heat), organic fertilizer and water for being used in agriculture, developing green space, purifying solid wastes and reducing costs during long-term (reducing costs of water and soil pollution), optimization of soil, productivity of agriculture due to using organic fertilizer obtained from biogas power plants, long-term effects for amending structure and fertility of soil, extracting recyclable materials with organic wastes (glass, metal, paper and plastic) and selling them to recycling industries, prevention of spending large amount of foreign currency in compliance with production of organic fertilizer for reduction of using chemical fertilizer, reduction of demand for pesticides and weeds, reduction of demand for fossil fuels (Alavi et al. 2013, Ghardashi et al. 2001). Limoei and Mohabatkar (2017) through studying the environmental effects of biogas stated that using biogas in addition to obtaining healthy environment and preparing enriched fertilizer and producing fuel gas; is also very important from economic point of view. Moreover, results showed that according to a natural process, biogas is produced without spending any specific cost; nevertheless, controlling and operation of biogas depends on spending cost. Vebergan et al. (2010) studied impediments, capacity and costs of using renewable energies, concluded that lack of attention to technical factors and marketing are regarded as impediment for developing renewable energies. Karkino et al. (2015) believed that increasing fuel from viewpoint of farmers is very effective for encouraging farmers to more use from renewable energies like: solar energy as replacement energy for drip irrigation system of farms.

METHOD

The present research is regarded as applied research and its methodology is descriptive-correlation. The stages of theoretical studies and qualitative research was performed with documentary method and for quantitative stages, it was performed with field method by using questionnaire. Statistical society of this research is 150 experts of Ministry of Agriculture that are operating in the field of biomass energy and the sampling method is based on census in (**Table 2**).

FINDINGS

Individual Properties of Agricultural Experts

Distributing frequency of experts shows that average age of experts is 39 years with standard deviation of 6.35 and results of this table shows that majority of experts i.e. 31.7% (57 experts) are classified within age of 41 to 45 years. Distributing frequency of experts shows that 82.8% (105 persons) of experts are male and 17.3% (22 experts) are female. Distributing frequency for record of activity of experts in relation to biomass energy shows that 54.4% of experts have the highest frequency and

Table 3. Prioritizing Viewpoint of Experts for Influence of Policy Making factor for Executing and Application of Biomass Energy

Policy Making Factor	Average	Standard Deviation	Change Coefficient	Rank
Compatibility of policies of government with goals for developing biomass energy	3.94	1.03	26.14	1
Application of experts in relation to biomass energy	4.08	1.20	29.41	2
Planning for justification of superior managers and authorities for developing biogas industry	3.99	1.17	30.00	3
Selecting policy of using waste materials and recycling industry in Iran	4.01	1.24	30.92	4
Enacting rules and regulations for biomass energy	3.80	1.21	31.84	5
Selecting complied policy and application of private sector	3.94	1.26	31.98	6
Enacting encouragement policy for executors of biomass energy	3.60	1.21	33.61	7
Encouraging government for prioritizing agricultural sector for executing biogas energy plan	3.54	1.24	35.03	8
Customs exemptions for developing biomass energy	3.52	1.25	35.51	9
Policy for investment in relation to biomass energy	3.63	1.31	36.09	10
Reducing tax for activation of biomass energy activities	3.45	1.40	40.58	11

Very Low: 1 Low: 2 Medium: 3 High: 4 Very High: 5

Table 4. Prioritizing Viewpoint of Experts in relation to influence of Economic factors for Executing and Application of Biomass Energy

Policy Making Factor	Average	Standard Deviation	Change Coefficient	Rank
Budget for advertisement and introducing biomass energy	4.09	1.07	26.16	1
Having access to required materials for industry of biomass energy	3.81	1.02	26.77	2
Level of satisfaction of income obtained from biomass energy	3.92	1.05	26.79	3
Having access to low-interest loans for executing biomass energy	3.77	1.05	27.85	4
Level of financial saving and capital of applicants for developing biomass energy	4.10	1.16	28.29	5
Application for small industry products and biomass energy	3.88	1.12	28.87	6
Investment for buying new technology and equipment	3.67	1.08	29.43	7
Investment for research and development of biomass energy	3.62	1.07	29.56	8
Recognizing new markets and improving marketing capacity	3.56	1.08	30.34	9
Offering financial support and investment by government	3.58	1.12	31.28	10
Developing required infrastructures for developing biomass energy	3.52	1.20	34.09	11
Investment for employment and education of technical experts	3.70	1.29	34.86	12

Very Low: 1 Low: 2 Medium: 3 High: 4 Very High: 5

record of activity between 6 to 10 years. Distributing frequency for type of activity of experts in the field of biomass energy shows that 24.8% of respondents have the highest frequency in relation to jungles wastes. 20.8% of experts are active in the field of agricultural products and wastes, gardening and food industry, 20.8% of experts in the field of urban and industrial sewage system, 12% of experts in the field of animal feces, 11.2% of experts in the field of solid urban wastes and 10.45 of experts in the field of sewage system and industrial organic wastes. Comment of experts in relation to level of awareness and recognition of people from advantages of biomass shows that 37.9% of experts with highest frequency of level of awareness and recognition of people from goals and advantages of biomass energy have evaluated at “low” and “very low” level. Comment of experts in relation to suitable attitude of people for using biomass energy shows that 38.7% of experts believed that suitable attitude of people toward using biomass energy is estimated at Medium level.

Prioritizing Policy Making Factors for Executing and Application of Biomass Energy

Prioritizing items related to influence of policy making for executing and application of biomass energy in (**Table 3**) shows that by sequence of priority; Compatibility of policies of government with goals of developing biomass energy, application of experts in biomass energy, planning for attracting attention of superior managers for developing biogas energy, using policy of wastes and recyclable industry in Iran, enacting rules and regulations for biomass energy, selecting compiled policy for presence of private sector with minimum change coefficient are regarded as most important policy making factors for executing and application of biomass energy. Reducing tax for biomass energy activities with maximum change coefficient is regarded as final priority.

Prioritizing Economic Factors for Executing and Application of Biomass

Prioritizing items related to economic factors for executing and application of biomass in compliance with (**Table 4**) shows that following factors are available in compliance with sequence of priority: Budget for advertisement and introducing biomass energy, having access to raw materials required for biomass, level of satisfaction of income obtained from biomass energy, having access to low-interest loans for executing biomass energy, level of capital and financial saving for applicants for improving biomass energy with lowest coefficient of changes are among the most important policy making factors for executing and application of biomass energy. Moreover, investment in the field of employment and education of technical experts with maximum coefficient of changes is regarded as final priority.

Prioritizing Social Factors for Executing and Application of Biomass

Prioritizing items related to social factors for executing and application of biomass in compliance with (**Table 5**) shows that following factors are available in compliance with sequence of priority: Effective and good communication with other similar companies, attention

Table 5. Prioritizing Viewpoint of Experts in relation to Influence of Social factors for Executing and Application of Biomass Energy

Policy Making Factor	Average	Standard Deviation	Change Coefficient	Rank
Effective and good communication with other similar companies,	3.81	0.90	23.62	1
attention to employment opportunity	3.65	0.98	26.8	2
increasing education among applicants of biomass, cooperation with private sector and creating cooperation network for biomass	4.00	1.10	27.50	3
cooperation with private sector and creating cooperation network for biomass	3.86	1.07	27.72	4
increasing cultural level of society	3.99	1.11	27.82	5
Exchanging information and having access to required information for application of biomass energies	3.40	1.00	29.41	6
Having active and effective industrial associations for producing biomass energy	3.82	1.13	29.58	7
Developing teamwork for biomass energies	3.74	1.12	29.95	8
Awareness of society for advantages of biomass energy	3.67	1.13	30.79	9
Using previous experiences of executors of plan for biomass energy	3.49	1.08	30.95	10
Awareness of new marketing for biomass energy	3.60	1.19	33.06	11

Very Low: 1 Low: 2 Medium: 3 High: 4 Very High: 5

Table 6. Prioritizing Viewpoint of Experts in relation to Influence of Educational factors for Executing and Application of Biomass Energy

Policy Making Factor	Average	Standard Deviation	Change Coefficient	Rank
Holding related exhibition for native biogas energy	4.03	1.21	30.02	1
preparing and showing related educational films to biogas	3.93	1.18	30.03	2
holding educational workshop for public people,	3.86	1.20	31.09	3
warning and reflecting news for application of biogas energy in mass media including: radio and television	3.86	1.23	31.87	4
holding educational workshop for experts for improving biogas industry	3.69	1.19	32.25	5

Very Low: 1 Low: 2 Medium: 3 High: 4 Very High: 5

Table 7. Prioritizing Viewpoint of Experts in relation to Influence of Managerial factors for Executing and Application of Biomass Energy

Policy Making Factor	Average	Standard Deviation	Change Coefficient	Rank
Perceiving and awareness of managers from advantages of biomass energy	3.84	1.13	29.43	1
introduction to ICT skills among managers	3.69	1.12	30.35	2
belief, support and obligation of management for using biomass energy projects	3.78	1.15	30.42	3
exact executing labor and social security rules among productive enterprises of biomass energy	3.71	1.14	30.73	4
Using qualified managers in relation to biomass energy	3.87	1.19	30.75	5
Preparing required infrastructures for launching marketing information system	3.75	1.19	31.73	6
Application of modern managerial methods for designing and producing biomass energy	3.66	1.13	30.87	7
supplying expert human workforces for designing and producing biomass energy	3.67	1.26	34.33	8

Very Low: 1 Low: 2 Medium: 3 High: 4 Very High: 5

to employment opportunity, increasing education among applicants of biomass, cooperation with private sector and creating cooperation network for biomass, increasing cultural level of society with lowest change coefficient are regarded as most important social factor for executing and application of biomass. Moreover, awareness of new marketing in relation to biomass energy with maximum coefficient of changes is regarded as final priority.

Prioritizing Educational Factors for Executing and Application of Biomass

Prioritizing items related to educational factors for executing and application of biomass in compliance with (**Table 6**) shows that following factors are available in compliance with sequence of priority: Holding related exhibition for native biogas energy, preparing and showing related educational films to biogas, holding educational workshop for public people, warning and reflecting news for application of biogas energy in mass media including: radio and television, holding educational workshop for experts for improving biogas industry with minimum coefficient of changes are regarded as most important educational factors for application of biomass.

Prioritizing Managerial Factors for Executing and Application of Biomass

Prioritizing items related to managerial factors for executing and application of biomass in compliance with (**Table 7**) shows that following factors are available in compliance with sequence of priority: Perceiving and awareness of managers from advantages of biomass energy, introduction to ICT skills among managers, belief, support and obligation of management for using biomass energy projects, exact executing labor and social security rules among productive enterprises of biomass energy with lowest change coefficient are regarded as most important managerial factor for executing and application of biomass. Moreover, supplying expert human workforces for designing and producing biomass energy with maximum change coefficient is at final priority.

Table 8. Prioritizing Viewpoint of Experts in relation to Influence of Facilitating factors for Executing and Application of Biomass Energy

Policy Making Factor	Average	Standard Deviation	Change Coefficient	Rank
Belief of policy makers in relation to executing biomass plans,	4.03	1.09	27.05	1
increasing economic afford of people	4.09	1.12	27.38	2
developing financial mechanism in relation to biomass energy,	4.10	1.14	27.80	3
policy making by government in relation to improving application of biomass,	4.10	1.15	28.05	4
applying expert workforces in the field of biomass energy	3.89	1.10	28.28	5
ability of installing biogas energy at urban environment	3.96	1.13	28.54	6
partnership of NGO in relation to biomass energy	4.02	1.16	28.86	7
Improving financial management of related organizations with biomass energy	3.91	1.15	29.41	8
Long-term planning in relation to application of biomass energy	3.86	1.14	29.53	9
Developing legal mechanism for biomass energy	3.89	1.15	29.56	10
Awareness of people in relation to advantages of biomass energy	3.98	1.19	29.90	11
Preparing legal frames for executing plan by using biomass energy	3.82	1.19	31.15	12
Developing correct machines of biogas and its popularity in villages	3.86	1.20	31.09	13
Enacting rules and regulations for biomass energy	3.87	1.26	32.56	14

Very Low: 1 Low: 2 Medium: 3 High: 4 Very High: 5

Table 9. Prioritizing Viewpoint of Experts in relation to Influence of Limitation and preventive factors for Executing and Application of Biomass Energy

Policy Making Factor	Average	Standard Deviation	Change Coefficient	Rank
Ignorance of people for method of executing plan by using biomass energy	4.23	1.00	23.64	1
lack of having long-term planning in relation to using biomass energy,	4.05	1.11	27.41	2
enrichment of Iran from viewpoint of oil-gas and fossil fuels,	4.02	1.13	28.11	3
shortage of expert forces in the field of biomass energy	3.99	1.14	28.57	4
poorness of financial management of related organizations with biomass,	3.94	1.15	29.19	5
lack of having economic afford by people	4.04	1.19	29.46	6
lack of determining legal frame for executing plan by using biomass	3.86	1.14	29.53	7
ignorance of people in relation to advantages of using biomass energy	3.83	1.14	29.77	8
Poorness of organizational management of related organizations to biomass energy	3.96	1.23	31.06	9
Lack of having decision making ability in relation to biogas energy	3.91	1.23	31.46	10
Lack of social adoption for using biogas energy	3.69	1.11	31.71	11
Available impurity in produced energy through industry	3.80	1.24	32.63	12
Lack of partnership and establishing NGO for decision making of related organizations to biomass energy	3.77	1.25	33.16	13
Ignorance of government in relation to using biomass energy	3.83	1.28	33.42	14
Non-determine policy of government in relation to application of biogas energy	3.86	1.32	34.20	15
Lack of cooperation of executive managers of Iran for performing biomass energy	3.88	1.33	34.28	16
Lack of having specific reference for biogas project in Iran	3.63	1.30	35.81	17
Inability of installing biogas system in urban environments	3.50	1.34	38.29	18

Very Low: 1 Low: 2 Medium: 3 High: 4 Very High: 5

Prioritizing Facilitating Factors for Executing and Application of Biomass

Prioritizing items related to facilitating factors for executing and application of biomass in compliance with (**Table 8**) shows that following factors are available in compliance with sequence of priority: Belief of policy makers in relation to executing biomass plans, increasing economic afford of people, developing financial mechanism in relation to biomass energy, policy making by government in relation to improving application of biomass, applying expert workforces in the field of biomass energy, ability of installing biogas energy at urban environment and partnership of NGO in relation to biomass energy with minimum change coefficient are regarded as most important facilitating factors for executing and application of biomass. Moreover, preparing rules and regulations related to biomass energy with maximum change coefficient is regarded as final priority.

Prioritizing Limitation and Preventive Factors for Executing and Application of Biomass

Prioritizing items related to limitation and preventive factors for executing and application of biomass in compliance with (**Table 9**) shows that following factors are available in compliance with sequence of priority: Ignorance of people for method of executing plan by using biomass energy, lack of having long-term planning in relation to using biomass energy, enrichment of Iran from viewpoint of oil-gas and fossil fuels, shortage of expert forces in the field of biomass energy, poorness of financial management of related organizations with biomass, lack of having economic afford by people, lack of determining legal frame for executing plan by using biomass, ignorance of people in relation to advantages of using biomass energy are among the most important limitation and preventive factors for application of biomass that by minimum change coefficient is regarded as top priority. Moreover, lack of ability of installing biogas systems at urban environment with maximum change coefficient is regarded as final priority.

Studying spearman correlation coefficient in (**Table 10**) shows that there is positive-significant relationship between 2 variables of level of awareness and recognition of people from goals and advantages of biomass energy and application of biomass energy (r= 0.668 and p= 0.000); thus, the research hypothesis for having relationship is confirmed with 99% certainty and

Table 10. Results of spearman correlation coefficient for studying relationship between awareness and recognition of people from goals and advantages of biomass energy and application of biomass energy

Independent Variable	Dependent Variable	Spearman Coefficient (r)	Sig Level (p)
awareness and recognition of people from goals and advantages of biomass energy	application of biomass energy	0.668	0.000

Table 11. Results of spearman correlation coefficient for studying relationship between suitable attitude of people for using biomass energy and application of biomass energy

Independent Variable	Dependent Variable	Spearman Coefficient (r)	Sig Level (p)
suitable attitude of people for using biomass energy	application of biomass energy	0.590	0.000

Table 12. Results of regression in relation to influence of policy making variable on application of biomass energy

Independent variable	Correlation coefficient R	Determining coefficient R2	Adjusted coefficient R̂2	F	Sig level
Policy making factor	0.576	0.332	0.326	56.61	0.000

Table 13. Results of regression in relation to influence of economic factor on application of biomass energy

Independent variable	Correlation coefficient R	Determining coefficient R2	Adjusted coefficient R̂2	F	Sig level
Economic factor	0.576	0.332	0.326	56.19	0.000

zero hypothesis with maximum error of 1% is rejected i.e. if the level of awareness and recognition of people from goals and advantages of biomass energy is higher, there is higher level of application of biomass energy by people.

Studying spearman correlation coefficient in (**Table 11**) shows that there is positive-significant relationship between 2 variables of level of suitable attitude of people for using biomass energy and application of biomass energy (r= 0.590 and p= 0.000); thus, the research hypothesis for having relationship is confirmed and zero hypothesis with maximum error of 1% is rejected i.e. if the level of suitable attitude of people for using biomass energy is higher, there is higher level of application of biomass energy by people.

In order to estimate the influence of independent variable of policy making factors on application of biomass, it is benefit from regression. Results of calculations in (**Table 12**) shows that variable of policy making factor describes nearly 32% of changes of dependent variable for application of biomass energy.

In order to estimate the influence of independent variable of economic factor on application of biomass, it is benefit from regression. Results of calculations in (**Table 13**) shows that variable of economic factor describes nearly 32% of changes of dependent variable for application of biomass energy.

Table 14. Results of regression in relation to influence of social factor on application of biomass energy

Independent variable	Correlation coefficient R	Determining coefficient R2	Adjusted coefficient R̂2	F	Sig level
Social factor	0.681	0.464	0.459	98.60	0.000

Table 15. Results of regression in relation to influence of educational factor on application of biomass energy

Independent variable	Correlation coefficient R	Determining coefficient R2	Adjusted coefficient R̂2	F	Sig level
Educational factor	0.582	0.336	0.330	57.74	0.000

Table 16. Results of regression in relation to influence of managerial factor on application of biomass energy

Independent variable	Correlation coefficient R	Determining coefficient R2	Adjusted coefficient R̂2	F	Sig level
Managerial factor	0.511	0.261	0.255	40.27	0.000

Table 17. Results of regression in relation to influence of facilitating factor on application of biomass energy

Independent variable	Correlation coefficient R	Determining coefficient R2	Adjusted coefficient R̂2	F	Sig level
Facilitating factor	0.532	0.283	0.276	44.90	0.000

In order to estimate the influence of independent variable of social factor on application of biomass, it is benefit from regression. Results of calculations in (**Table 14**) shows that variable of social factor describes nearly 45% of changes of dependent variable for application of biomass energy.

In order to estimate the influence of independent variable of educational factor on application of biomass, it is benefit from regression. Results of calculations in (**Table 15**) shows that variable of educational factor describes nearly 33% of changes of dependent variable for application of biomass energy.

In order to estimate the influence of independent variable of managerial factor on application of biomass, it is benefit from regression. Results of calculations in (**Table 16**) shows that variable of managerial factor describes nearly 25% of changes of dependent variable for application of biomass energy.

In order to estimate the influence of independent variable of facilitating factor on application of biomass, it is benefit from regression. Results of calculations in (**Table 17**) shows that variable of facilitating factor describes nearly 33% of changes of facilitating factor for application of biomass energy.

In order to estimate the influence of independent variable of limitation and impediments on application of biomass, it is benefit from regression. Results of calculations in (**Table 18**) shows that variable of limitation and impediments describes nearly 33% of changes of dependent variable for application of biomass energy.

Table 18. Results of regression in relation to influence of limitation and impediments on application of biomass

Independent variable	Correlation coefficient R	Determining coefficient R2	Adjusted coefficient R̂2	F	Sig level
limitation and impediments	0.583	0.340	0.334	58.60	0.000

CONCLUSION

Studying correlation coefficient between 2 variables of awareness and recognition of people from goals and advantages of biomass energy and application of biomass energy showed that aforesaid 2 variables have positive-significant relation at level of 1% error i.e. if level of awareness and recognition of people in relation to goals and advantages of biomass energy is higher; the application of biomass energy may be higher too. Results of correlation coefficient between 2 variables of suitable attitude of people toward biomass energy and application of biomass energy showed that there is positive-significant relation at level of 1% error i.e. in case of having higher attitude of people toward biomass energy; the level of application of biomass energy is higher too. Results of simple regression showed that variable of policy making 32%, economic factor 32%, social factor 45%, educational factor 33%, managerial factor 25%, facilitating factor 27% and preventive factor 33% is effective on application of biomass energy i.e. policy making factor describes 32% changes of dependent variable for application of biomass energy. Taghavi and Abbaspour (2013) through studying the status of renewable energies in Iran and world, have coped with producing energy from biomass (biogas) obtained from agricultural waste materials and concluded that mass of agricultural and jungle wastes in Iran is annually 23147.5 ton and producing energy like: bioethanol is regarded as effective economic solution for optimum application of agricultural wastes. Shahinfar and et al 2010 in their study, examined the production of electricity by using biomass and concluded that using biomass as elementary fuel like: rice husk, cotton waste, and animal fertilizer is more cost-effective. Mohammadi and Sabouri (2015) through studying the impediments for application of renewable energies in agricultural sector of Iran and influence of different factors concluded that factors including: impediments of related technologies, economic and social impediments may directly and educational impediments and rules may indirectly influence on application of renewable energies. Martin and Rik (2012) in his study under title of renewable energies in Queensland, Australia concluded that factors including: investment, commercial impediments, impediments related to rules, impediments of technology, information and educational affairs may have negative influence on developing renewable energies. There are 3 important factors for adopting renewable energies including: Firstly, Focusing on relative advantage of such technology; secondly, preparing economic opportunity for financing projects; thirdly, coping with social aspects related to application of modern technologies by adopters (Eder et al. 2015). Developing and native application of renewable energies is faced with some impediments including: Social and economic problems and environmental factors (Tigabue et al. 2015).

RECOMMENDATION

- Results of research showed that level of awareness and recognition of people from goals and advantages of biomass energy is low; thus, it is recommended to hold more educational workshops and courses for informing in relation to goals and advantages of biomass energy
- Compatibility for policies of government with goals for development of biomass energy
- Employing experts in relation to biomass energy at different departments of Ministry of Agriculture
- Easy access of biomass energy industry to required raw materials
- Having access to economic problems and satisfaction of people from making income from biomass energy
- Easy access to low-interest loan for executing biomass project
- Holding related exhibitions related to native application of biogas energy
- Improving perceive and knowledge of managers from advantages of biomass energy
- Being familiar with ICT skills among managers is very important issue

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