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Case Study

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Assessment of University Sustainability (Case Study: Iran Agricultural and Natural Resources Universities)

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Abstract

Sustainability challenges in our time such as climate change, food security, water consumption, pollution, environmental degradation and other socio-economic concerns are the main challenges for present and future generations. Therefore, society is increasingly sensitive to sustainability issues and seeks information to achieve sustainability. Nevertheless, in universities, still environmental issues are attending and its non-material aspects such as society, cultural, and ethical issues have been neglecting. Therefore, the present study undertakes to assessment level of sustainability in Iran agricultural and natural resources universities according to all dimensions of sustainable development. Statistical population consisted of 2248 students in agricultural and natural resources universities, from that 204 students selected as sample using simple random sampling. A made questionnaire used to collect data. Its validity proved by using content and structural validity, and its reliability confirmed by Cranach's alpha ($\alpha \geq 0.79$). Data analyzed by SPSSWin20 software. Findings showed that at environmental dimension, use of energy-saving bulb, use of office automation systems, and separate potable water from other uses have paid more attention to themselves. In social dimension, universities more focusing to sport competitions aimed to ensuring students health, checking cleanness of dining rooms, and hold conferences on sustainability issues. In education dimension, university's managers have focused on developing students' abilities to informed decision-making, establishing flexible curricula to educate sustainability issues, and create relationship between educational content

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and sustainability dimensions. Findings from ranking of attention to sustainability dimensions at universities showed that universities most emphasis on social, educational, and environmental dimensions and research and economical dimensions have been underestimated.

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Keywords: Sustainable development, Assessment, Iran universities, Sustainability dimensions

1. Introduction

Sustainability challenges in our time such as climate change, food security, water consumption, pollution, environmental degradation and other socio-economic concerns are the main challenges for present and future generations (Rotmans and Loorbach, 2008). Therefore, society is increasingly sensitive to sustainability issues and seeks information to achieve sustainable development [SD] (Lozano et al., 2013). Meanwhile, higher educational institutions play an important role in societies moving toward sustainability (Ferrer-Balas et al., 2009).

Universities by providing information and environmental education accelerate the human society movements toward sustainable development (Tukker et al., 2008; Jackson, 2009; Musti et al., 2011). This has been widely acknowledged by regional and international policies such as UNESCO training and 21st century agenda for sustainable development from 2005 to 2014, which expanded green university movement and created a wider educational program of sustainable development in universities (Thomas, 2009).

Despite university leaders are acquaintances with concept of sustainable development, they still do not have enough knowledge about what is sustainable university. Scoulos (2010) have provided a definition of a sustainable University. Sustainable university is a university, which is able to deliver the message of integration and progress in all aspects of SD, to promote socially just, economically prosperous and environmentally benign development, through the concepts, principles and methods of Education for Sustainable Development (ESD). According to his definition, it is possible to envisage three levels of analysis:

- (1) Curriculum and programs;
- (2) Governance, processes and culture;
- (3) Infrastructure.

Wright (2004) has classified universities' sustainability-oriented activity in five more elements that were detected during the analysis, which update the university system:

- 1) Fostering university collaboration;
- 2) Promoting transdisciplinary;
- 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 help foster multiplier effects;
- (5) Including SD in the institutional framework, where SD should evolve as the 'Golden Thread' integrating all of these.

Overall, universities are expected to engage in sustainability both internally (as an organization) and externally (as an agent in the region). This covers the university's mission, education and research, administration of the university, external stakeholders (regional mission), and personal activities of academic community members. The experiences of green universities in emerging countries (Wals, 2014) indicated some common factors for progress:

- 1) Collaboration with local governments;
- 2) Effective leadership;
- 3) Stakeholder inclusion in strategic planning;
- 4) Safeguarded funding;
- 4) Transformation of the curriculum and administrative structure towards sustainability;
- 5) The greening of the campus.

These have been discussed as more or less underpinning factors in most of the studies examining sustainability issues in higher education. Some of the studies present different universities' rankings and ranking tools or assessments of curriculum sustainability (Lozano et al., 2013). Some of the case studies focus on campus sustainability and participation or the role of participation in sustainability assessment (Disterheft et al., 2012).

Hence, a pivotal role for universities over the coming decade will be inevitable. As Cortese (2003) explained: Universities bear profound responsibilities for increasing awareness, knowledge, technology, and tools to create an environmentally sustainable future. Universities have all the expertise needed to develop an intellectual and conceptual framework for achieving this goal. They must play a strong role in education, research, policy development, information exchange and community outreach to help create an equitable and sustainable future. Universities should be applying those strategies that considered all sustainable development aspect to achieve sustainability. Nevertheless, still environmental issues are attending in universities and its non-material aspects such as society, cultural, and ethical issues have been neglecting. Therefore, the present study undertakes to assessment level of sustainability in Iran agricultural and natural resources universities according to all dimensions of sustainable development.

2. Methodology

This study focused on sustainability assessment in Iran agricultural and natural resources universities. Statistical population of this research consisted of 2248 students, from that 204 students selected as sample using stratified random sampling. A made questionnaire used to data collected that its validity proved by sustainability expertise in universities, and its reliability confirmed by Cranach's alpha ($\alpha \geq 0/79$).

Totally, 68 items in five categories (environmental, social, economical, educational, and research) designed to assessment level of universities sustainability. In each section, students were asked to highlight level of universities attention to each item and its importance to institutionalization sustainability in university by giving scores from one (least attention and importance) to 10 (most attention and importance). The sum of scores in each section considered as level of university sustainability. Finally, data analyzed with SPSS_{win20} and Excel₂₀₀₇ software.

3. Findings

Descriptive findings showed the mean age of respondents was 26.57 years with standard deviation of 3.46 years and their age range was in 24-38 years. 47.5 percent of the sample was male and 52.5% was female. Ranking of attention to sustainability issues by universities managers showed at environmental dimension, use of energy-saving bulb, use of office automation systems, and separate potable water from other water have paid more attention to themselves. At the same time, student said that these issues have essential role in universities movement towards sustainability. In social dimension, universities more focusing to sport competitions aimed to ensuring students health, checking cleanness of dining rooms, and hold conferences on sustainability issues. In contrast, respondents highlighting attention to students' demands, have open-days at universities, and holding the tradition of tree planting at the universities for institutionalization of sustainability in universities. In education, university managers have focused on developing students' abilities to informed decision-making, create flexible curricula to educate sustainability issues, and relationship between educational content and sustainability dimensions. In contrast, student emphasis on apply creative teaching approaches (such as brainstorming strategy, group discussion, problem solving, etc.) by professors, and proportions of educational content with occupation opportunities as an important area for universities to move to sustainability. These findings presented in Table 1.

Findings from ranking of attention to sustainability dimensions at universities showed that universities most emphasis on social, educational, and environmental dimensions and research and economical dimensions have been underestimated. It is should be noting that, due to average scores of each dimensions, level of sustainability indicators are in low at the Iran agricultural and natural resources universities and their performance has not been satisfactory (Table 2). However, finding showed that Ramin University in sustainability indicators - expected of economical indicators - was at the better status in comparison to other universities. Gorgan University is more stable in term of educational, research, and economical indicators than Sari University; Instead, Sari University has a better performance in social and environmental indicators (Diagram 1).

Table 1

Ranking of attention on sustainability issues by universities manager and their importance to achieve to sustainable university from students' perspective.

Rank	Level of attention		Scales	Level of importance		Rank	Sustainability dimensions
	SD	Mean of 10		Mean of 10	SD		
3	1.67	6.97	Using office automation	7.41	2.89	3	Environmental
1	2.17	7.15	use of energy-saving bulb	7.47	2.64	2	
4	2.65	5.02	Using miniatured university farms	6.75	2.00	9	
5	2.56	4.04	Using sprinkler irrigation systems at the university farms	7.28	2.77	4	
3	3.12	6.00	Separate drinking water from other water	7.75	3.22	1	
6	2.02	4.50	Using public transportation in university	6.08	2.71	7	
7	2.00	4.25	Using double-glazed windows to prevent energy dissipation	6.65	2.53	10	
10	1.60	1.00	Establishing exhibitive farms to produce organic products	7.13	2.78	5	
9	2.07	2.00	Separation of dry and wet waste at the university environment	7.12	2.78	6	
8	2.31	2.45	Use of water pressure breaker to faucets at the university	6.48	2.33	11	
12	0.50	0.57	Using renewable energies	6.63	2.71	8	
11	1.53	77.0	Using of electronic faucets	5.03	2.60	12	
1	2.45	5.02	Establishing a green house at the university farm	6.65	2.75	0	
2	2.78	4.55	Establishing a dairy farm in the university	6.34	2.40	12	
5	1.84	2.75	Earn money by holding seminars	6.70	2.67	9	
3	2.08	2.81	Feeding live stock with fodder produced at the university	6.58	2.60	11	
4	9.25	2.85	Use of university's agricultural products at the students dining room	6.50	2.65	6	
6	2.18	2.70	Selling university's agricultural products	6.91	2.92	5	
9	2.00	2.46	Establish the knowledge based companies	7.05	2.49	2	
7	2.14	2.59	Hold exhibitions at the University to sale agricultural products	7.14	2.55	1	
10	2.07	2.48	Earning money from non university research projects	2.85	2.29	7	
8	2.27	2.50	Considering relationship between university and industry	7.02	2.30	4	
12	2.02	1.00	Allocate financial facilities to the students for commercialization their own ideas	7.02	2.67	3	
11	2.00	1.04	Established fishpond at the university's farm to earn money from it	6.64	2.74	10	
10	2.27	1.80	Creating swimming pools in the campus and earning money from it	5.72	2.78	13	
1	7.31	3.87	Having scientific journals	6.60	2.43	2	
3	1.88	3.10	Conducting Scientific Conferences on Sustainability at the University	6.34	2.54	3	
5	1.85	2.57	Allocate some of university budget to sustainability-oriented researches	6.00	2.40	4	
4	2.05	3.18	Grants to thesis which are related to sustainability	6.78	2.20	1	
7	1.90	2.39	Pay cost of students participation in national and international conferences which related to sustainability	5.09	2.49	7	
6	2.00	2.41	Pay cost of publications which are related to sustainability by university	5.23	2.61	6	
2	3.71	3.40	Provide short term study for students related to sustainability issues	5.94	2.47	5	

Table 1

Ranking of attention on sustainability issues by universities manager and their importance to achieve to sustainable university from students' perspective.

Rank	Level of attention		Scales	Level of importance		Rank	Sustainability dimensions
	SD	Mean of 10		Mean of 10	SD		
1	2.07	6.25	Conducting sport competitions aimed to ensuring students health	5.25	2.25	11	Social
2	2.56	5.21	Continuous monitoring on dining room cleanliness	5.30	2.35	10	
4	2.73	5.01	Serving seafood (including fish and shrimp) in the diet of students	7.72	2.41	17	
7	2.49	4.18	Lack of gender-discrimination among students	4.08	2.08	19	
3	3.02	5.11	Conducting scientific conferences and congresses on stability issues	5.57	2.52	9	
9	2.32	3.81	Given the paperworked procedures to prevent students from wasting time	5.10	2.35	12	
5	2.75	4.50	Holding facilities of free panel of the university	6.56	2.63	3	
6	2.05	4.77	Reducing bureaucracy	6.79	2.57	5	
8	2.57	3.89	Give some of university affairs to students	5.80	2.78	8	
10	2.74	4.77	Establishing environmental support forums at the university	6.48	2.66	16	
15	1.58	2.58	Setup a non environmental related banners in the campus	6.00	2.41	7	
17	1.83	2.41	Continuity visits from students dormitories by university's managers	4.00	2.40	20	
12	2.31	2.90	Provide online environmental, social, and economical information on the university's website	5.08	2.50	13	
16	2.18	2.57	Holding workshop on organic products	5.21	2.59	6	
13	2.04	2.30	Conducting meeting between students with university's to information sharing	5.35	2.70	4	
18	2.48	2.84	Conducting field trip to students with focusing on sustainability issues	4.51	2.24	15	
11	2.58	3.00	Attention to students' demands in relation to sustainability issues	7.50	2.25	1	
14	2.30	2.52	Introduction students who have competences in regard to sustainability issues to industrial parks	4.35	2.81	18	
10	2.25	2.37	Having open days at the university where local community can go to the colleges and see scientific agricultural products	6.04	2.56	2	
22	2.07	2.00	Providing students' needs to communicate with Green Universities	4.93	2.50	14	
21	2.09	2.01	Establishing store place at the campus to sale universities' organic productions	7.00	2.60	21	
20	2.48	2.36	Displaying film with the theme of environmental pollution for students	4.04	2.65	22	
2	2.25	3.09	Compatible between curricula content with local community problems	7.50	2.70	1	
4	2.15	2.88	Compatible between curricula content with existing occupation opportunities	7.23	2.63	3	
1	2.03	4.04	Provide a flexible condition for sustainability related education at the university	6.50	2.87	11	
3	2.75	2.04	Students empowerment to informed decision-making	6.75	2.58	9	
7	2.12	2.75	Sustainability related knowledge sharing in the teaching process	4.51	2.33	6	
13	2.09	2.45	Inappropriate sustainability related issues in curricula	6.78	2.63	8	
10	2.07	2.61	Facilitating conditions for social learning	5.77	1.67	11	
6	2.30	2.70	Teachers attention to sustainability issues in the classroom	6.80	2.50	4	
5	2.27	2.81	Employable students at the university	4.21	2.09	14	
8	2.23	2.75	Encouraging students environmental responsibility during educational programs	6.85	2.54	5	
11	2.12	2.54	Using of creative teaching approaches (such as brainstorming strategy, group discussion, problem solving, etc.)	7.51	2.43	2	
5	2.09	2.65	Enabling teachers on sustainability related issues	4.73	2.64	10	
19	2.20	2.57	Considering students' talents and fitness while educational content is being developed	6.12	2.70	16	
14	2.17	2.10	Attention to learner-centered in teaching process instead of teacher-centered	6.70	3.70	7	

Table 2
Ranking of universities attention to each dimensions of sustainability.

Dimensions	Environmental	Social	Economical	Education	Research
Mean	47.33 from 120	84.98 from 220	38.96 from 130	40.93 from 140	21.5 from 70
Standard deviation	12.43	28.97	16.83	24.83	10.92

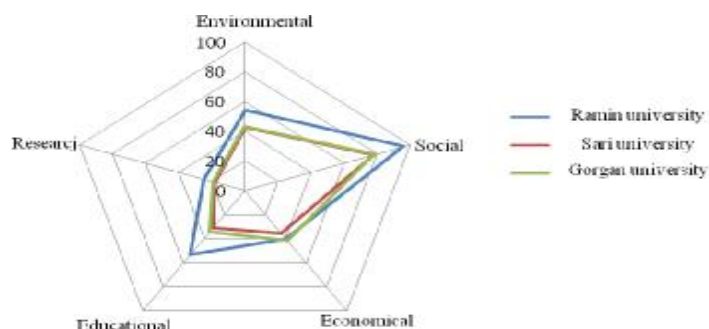


Diagram 1. Level of universities sustainability according to its dimensions.

4. Conclusion

Universities have a moral responsibility for increasing community awareness, knowledge, skills, and values, which needed to achieve more future sustainability. Especially they are training people who will be taken key social responsibilities to achieve more sustainable lifestyle model. Actually, sustainability can be accessible if universities activities caused to increase level of sustainable development.

Many efforts have been made to integrate sustainable development in universities structure. Consequences of these efforts indicated that co-design and co-created sustainability curricula and integrated sustainability issues into academic process according to its multiple stakeholders could solve many challenges which university encounter with them to incorporate sustainability in their structure. Therefore, attention to students' attitudes and demands in related to sustainability issues are essential subjects for university achieving to sustainability. In this regard, finding showed in Iran Agricultural and Natural Resources University co-design and co-creation among students and managers were at low level. In many cases, there was a difference between student's demands and universities activities toward sustainability. Therefore, according to findings of this research we suggest that:

ü Respondents in addition emphases on health issues to achieve sustainability in universities, highlighted communication issues and relationship without reach community. Therefore, it is essential that universities managers employ appropriate participation approaches (e.g. value co-creation process) to achieve common understanding of sustainability issues at the universities. This facilitates necessary conditions for university's internal stakeholders to co-operation toward achieve a sustainable university. Moreover, activities like open days at the university where local community can go to the colleges and see scientific agricultural products, holding tradition of tree plantation at the university, conducting field trip to students with focusing on sustainability issues, and facilitate conditions for students to communicate with Green Universities are essential for increase outreach relationships.

ü Respondents emphases on activities such as holding exhibitions at the University to sale agricultural products, relationship with industry sectors, and establish the knowledge-based companies to achieve economical sustainability at the universities, it is essential that university managers pay attention to these activities if they want institutionalized sustainability in the universities' structure.

ü Since achieving to sustainability requires equal attention to all of its dimensions, it is necessary that managers of agricultural and natural resources universities consider all sustainability aspect and allocate budgets to all of these dimensions.

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