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# Searching on a Model for Sustainable Agricultural Higher Education Center (SAHEC)

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**Abstract**

This research has used a mixed methodology with both quantitative and qualitative approaches. The study population included three groups; the post-graduate students, professors and academic staff at two universities, Khouzestan Ramin Agriculture and Natural Resources University and Bu-Ali Sina University. For collecting quantitative data among 320 students, 175 were selected using random sampling and based on the Morgan table. In order to collect qualitative data, 41 professors and academic staff of the two universities were selected based on a criterion purposeful sampling. Gathering tool in quantitative part was a questionnaire including three-parts. The questionnaire's reliability was tested by Cronbach's Alpha technique and the total mean reliability of scales was 84% (α=0.84). For collecting qualitative data, semi-structured interviews were used. A summarized content analysis was used in order to analyze the interviews' data. Quantitative data analysis was conducted in two parts: descriptive and analytical. Results showed that a sustainable agricultural higher education needs a series of factors, characteristics and conditions. These factors at economic, social, cultural, and environmental dimensions include: financial and credit, employment and entrepreneurship, the agricultural productivity, social issues, building culture, and environmental awareness. Results also indicated that a sustainable university should address four elements of education, research, management and planning, and outreach programs in a pool of two-way communication between these elements and the real needs of society and environment.

***Keywords:***
***Sustainable Higher Education, Sustainable Development, Sustainable University, Sustainability, Agricultural Higher Education***

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## INTRODUCTION

Sustainable development has been defined as the development of the current generation to provide benefits and does not harm the interests of posterity, a development that is socially equitable, economically justified and environmentally favorable (Malekmohammadi, 1999). Education is critical for promoting sustainable development and improving the people's capacity in order to address environmental issues. The United Nations has declared 2005-2014 as the Decade of Education for Sustainable Development, with a vision to give everyone the opportunity to learn the values, behaviors, and lifestyles required to a sustainable future. The need to incorporate sustainability into educational programs at all stages of the education chain, from kindergarten to university, has been understood for many years (Corcoran and Wals, 2004; Jones *et al.,* 2008). It is clear the tertiary sector has a potentially very important role in developing sustainability-literate citizens. Furthermore, it is recognized that investment in environmentally orientated universities and their graduates is necessary to achieve the effective implementation of the range of environmental policies (Giacomelli *et al.,* 2003).Therefore, development of a sustainable system of higher education as one of the country's infrastructure development is important. Despite all the success and considering the condition of agricultural higher education must acknowledge that we have faced numerous challenges and bottlenecks. Agriculture in the area of higher education must be transformed into a dynamic and stable (Varmazyari *et al.*, 2009).

While the higher education is the main focus of economic, political, social and cultural development of each country, it should be studied and investigated from various aspects in order to achieve the intended goals (Khajeshahkoohi and Sahne, 2009).One of these important aspects is sustainability or sustainable development. In general the link between the higher education and sustainable development at least in our country is a very new at the same time controversial topic. In this view it is expected that on one hand universities will address the future economic and social needs and on the other hand play a vital role both in addressing educational needs and promoting cultural and moral values in society (Ghorbani Sheikhneshin, 2011). Maybe for this reason in recent years special importance has been taken into attention to the issues such as green education, sustainable higher education, sustainable university and integration sustainability in the universities (Corcoran and Wals, 2004). In general the integration model of sustainability and sustainable development issues into university programs has been begun from 1990s around the world increasingly and extensively. In this line, most of higher education institutions for implementing and the developing the literature of sustainability and green education activities special operations and measures have been done or different statements have been issues through attention to environmental issues, curriculum planning, research, establishing relations with the governmental, non-governmental and private sectors sectors (Bartlett and Chase, 2004; Waas *et al.,* 2010; Wright, 2004).

During the last decade an increasing number of higher education institutions (HEIs) have been engaged in incorporating and institutionalizing sustainable development (SD) into their curricula, research, operations, outreach, and assessment and reporting (Cortese, 2003; Calder and Clugston, 2003; Lozano-Ros, 2003). In spite of a number of efforts by HEIs (Boks and Diehl, 2006; Wemmenhove, and de Groot, 2001), SD is still an innovative idea in most universities (Lozano, 2006), and has not yet permeated into all disciplines, scholars, and university managers (Fien, 2002), or throughout the curricula (Matten and Moon, 2004). According to Lozano (2010), although universities have been major agents of social change for centuries, yet themselves remaining traditional (Elton, 2003). This is evidenced by modern curricula with a primary focus on the conquest of nature and the industrialization of the planet, producing unbalanced, over-specialized, and mono-disciplinary graduates (Cortese, 2003; van Weenen, 2000).

The contribution of universities to sustainability is increasingly being expressed through the publication and adoption of various strategies and declarations at international, regional and University level. Beyond integrating sustainability into the University's internal activities

Table 1: Distribution of students according to demographic characteristics.

| Variable | Items | Frequency | Valid Percent |
|---|---|---|---|
| Gender | Female | 92 | 53 |
| | Male | 82 | 47 |
| | Total | 174 | 100 |
| Educational level | M.Sc. | 136 | 78.3 |
| | Ph.D. | 37 | 21.7 |
| | Total | 173 | 100 |
| Academic field | Extension & education | 29 | 16.7 |
| | Agronomy | 26 | 14.9 |
| | Horticulture | 24 | 13.8 |
| | Plant Protection | 46 | 26.4 |
| | Irrigation | 19 | 10.9 |
| | Soil Science | 28 | 16.1 |
| | Total | 174 | 100 |

(curriculum, research, operations, etc.), the challenge seems to be integrating the University with the sustainable development paths of society (Ferrer-Balas *et al.,* 2009). Over the past years, many universities have integrated sustainability into their education, research, outreach, and operations. Within education, competences regarding sustainable development (SD) have been defined, courses on sustainability have been developed, and manuals and methods for teaching SD have been developed and integrated in curricula (Lambrechts *et al.,* 2013).

According to Lozano *et al.,* (2013), most higher education institutions (HEIs) continue to be traditional, and rely upon reductionist and mechanistic paradigms. As a result many universities are still lagging behind companies in helping societies become more sustainable. In-

Table 2: Factor affecting sustainability in agricultural higher education.

| Rank | Variables | Mean | SD |
|---|---|---|---|
| 1 | Eliminate the gap between the academic and administrative departments | 3.95 | 1.27 |
| 2 | Enough and new educational facilities and equipments | 3.90 | 1.23 |
| 3 | Sufficient number of professors to students' ratio | 3.89 | 1.01 |
| 4 | development of post-graduate's programs in the field of agriculture | 3.87 | 1.01 |
| 5 | Maintain and strengthen information and communication infrastructure | 3.86 | 1.18 |
| 6 | Participatory curriculum development about agriculture | 3.85 | 1.09 |
| 7 | Balance between the real needs of the labor market and agriculture higher education | 3.84 | 1.29 |
| 8 | Financial supports of vocational agriculture programs | 3.82 | 1.27 |
| 9 | the University joint research with agricultural administrative departments | 3.78 | 1.27 |
| 10 | Culturalization and need for sustainable higher education in agriculture | 3.77 | 1.16 |
| 11 | Conduct workshops on sustainable higher education for students and professors | 3.73 | 1.17 |
| 12 | Emphasis on active and cooperative learning techniques instead of traditional and passive methods | 3.72 | 1.30 |
| 13 | Development of entrepreneurship education in the field of agriculture | 3.70 | 1.11 |
| 14 | Supporting agricultural research | 3.69 | 1.25 |
| 15 | Diversification in selecting agricultural curricula | 3.68 | 1.19 |
| 16 | Attention to economic, social and environment aspects of academic programs | 3.66 | 1.14 |
| 17 | A close working relationship between environment-related organizations and universities | 3.65 | 1.15 |
| 18 | Developing a comprehensive monitoring and evaluation system on agricultural higher education | 3.64 | 1.06 |
| 19 | Protect environmental programs and activities in universities | 3.63 | 1.11 |
| 20 | Create a comprehensive and efficient system of agricultural information | 3.62 | 1.07 |
| 21 | Support and development of businesses especial for agricultural graduates | 3.60 | 1.17 |
| 22 | make available incentives for the application of sustainable development practices in the field of agriculture | 3.59 | 1.20 |
| 23 | Integrate academic courses on environmental protection in all areas of agriculture | 3.56 | 1.08 |
| 24 | Financial support of economic and social associations and organizations | 3.48 | 1.11 |
| 25 | Balance between male and female students for agriculture careers | 3.35 | 1.14 |
| 26 | Development of virtual and e-learning education | 3.05 | 0.99 |

Note: very low=1, low=2, moderate=3, high=4, very high=5; SD=Standard Deviation

corporating sustainability into a university system presents challenges regarding its education, research, operations and outreach dimensions (Cortese, 2003; Velazquez *et al.,* 2006). It also creates opportunities for higher education institutions to implement effective assessment and reporting systems to track their progress in incorporating sustainability concepts and approaches throughout their systems (Alibeygi and Ghambarali, 2011; Irvani *et al.,* 2007). According to Ferrer-Balas *et al*. (2010), educators will be better able to identify and work with leverage points throughout the system to better incorporate sustainability into the everyday activities, policies and culture of all universities. Discussion on the higher education SD initiatives, five elements should be incorporated into the university system: (1) fostering university collaboration; (2) promoting transdisciplinarity; (3) implementing SD through campus experiences, by incorporating SD into the day-to-day activities in the university life experience; (4) 'educating-the- educators' on how to educate their students in SD; and (5) including SD in the institutional framework.

As stated earlier, SD is still a relatively new, innovative idea in most universities; the process of incorporation and diffusion of SD within them can be a controversial matter. For the universities that have already incorporated SD in their systems, the following recommendations could help them improve their SD process: 1) It is imperative that the three main stakeholders in the universities (academic personnel, professors, students) understand the importance of SD in the modern world and take action to incorporate it in their institution; 2) Establish a high level SD coordinator position which is empowered and funded to ensure SD continuity; 3) Verify that SD is included in the five dimensions (curricula, research, campus operations, outreach, and assessment and reporting);4) Perform thorough and regular assessment on where your university stands on the five dimensions and compare with your plan's goals; 4) Plan and implement regular reporting of campus SD achievements (Lozano, 2006).

Sustainability has become an increasingly important part of organizations and enterprises. There are governmental regulations, policies, and global market factors that require organizations to consider sustainability as an integral part of their business strategy. A core aspect of sustainability is the dynamic evolution of its meaning and methods of seeking to make progress in achieving it (Govindan, 2013). Responses concerning the best way to overcome barriers to embedding SD in the curriculum support a multidimensional approach, and one that enables interaction with the SD agenda on many levels. This supports the need for a more holistic approach to learning in higher education. SD is not about squeezing in more subject content or making space in curricula for a seemingly irrel-

Table 3: barriers of integrating sustainability into agricultural higher education.

| Rank | Barriers | Mean | SD |
|---|---|---|---|
| 1 | Employment problems of agricultural students and graduates | 4.13 | 0.99 |
| 2 | Lack of effective linkages between the farmers, agricultural higher education and other administrations | 4.12 | 0.94 |
| 3 | Lack of job opportunities for agricultural graduates | 4.09 | 1.07 |
| 4 | The lack of a stable structure for sustainable higher education | 4.07 | 0.82 |
| 5 | Lack of adequate understanding on sustainable higher education | 4.05 | 0.86 |
| 6 | Lack of attention to social and economic role of agriculture | 4.02 | 0.96 |
| 7 | Lack of authorities' attention to sustainable higher education programs | 4.01 | 0.88 |
| 8 | Lack of practical education and training | 3.98 | 1.06 |
| 9 | Lack of appropriate training methods | 3.87 | 0.91 |
| 10 | Inattention to create and develop students' associations and groups especial about sustainable development issues | 3.71 | 0.96 |
| 11 | Independency of agricultural higher education institutions in the educational planning | 3.67 | 1.19 |
| 12 | Lack of student awareness to environmental issues | 3.56 | 1.03 |
| 13 | Inclusion of courses on lack of integration of environmental protection issues into university programs | 3.55 | 1.10 |
| 14 | Enroll more urban students in the agricultural colleges | 3.21 | 1.17 |

Note: very low=1, low=2, moderate=3, high=4, very high=5; SD=Standard Deviation

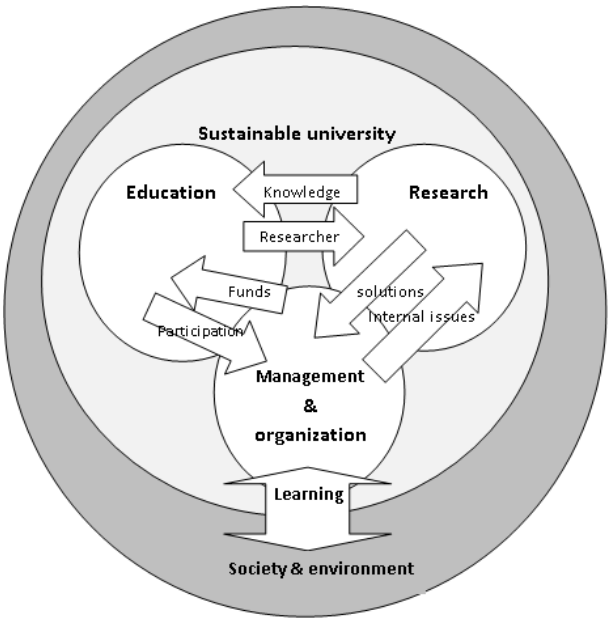


Figure 1: components of a sustainable university (source: Ferrer-Balas *et al.,* 2009)

evant topic in order to satisfy course requirements. If holistic and interdisciplinary perspectives are embraced, the justification for embedding SD into curricula becomes no longer necessary. The relevance of enabling all graduates to grapple with the challenges of creating a sustainable approach in the world of the future is clear (Jones, *et al.,* 2008). Ferrer-Balas *et al*. (2009) have drawn a three interrelated components for a sustainable university which best fits to this research. As seen in fig.1 three elements of education, research, management and organization need to be interrelated for a sustainable university. Therefore, the study's aim was to identify factors affecting sustainability in agricultural higher education and to investigate the barriers for integrating sustainability into agricultural higher education programs.

## MATERIALS AND METHODS

This study has employed both quantitative and qualitative research methodologies (mixed methodology). The two methodologies are used equally and parallel to one another cross-validate and build upon each other's results.

The study population included three groups; the post-graduate students, professors and academic staff at two universities, Khouzestan Ramin Agriculture and Natural Resources university and Bu-Ali Sina University. For collecting quantitative data among 320 students, 174 were selected using a random sampling method based on the Morgan table. In order to collect qualitative data, 41 professors and academic staff of the two universities were selected based on awareness to the research's topics and the data were saturated by these samples. Therefore, the interview process did not continue and data collection stopped.

Gathering tool in quantitative part was a three-part questionnaire. The first part included the demographic features of the respondents, the second part consisted of the factors affecting sustainability at the higher agricultural education, and the third part was about the barriers for integrating sustainability into agricultural higher education system. A five- point Likert type scale from very low=1 to very high=5 was used for the second and third parts of the questionnaire. Both validity and reliability of the statements were done and the reliability rate of the questionnaire was 84% ($\alpha$ =0.84). Data processing and outputs analyzing was done by SPSS software. Data analysis, in quantitative section, was done by two parts of descriptive and analytic methodologies. In descriptive section statistics such as mean, percent, variance, and standard deviation were used. In analytic section non-parametric tests (Mann-Whitney, Kruskal-wallis) were employed.

For collecting qualitative data, semi-structured interviews were used. A Content analysis approach was used to analyze and interpret the data gathered from the interviews. Specifically, the 'summarizing content analysis' approach was adopted, in which the text is reduced step by step to generate the content which reveals

Table 4: comparing the views of respondents in terms of dependent variables.

| independent variable | dependent variable | test | Test value | P value |
|---|---|---|---|---|
| Gender (f/m) | agricultural higher education factors | Man Whitney | 2.903 | 0.009* |
| University | agricultural higher education factors | Man Whitney | 3.738 | 0.90 |
| Field of study | agricultural higher education factors | Kruskal-Wallis | 12.503 | 0.029* |
| Educational level | agricultural higher education factors | Man Whitney | 2.237 | 0.364 |

Table 5: factors necessary for a sustainable agricultural higher education center.

| Dimensions | Components | Factors |
|---|---|---|
| | Financial and funds | financial support and adequate funding |
| | | financial requirements Available for universities |
| | | Funding out of university |
| Economic issues | Employability | University and industry linkage |
| | | Attention to job in future |
| | | Create job opportunities |
| | | Train creative students |
| | | Create job information data base for graduates |
| | Productivity | Diversification agricultural educations |
| | | Improve agricultural productivity |
| | | Attention to economic needs of society |
| Social-cultural issues | Social issues | Attention to real needs of society during curricula |
| | | Public awareness towards sustainable higher education |
| | | Support social different enterprises at university |
| | | Attention to globalization in agricultural programs |
| | | Localization of agricultural curricula |
| | Culturalization | Protection of country's cultural heritage and ancient |
| | | Preservation of cultural values in agricultural curricula |
| | | Culture building through agricultural programs |
| Environmental issues | Environmental awareness | Students' awareness about environmental issues |
| | | Integrating environmental issues into agricultural programs |
| | | Emphasis on agricultural eco-friendly programs |
| | | Use clean energy in agricultural programs |
| | | Create and maintain university's enterprises about environment |
| | | Use other countries' experiences about environmental issues |

similar concepts and ideas: these common ideas are then categorized and summarized. According to Neuendorf (2001), this technique enables a large amount of textual information to be reduced to important concepts and ideas. Thus, after our content analysis of the interviewees' responses, frequently occurring concepts and ideas were identified.

## RESULTS

The descriptive results of the study showed that 53 percent of respondents were female. Of the respondents, 78.3 % were M.Sc. students and the rest were Ph.D. students. The respondent's age ranged from 22 to 54 with an average of 28 years. Other findings have been illustrated into table 1.

### Factors affect on sustainability in agricultural higher education

In order to determine the rank of each factors affect on sustainability in agricultural higher education a ranked mean from the respondents' viewpoints was calculated. As shown in table 2 the highest ranks relate to the following factors respectively, eliminate the gap between the academic and administrative departments, enough and new educational facilities and equipments, sufficient number of professors to students' ratio. In addition, the results showed that the lowest ranks refer to the two factors, development of virtual and e-learning education and balance between male and female students for agricultural careers.

### Barriers of integrating sustainability into agricultural higher education

In order to identify the obstacles of integrating sustainability into agricultural higher education a ranked mean of the respondents' viewpoints was calculated. As shown in table 3 the following barriers received the highest ranks respectively, employment problems of agricultural students and graduates, lack of effective linkages between the farmers, agricultural higher education and other administrations, lack of job opportunities for agricultural graduates, the lack of a stable structure for sustainable higher education, lack of adequate understanding on sustainable higher education.

To investigate the differences between the independent variables i.e. gender, level of education, field of education and university and the dependent variable of agricultural higher education fac-

Table 6: conditions and requirements for creating a sustainable agricultural higher education center.

| Components | Components | Common themes |
|---|---|---|
| | students | Balance between students and available possibilities |
| | | Encourage active students |
| | | Support students' research and ideas |
| | | Use students' participation extensively |
| | | Improve agricultural students' employment |
| | | Create job information data base for students |
| | | Emphasis on students research activities |
| | | Recruit the students with high interest and ability of agriculture |
| | | Enter agricultural students based on country's need |
| Human resources | Staff and professors | Use the professors with a high academic and research ability |
| | | Use a continuous assessment system for staff and professors |
| | | Use a continuous in-service training system |
| | | Emphasis on group and collaborative activities among the professors |
| | | Use adequate full-time professors |
| | | Encourage active professors |
| | | Use adequate operational experts and lab specialists |
| | Education | Relevancy of curricula with real needs of the labor |
| | | An education with practical aspects |
| | | Continuous evaluation system of curricula |
| | | Adequate number of practical credits |
| | | Up-to-date agricultural curricula |
| | | Integrate theory and practice |
| | | Improve quality of education |
| Infrastructure | | Attention to theory and practice simultaneously |
| | | Attention to multidisciplinary in agriculture |
| | Research | Feasibility study and need assessment programs |
| | | Emphasis on research project and activities |
| | | Emphasis on dissemination and applications of research findings |
| | | Create agricultural research colleges |
| | | Merge research with education |
| | | Provide an appropriate environment for research |
| | | Unification research with education |
| | Management and planning | Participatory management |
| | | Selecting managers consolatory not compulsory |
| | | selecting university chiefs in terms of competent |
| | | Designing the university policies and goals in terms of society's needs |
| | | Coordinating between departments |
| | | Use an evaluation and feed-back system |
| | outreach programs | Create special sustainability centers in each college |
| | | Promote outreach programs |

tors Mann-Whitney and Kruskal-Wallis tests were used. Results have been shown in table 3.The results in Table 3 show that there is significant difference between the respondents' views and their gender and field of study in the level of 5%.

**Results from open ended question about factors necessary for a sustainable agricultural higher education center**

A total of 41 faculty members, in the Bu-Ali Sina University, College of Agriculture were asked to share their opinions. Faculty members who participated in this research ranged in age from 29 to 55 years. The mean age of respondents was 38.23 years. The majority of employers were males (92.7%), and only 7.3% were females. Their years of job experience ranged from 1 to 27 years with an average of 8.7 years.

**Factors necessary for a sustainable agricultural higher education center**

Faculty members were asked to provide their opinions about necessary components for a sustainable agricultural higher education center. This was asked in the form of an open question. Content analysis method was used to interpret

and analyze the data gathered from interviews. The method of "summarizing content analysis", as explained earlier, was employed in this regard. Thereby, the text is reduced step by step to items showing the same concepts and ideas. Then the common ideas are categorized and summarized.

According to Neuendorf (2001), in this technique, a large amount of textual information can be reduced to more important concepts and ideas by analyzing the text and searching for the frequently used key words. After analyzing the contents of the given answers, frequent concepts and ideas were identified. These were finally merged to six common ideas as the main components necessary for a SAHEC include financial and funds, employability, productivity, social issues, building culture, and environmental awareness (See table 5).

**Possibilities and resources for creating a sustainable agricultural higher education center**

The respondents were asked about necessary resources and requirements for creating a sustainable agricultural higher education center. According to the faculty members interviewed there are two main possibilities to create a SAHEC: human resources and infrastructure. Most of interviewees believed that human sources like qualified professors, motivated students and specialist staff need to be trained and prepared for creating a SAHEC. The interviewees expressed that the following components are needed to be changed for a SAHEC: education, research, management and planning, outreach programs (table 6).

A few typical responses are quoted as follows:

"Resources and possibilities for a sustainable agricultural higher education center can be divided into two main sources … human and infrastructure. Human resources consist of experienced professors both domestic and foreign, specialist staff and experts, and consciousness students. …effective management and planning should be employed during starting to integrate sustainability into agricultural higher education center." "I believe that a joint committee between universities and agricultural organizations in each state is needed to support outreach programs of the sustainable agricultural higher education centers."

## CONCLUSION

In spite the development and integration of sustainable development's issues into universities' programs throughout the world, this issue is still considered as a new idea or an innovation. Therefore, the adoption and dissemination process of sustainability within the higher education institutes is still dealt with as a challenging topic at the universities. The main aim of this research was to investigate both barriers and factors affecting the sustainability of agricultural higher education system (AHES) in Iran. according the results of this study some of the most important barriers were: inability of AHES in order to use students and graduates in agricultural positions and occupations, a lack of strong and effective relationship between AHES and farmers, a lack of new planning for agricultural graduates' employment, lack of adequate structures and seedbeds such as cultural and social plans about sustainable development issues. This result echoes the findings obtained by Cortese (2003) and Velazques *et al*. (2006).

Although integrating sustainability into university system encounters some barriers and challenges, this can create many opportunities and potentials for higher education institutes by means of these opportunities the educational activities and programs may be better improved in line with an effective and sustainable education. This result also has been implied by conducted studies of Lozano (2006) and Ferrer-Balas *et al.* (2009).

It is apparent that higher education at all and agricultural higher education in particular needs a series of available conditions, factors and resources to be sustainable. The result showed that the necessary factors for integrating sustainability into agricultural higher education were: financial and credit supports, entrepreneurship and self-employed plans, productivity in agricultural products, social issues, culturalization, and environmental awareness. It is necessary to note these factors may not be effective unless they are in a two-way communication and interaction (Figure 2).

An important point identified in this study was related to essential prerequisites for a sustainable university. In addition to the three main components in a university include education, research, and management which are focused

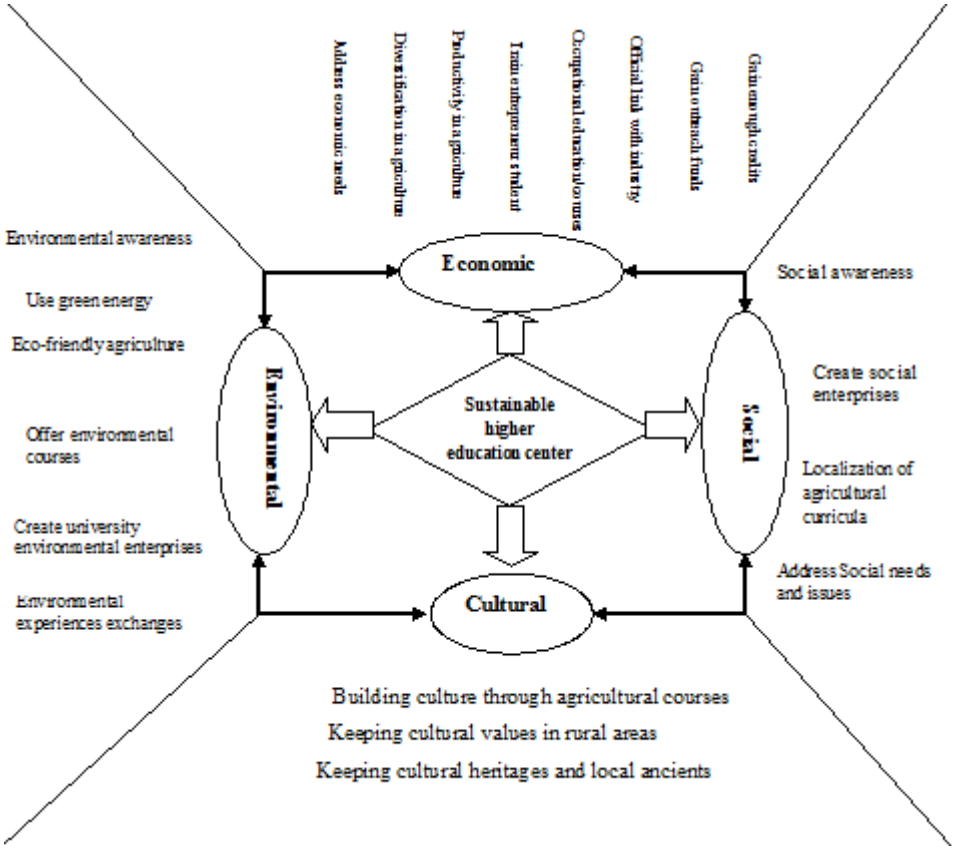


Figure 2: A model for a sustainable agricultural higher education center

by scholars such as Ferrer-Balas *et al*. (2009), a fourth element should be available responsible for planning, organizing, and implementing the special programs and activities of sustainability at the university. This component can be called sustainability center or sustainability committee. According the result a new model of sustainable university can be drawn and presented in which the four components include education, research, management, and sustainability center with a two-way communication with both themselves and the society can be adapted and tailored to the real needs and conditions.

Another important point for being a sustainable university appears on bringing a two-way collaboration between governmental, non-governmental, private and investment centers. This may flow a two-way learning process between inside and outside the university and then lead to create new ideas continuously (Figure 3).

**According to the results, the following recommendations can be presented**:

An agricultural sustainable higher education center will be suitable if the agricultural courses and curricula are presented with emphasis on practicality, applicability, employability, and compatibility with the real needs of society. In an agricultural sustainable higher education center the contents and topics should be selected in terms of local and ecological situations and the students' interests and motivations so that these programs can be changed easily and continuously.

It is suggested that in an agricultural sustainable higher education center in Iran case, education-based programs should be integrated into research-based programs. In this manner, the following issues for changing the courses and curricula need to be taken into attention, the factors such as to establishing new agricultural businesses, to promote entrepreneurship skills, to create new sustainability models, to apply environmental syllabus, to consider marketing issues, and to make a link with public, non-public, and private sectors. Furthermore, an agricultural sustainable higher education center should act on basis of four management, education, research, and sustainability center simultaneously. In terms of management factor managers' selec-

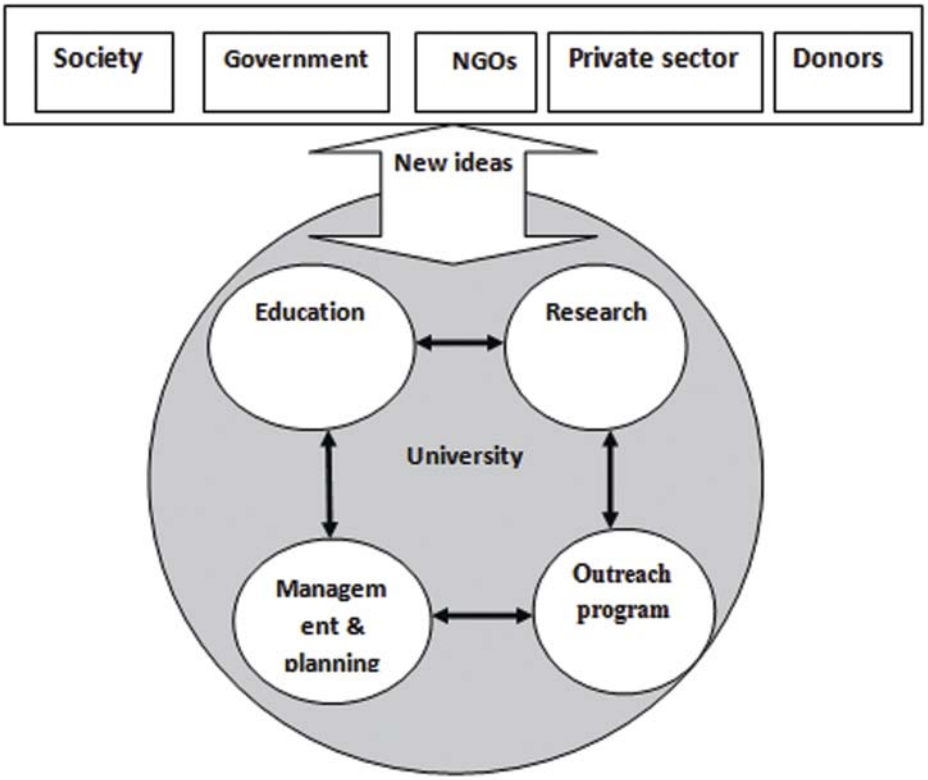


Figure 3: Necessary components for an agricultural sustainable university (source: research findings)

tion should be based on both students and professors' votes participatory. In this regard, the main prerequisite should be considered competency and skill of managers, other attributes for management of agricultural sustainable higher education center identified in this study were: use a participatory management approach, considering gender analysis in managerial positions, focus on continuous in-service training and learning organization theory, use a non-centralized decision making sensitive to environmental issues, managers' ability to obtain outreach funds, and focus on using virtual contacts by subordinators.

In terms of teaching-learning factor, an agricultural sustainable higher education center should be in such a way that a combination of teaching methods and strategies be used in spite the limited ones. An agricultural sustainable higher education center should use learner-oriented approaches in which the learner's part and involvement has a key role. Therefore, in an agricultural sustainable higher education center the teaching-learning approaches should use include participatory methods, observation methods, practical practices, discussion, field trips and tours, demonstrations and fairs, seminars and workshops, using national and international guest speakers, use e-learning methods, teaching farm, using new instructional technologies such as video projectors, computers etc.

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