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Article

# Designing and Implementing Effective Campus Sustainability in Saudi Arabian Universities: An Assessment of Drivers and Barriers in a Rational Choice Theoretical Context

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**Abstract:** Saudi Arabia is a developing country that is experiencing a rapid growth in its population and level of urbanisation. Higher education (HE) in the country has developed rapidly over the last ten years, and it is still moving through numerous major reforms. Largely, the concept of sustainability has not yet been formally adopted in public institutions in a way that could sufficiently remedy the range of activities that currently impact negatively on the environment. The central aim of this paper is to examine the extent to which planning and action for sustainability is currently being taken on university campuses in Saudi Arabia, and to review the opportunities and challenges for encouraging and enabling further progress to this end. The research that the paper draws on specifically investigated the influence of decision makers' personal knowledge and perceptions within Facilities and Project Management (FPM) departments at selected Saudi universities, and the constraints faced by FPM decision makers with regard to the promotion of sustainability on campus. This exploration was supported by the development of a theoretical framework that draws on rational choice theory (RCT). The research revealed mixed levels of prevailing knowledge and awareness towards sustainability among FPM decision makers within the case study university campuses. Cost notably came across as a dominant influence on FPM decision makers' choices and decisions, and it undoubtedly plays an important role in shaping the decision-making process alongside other key organisational factors. A number of barriers facing the incorporation of sustainability emerged with clarity, such as the lack of supportive leadership, the lack of sustainability knowledge and awareness among senior management and an absence of sustainability-related legislation policy or strategic direction in the HEIs concerned.

**Keywords:** sustainability; Saudi Arabia; higher education institutions; facilities management; rational choice theory

## 1. Introduction

University campuses can be viewed as important microcosms of the built environment that encompass a range of activities and settings. Together, they exert an influence on the natural environment due to their large size, substantial population and the complexity of activities that take place across their campuses [1]. The adoption of sustainability into HEIs activities and practices can lead to a reduction in the negative environmental impacts of routine operational and behavioural practices in a variety of ways [2]. Owing in a large part to the global awareness of the significant impact of campus

operations and activities, there are many declarations for sustainability in HEIs that have already been signed up to by more than 1400 universities over the last two decades [3]. From a 'built environment' perspective, the choices and decisions made during building design and construction will inevitably contribute to the overall 'status' of campus sustainability—particularly with regard to energy efficiency and the organisation's carbon footprint. According to Velazquez et al. [4], activities that are carried out within university campuses have both serious direct and indirect impacts on the environment. Universities can play an important role in the transition towards sustainability by addressing energy and water consumption and waste management, and by adopting recycling initiatives [5,6].

In the context of HEIs, facilities and project management (FPM) departments are key actors responsible for managing and controlling a range of campus activities, such as planning, construction, operations, maintenance and waste disposal [7]. Ancarani and Capaldo [8] assert that FPM departments at HEIs should take the lead in stewarding all campus resources and assets. Thus, facilities managers could play an important role in appointing appropriate regulations and systems for strategic, tactical and operational systems [9]. Furthermore, Sharp [10] argues that the successful institutionalisation of campus sustainability practices requires a university-wide commitment to supporting sustainable campus operations and maintenance. A number of studies have identified challenges that can hinder efforts to implement and integrate sustainability initiatives into FPM activities. These challenges relate to the skill and knowledge levels of management and decision makers, governance models, organisational cultures, and individual behaviours and interests. According to Hodges [11], the implementation and achievement of sustainable practices in FPM departments is often complex for several reasons, including a lack of capabilities, knowledge and preparation among decision-makers and facilities managers. Yang et al. [12] emphasised that the ability to manage the process of moving an organisation toward more sustainable practices is fundamental. Elmualim et al. [13], Nielsen et al. [14], Shah [9] and Bosch and Pearce [15] identify further challenges associated with the FPM departments and sustainability, including:

- Limited data on energy and water consumption;
- Absence of performance indicators;
- Lack of guidance documentation;
- Lack of competence in changing the perspectives of individuals and groups;
- Lack of incentives in carrying out planning concerning environmental issues;
- Lack of senior management commitment;
- Limited knowledge about environmental and sustainability issues.

The Kingdom of Saudi Arabia has developed a higher education system over the last four decades which includes 36 independent universities, and 27 that are funded in their entirety by the Saudi Government. In comparison with countries in the Western world (including the UK, America, Australia and Canada) the application of sustainability principles on Saudi university campuses is very much in its infancy [16]. Accordingly, the study and findings from it presented here provide a fresh understanding of the influence of decision makers within the FPM and organisational environment for planning and action on university campuses in Saudi Arabia. This will help in the identification of specific drivers and barriers to establishing workable sustainability initiatives and practices in Saudi HEIs that might enable them to attain the level of 'sustainability success' that has been achieved at many university campuses in other parts of the world, including some in the UK and other countries [17–21].

The study utilized rational choice theory (RCT) in order to provide a coherent framework from which to examine the central policy and decision-related issues that are interconnected with the key environmental, economic and social issues being investigated. The study also examined and appraised the presence, influence and operation of environmental management systems. A key focal point of inquiry was investigating the influence/impact of knowledge and perceptions, interests and preferences—alongside cost and other constraints on planning and action on sustainability—for FPM decision-makers during the decision-making process.

The study of campus sustainability in HEIs has given rise to a broad and growing body of literature in relation to university activities in the UK and other Western nations, in particular including, for example, America, Australia, Canada and Sweden. The published literature tends to debate the incentives and benefits for incorporating sustainability into universities' practices and activities, obstacles to integrating sustainability, and general strategies and recommendations [17,22,23]. However, very little published literature exists which specifically explores the fundamental issues in relation to decision making, particularly in the context of Saudi Arabia. The study reflects the level of recognition and action on the three central sustainability 'pillars' as a strategic priority by FPM decision makers, in order to provide evidence and recommendations on how the concept of sustainability could be pragmatically and effectively delivered in Saudi universities. In addition, understanding the decision-making processes that inform those choices and pathways of development by decision makers within FPM departments is a key line of inquiry reported in this paper. One of the main contributions is the proposal of a workable set of approaches for the efficient establishment of on-campus sustainability that could be applied with suitable modifications across HEIs in Saudi Arabia. The structure of the paper begins with a section examining sustainability and higher education institutions, reviewing campus sustainability definitions and concepts and exploring the current status quo of sustainability in HEIs in Saudi Arabia. The methodological approach that was adopted is then described and justified, with a thematic presentation of results provided in the section that follows this. The application of Rational Choice Theory is subsequently presented in a discursive analysis that concentrates on the three key areas of campus sustainability decision-making and action that emerged from the empirical research. The article concludes with a re-iteration of key findings, alongside some recommendations for policy and HEI decision-makers.

## 2. Sustainability and Higher Education Institutions (HEIs)

According to the Brundtland Report (1987), HEIs are influential institutions that should actively integrate the principles of sustainability into their plans, actions and activities, including systems that govern the operation of university campuses [24]. Growing concerns about global warming and climate change, as well as the increasing costs associated with campus operational activities, have led to new thinking about teaching and research programmes and decisions regarding the built environment of university campuses. In 1997, UNESCO stated that, "... the goal of higher education is to make people wiser, more knowledgeable, better informed, ethical, responsible, critical and capable of continuing to learn. Education, in short, is to achieve sustainable development" [25] p.40. Moreover, the emerging concept of sustainability at many HEIs promotes sustainable development and increases the awareness of community members relating to development and environmental concerns [26].

This environmental transition has inspired many university researchers to study how HEIs can be made more sustainable [27]. Universities are broadly considered to be one of the main types of organisation that should address environmental issues and societal concerns by identifying and addressing sustainability-related issues [28]. Globally, many HEIs have incorporated sustainability awareness into their mission statements, educational processes and business models [29]. In essence, HEIs have the ability to directly influence their surrounding environments, social activities and actions through their daily practices [30] due to factors such as their size, number of staff and students, and their rates of material consumption. As a result, Wright [31] argues that it is both reasonable and logical to encourage universities to become leaders in sustainability initiatives.

Specific examples of ways in which universities can play an important role in the transition towards sustainability include addressing energy and water consumption, and improving their waste management and availability of recycling facilities [5,6]. Many studies have revealed the challenges of implementing such initiatives, including strategic planning conflicts, a general lack of campus sustainability policies and regulations, financial and funding obstacles, and a dearth of leadership support. Table 1 summarizes some current and proposed campus sustainability principles from various studies into key dimensions of sustainable development.

**Table 1.** Classification for key sustainability dimensions at HEIs [32].

Dimensions of Sustainable Development	Current and Suggested Practices	Authors
Environmental	<ul style="list-style-type: none"> <li>Resource waste management systems (e.g., energy, water, and raw material consumption)</li> <li>Pollution reduction and recycling activities</li> <li>Formation of environmental research centres and committees</li> </ul>	Krizek et al. (2012); Endut et al. (2011); Yen et al. (2010); Newman and Fernandez (2007); Emmanuel and Adams (2011); Mat et al. (2009)
Social Human aspects	<ul style="list-style-type: none"> <li>Development of sustainability-related curricula and courses</li> <li>Formulation of healthy lifestyle programmes for faculty and staff</li> <li>Implementation of healthy and ergonomic work environments</li> <li>Promotion of work-based and lifelong learning programmes</li> <li>Involvement of student government groups in decision-making processes (e.g., budget allocations)</li> <li>Employment of skilled environmental professionals</li> </ul>	Fien (2002); Ferrer-Balas et al. (2008); Johnston (2007)
Social aspects	<ul style="list-style-type: none"> <li>Formation of university-wide sustainability change agents</li> <li>Sustainability-related information and knowledge sharing via media (e.g., email, bulletin, conference)</li> <li>Formulation of student and faculty task forces to educate and promote campus sustainability initiatives</li> <li>Collaboration with NGOs and consultants to anticipate future needs of and demands on graduates</li> <li>Creation of institutes and projects that ensure equal opportunities and address social issues</li> <li>Fostering student participation in community and social activities</li> </ul>	Fadzil et al. (2012); Newman and Fernandez (2007); Johnston (2007)
Economic Physical aspects	<ul style="list-style-type: none"> <li>Green design and construction management procedures</li> <li>Sustainable transportation systems (e.g., bus programme and campus bicycle plans)</li> </ul>	Newman and Fernandez (2007); Johnston (2007); Fien (2002); Krizek et al. (2012)
Financial aspects	<ul style="list-style-type: none"> <li>Implementation of green campus loan funding mechanisms</li> <li>Adoption of ethical and life-cycle costing systems</li> <li>Implementation of green purchasing policies (e.g., recycled products)</li> <li>Implementation of sustainable and responsible procurement practices</li> </ul>	Newman and Fernandez (2007); Johnston (2007)

### 2.1. International Declarations and Sustainability in HEIs

Over the last three decades, the understanding and practice of sustainability at HEIs has advanced through a series of international declarations, such as the Talloires (1990), Kyoto (1993) and Graz

Declarations (2005), and the International Sustainable Campus Network ISCN/GULF Charter (2010). These and other relevant policy documents are listed in Table 2. In 1978, the subject of sustainability in higher education was introduced in the United Nations UNESCO-UNEP's International Environmental Education Programme [33,34]. However, university action in stimulating sustainability initiatives is relatively new, and has only become well known since the 1990s, when a group of university leaders decided to commit to the Talloires Declaration in 1990 [35]. Since then, a number of national and international declarations have related sustainability to the policies of HEIs shown in Table 2 [36]. As a result, incremental but growing interest in sustainability at HEIs has led universities around the world to engage their decision makers, administrative staff, students and faculty in moving toward the implementation of pragmatic sustainability policies and strategies [1].

**Table 2.** Declarations related to sustainability in higher education (adapted from [36]).

Year	Declaration
1972	The Stockholm Declaration on The Human Environment
1990	University Presidents for a Sustainable Future: The Talloires Declaration
1992	Association of University Leaders for Sustainable Future (founded 1992 in the USA)
1993	Ninth International Association of Universities Round Table: The Kyoto Declaration
1993	Association of Commonwealth Universities' Fifteenth Quinquennial Conference: Swansea Declaration
1993	The Halifax Declaration
1994	The Conference of European Rectors (CRE) Copernicus Charter
1996	Ball State University (USA) Greening of the Campus conference
1997	International Conference on Environment and Society—Education and Public Awareness for Sustainability: Declaration of Thessaloniki
1999	Environmental Management for Sustainable Universities (EMSU) conference
2000	Global Higher Education for Sustainability Partnership (GHESP)
2001	Lüneburg Declaration on Higher Education for Sustainable Development, Germany
2004	Declaration of Barcelona
2005	Graz Declaration on Committing Universities to Sustainable Development, Austria
2009	Torino (Turin) Declaration on Education and Research for Sustainable and Responsible Development, Italy
2010	International Sustainable Campus Network ISCN/Global University Leaders Forum GULF Charter 2010

As university campuses are often considered as 'small cities' [37] from a built environment perspective, the decisions made around their building design, construction, daily practices and management inevitably influence a university's energy efficiency, and have the potential to reduce the carbon footprints of these institutions [1,31]. Wright and Wilton [38] suggest that the dominant conceptualisation of sustainability at universities has centred mainly on environmental factors, particularly energy and natural resource management. However, the policy documents discussed previously have generally not given campus operational activities a high priority. Wright [34] found that university operations have been considered less important in the majority of these documents, but also that they place great emphasis on CO<sub>2</sub> reduction. For example, "... surprisingly, the notion of developing more sustainable physical operations on the university campus does not seem a priority for the majority of declarations [32] p.11."

Admittedly, these declarations could be utilised as mere publicity with respect to implementing campus sustainability policies, as they can be signed without any capacity to deliver a practical plan for sustainable future; an example of 'greenwashing', in the opinion of Helvarg [39]. Put another way, simply endorsing a declaration is not proof of a university's commitment to sustainability [40], and many HEIs have been unsuccessful in integrating campus sustainability principles into their policies, academic activities or operations [41].

## 2.2. Defining Campus Sustainability

While the adoption of sustainable practices within universities is often defined as ‘campus sustainability’, an understanding of the concept of sustainability can be considered a milestone in facilitating its organisation and implementation [42]. By contrast, the term ‘sustainable campus’ typically lacks a common and generally accepted definition. For instance, the meaning of the term sustainable campus can vary by source (see Table 3), as can the degree to which the environmental, social and economic ‘pillars’ of sustainable development are emphasised. Furthermore, the term includes components of campus academic and administrative staff, students and operations. Over the last few decades, the concept of the sustainable university has emerged to include sustainability-related vision and mission statements, university-wide sustainability committees, and strategies such as education, research, outreach and partnership, as Velazquez et al. ([4]; p, 812) explains:

**Table 3.** Definitions of the term sustainable campus.

Description	Sources
Explicit recognition of an institution’s central role in the degradation or support of the ecological, cultural, and economic fibre of our planet and our species	Shriberg (2002)
A strategy to improve the sustainable performance of universities and increase awareness among employees and students about sustainability and related issues	Environmental and Social Justice Action Research Group (ESJARG) (2013)
A campus characterized by social and economic operations that promote the long-term survival of the environment and our own social structures	Abd-Razak et al. (2011)

“A higher educational institution, as a whole or as a part, that addresses, involves and promotes the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfil its functions of teaching, research, outreach and partnership, and stewardship in ways which help society make the transition to sustainable lifestyles.”

The definitions of campus sustainability suggest the potential benefits of pursuing strategies for transitioning toward sustainability, and many studies have outlined these possibilities. For instance, Breyman ([43]; p.87) argues that, “Universities have the resources, vision, opportunity and responsibility to lead themselves and their societies towards sustainability, one step at a time.” On the whole, most rationales for promoting sustainability at HEIs are based on the premise that universities are influential global institutions, with a great capacity to lead and an intrinsic responsibility to improve society, particularly in respect to:

- Expertise and capacity for affecting change;
- Social responsibility and ethical roles;
- Environmental and ecological impacts;
- Financial and reputational benefits.

In terms of operational activities, the 1994 Campus Earth Summit’s Blueprint for a Green Campus (Nixon, [44]) outlined ten recommendations for campus sustainability procedures. Held at Yale University, the Summit hosted more than 400 attendees from 22 countries. Participants drafted this set of sustainability recommendations for HEIs, and many leaders in the field of campus sustainability still use them to define campus sustainability:

1. Integrate environmental knowledge into all relevant disciplines;
2. Improve undergraduate environmental course offerings;
3. Provide opportunities for students to study campus and regional environmental issues;
4. Conduct campus environmental audits;



5. Institute environmentally responsible purchasing practices;
6. Reduce campus waste;
7. Maximise energy efficiency;
8. Prioritise environmental sustainability in campus land-use, transportation and planning;
9. Establish student environmental centres;
10. Support students who pursue environmentally responsible careers.

In order to embed sustainability principles within university FPM departments, Humblet et al. [45] suggest that sustainable campuses efforts should focus on energy efficiency, resource consumption and enhancing the quality of the built environment through sustainability education. These efforts also require the creation of healthy living and learning environments by establishing policies and regulations that encourage sustainability practices in daily activities and decision-making processes. Essentially, transitioning toward a sustainable campus requires a reduction of both on-campus and off-site environmental impacts that result from campus activities and operations, alongside raising environmental awareness within university communities [46].

### *2.3. The Role of University Facility and Project Management (FPM) Departments in the Design and Delivery of Campus Sustainability*

Sustainability approaches hold the potential to improve entire project life cycles, particularly in the operation and maintenance stages, which essentially link to the responsibilities of campus FPM departments. Facilities Management (FM) is necessary for building maintenance and management, the maintenance of air-conditioning and energy facilities, landscaping, waste management, administrative support services, financial management of building assets, IT services and transportation [8]. Jensen [47] points out that, over time, FM tasks have grown and now cover areas such as real estate development, short- and long-term building use and the provision of support systems and services.

These responsibilities and roles highlight a fundamentally important link between the facilities and the core activities in an organisation [48]. Furthermore, they implicitly suggest that the application of FM concentrates on supporting major operational processes and contributing to the accomplishment of organisational goals [49,50]. Project and facilities management has been described as a branch of management which interacts with various organisational components, such as individuals and groups within organisations and their properties and assets, and aims to provide services that support the operational activities of any organisation [51,52]. Then and Tan [53] state that facility managers should respond to changes in client requirements in physical facilities and support services in order to meet organisational strategies and goals. In addition, these managers should support and align their work with organisational activities, varying levels of organisational competencies, management approaches, leadership styles and external service providers.

In the context of HEIs, FPM departments are the main actors responsible for managing and controlling a range of campus activities, such as planning, construction, operations, maintenance and waste disposal [7]. Ancarani and Capaldo [8] assert that FPM departments at HEIs should take the lead in stewarding all campus resources and assets. Thus, facilities managers could take a significant role in appointing appropriate regulations and systems for strategic, tactical and operational systems [9]. In order to implement sustainability initiatives and practices at HEIs and stimulate innovative thinking in sustainability, facility and project managers should do the following according to Tertiary Education Facilities Management Association (TEFMA), [54]: (i) secure commitments from senior university management; (ii) find leaders at the senior level who support the shift; (iii) identify risks and priorities; (iv) set policies, objectives and targets (long- and short-term) in conjunction with stakeholders; (v) develop an implementation plan; (vi) allocate sufficient resources; and (vii) effectively communicate with all internal and external stakeholders. As a result, FPM decision makers can find it challenging to implement sustainability initiatives due to the complexity of management and governance systems at HEIs, as well as the intensity of their operations, maintenance activities and practices.

#### 2.4. Opportunities and Barriers to Adopting Sustainability at HEIs

As discussed previously, HEIs are complex organisations characterised by diffuse hierarchical structures [55]. However, sustainability can be considered as a framework to promote the transition of institutional progress by incorporating its key principles into a university's policies and actions. Even if universities are mostly defined as institutions characterised by discrepancies and paradoxes, this does not necessarily preclude the adoption of sustainability—conceptually and practically [56]. However, many have argued that the implementation of sustainability at HEIs faces serious individual and organisational constraints. This difficulty in adopting sustainability arises from several causes, including organisational structures, financial constraints, the independence of university entities and low accountability for operational practices [54]. These constraints may also include insufficient knowledge, inadequate engagement by the university community and stakeholders, undeveloped organisational structures and management commitments, and financial limitations [57].

According to Thomas [58] and Ferrer-Balas et al. [59], the support of senior management at HEIs, coupled with clear leadership, can lead to effective progress in the practical delivery of campus sustainability. As top-down management approaches are predominant at universities, senior management are arguably well situated to facilitate campus sustainability efforts by promoting its core principles as a university priority and involving different stakeholders [60,61]. Furthermore, the influence of senior management can lead to the establishment of sustainability offices within university hierarchies that can then allocate resources for sustainability initiatives, embrace cost-saving principles and potentially enhance the reputation of their institutions [59]. As Roos et al. ([62]; p.2) point out, the role of management in HEIs is critical in “the allocation of resources, strategic alignment, and the planning, implementation, and evaluation of activities.” It is posited that this enables HEIs to augment their ability to embrace environmental and sustainability issues, dealing with them strategically, rather than just in a routine, operational manner.

In developing countries, HEIs often experience challenges that influence their shift toward campus sustainability, such as unclear government regulations, a lack of sustainability policies, an absence of inclusion in strategic planning efforts, insufficient leadership, lack of financial resources and low stakeholder engagement [63]. Rwelamila and Purushottam [64] highlight a number of challenges to adopting campus sustainability measures in developing countries, including a lack of experience in sustainability, the inability to hire sustainability consultants, misunderstandings about the high initial costs and outcomes among senior management, complex operational issues and the lack of a skilled workforce.

Several studies have recommended various plans and strategies for managing the challenges of implementing sustainability initiatives at HEIs, including:

- Bringing stakeholder groups and individuals together (i.e., senior management, policy makers, academic and administrative staff, and students) through greater awareness of sustainability principles;
- Increasing participation through teaching and research practices;
- Reviews of policy and regulations, as well as developing sustainability policies;
- Incorporating sustainability into operational activities and allocating funding for such initiatives.

Recent research by Roos et al. [62] involved a cross-sectional survey study with public HEIs in Germany, Switzerland and Austria. The key findings of relevance to the current study include that (i) sustainability initiatives related to waste management tended to be consistently strong (successful) across the case study institutions. The authors correlate this to clear legal obligations surrounding the regulation of waste management by public firms and organizations. (ii) The need to translate HEI sustainability policy into achievable goals in order to steer the efforts of environmental officers, with an emphasis on enabling the evaluation of any initiatives established via monitoring systems. This, it is argued, should also include the appropriate allocation of fiscal resources to facilitate and enable the effective implementation of sustainability. (iii) The importance of key decision-makers and organizational leaders in driving forward the formulation and delivery of workable strategies for

implementing campus sustainability; and—following on from this—(iv) the essential role of engaging students and key staff across the institution (including in a voluntary and participatory manner) to support the sustainability decision-making and policy delivery process.

The research presented in this paper aims to examine the individual factors that influence the implementation of campus sustainability initiatives. As Garland et al. [65] suggest, the need for understanding the challenges and opportunities of individual factors within HEIs holds the capacity to influence, and ultimately lead to, the delivery and realisation of campus sustainability. This notion provides the basis for understanding the role that ‘change actors’ can have in mobilising the concept of sustainability from theory to practice, particularly in terms of its implementation.

### *2.5. Higher Education Institutions (HEIs) in Saudi Arabia*

Over the last decade, the Saudi higher education (HE) system has developed very quickly, and is still moving through numerous major reforms. HE in Saudi Arabia is a comparatively recent phenomenon, and its first university was established in 1957 [66]. Comparative growth statistics of the Saudi higher education sector show that the last decade has witnessed rapid growth in the number of Saudi universities, from eight in 2001 to 25 in 2011 [67]. Together, these universities house more than 440 colleges in over 70 cities, towns and villages throughout the 13 Saudi administrative provinces [66]. The impetus for this expansion occurred in the mid-1990s, when Saudi higher education institutions were not able to keep up with the increasing demands made on higher education, and thus were not able to mitigate urbanisation [66]. Therefore, the Saudi government set a national development plan to create new universities nationwide, based on population densities [68]. In 1990, there were seven public Saudi universities, and there are currently there are twenty-seven, along with nine private universities, making a total of thirty-six universities in the Kingdom that provide access to higher education for the majority of Saudi citizens [17]. The consequences of the growth of Saudi HEIs has led to increased demand for energy and housing for academic staff and students, as well as the increased consumption of natural resources and generation of waste.

### *2.6. Sustainability at Saudi HEIs*

Higher education institutions (HEIs) can contribute to achieving sustainability goals by adopting management systems that can decrease the environmental impacts of campus operational practices and activities and improve the performance of buildings and their energy, waste and transportation systems. Saudi HEIs substantially lag behind in implementing sustainability initiatives compared with other universities worldwide [68]. In addition, limited knowledge and research on campus sustainability exists for Saudi Arabia, with only three evidential examples of HEIs in the Kingdom showing any real signs of progress in these regards to date.

One of those institutions, King Abdullah University of Science and Technology (KAUST), was designed and built according to several sustainability principles: 75% of its building materials are recycled, their designs using natural lighting and ventilation to increase energy efficiency, and they contain waste composting and recycling systems. In addition, the university’s main academic building was awarded a platinum rating from the U.S. Green Building Council’s (USGBC) Leadership in Energy and Environment Design (LEED) certification system. In terms of academic inquiry, KAUST also promotes research in renewable energy and environmental initiatives.

Several researchers and practitioners have conducted empirical studies on campus sustainability at Saudi HEIs, focusing on a variety of dimensions. For example, Abubakar et al. [69] evaluated student perceptions and awareness about three campus sustainability components: curriculum and research, campus operations, and community involvement. The study surveyed students at the University of Dammam’s College of Architecture and Planning, where some courses related to environmental sustainability are taught, and thus student attitudes were expected to be better in relation to the design and planning of sustainable environments. The key finding of this study was that, despite the considerable knowledge about environmental sustainability found among the participants, they largely showed a

general lack of interest and willingness to participate in campus sustainability initiatives. With respect to the curriculum, respondents indicated a low level of integration of sustainability concepts in their courses and research, and in terms of campus operational activities and practices, students reported the existence of a few sustainability initiatives (e.g., sustainable transportation and reduced energy and water use programmes) but a lack of sustainable landscaping and waste recycling practices. As a result, the author concluded the importance of transforming Saudi HEIs into sustainable campuses in order to become role models for other organisations. In addition, Abubaker et al. [69] argue that such a shift could facilitate the achievement of the third and tenth goals of the Kingdom's current five-year national development plan, which concern sustainable development and environmental resource protection.

In a separate study, Alshuwaikhat et al. [16] explored the level of sustainability integration within Saudi public HEIs. The findings showed that Saudi HEIs are relatively unsuccessful in integrating sustainability principles into their campus operations, with the participating HEIs showing a general lack of commitment to common operational and maintenance practices for saving energy and resources, as well as reducing waste (for example, most had yet to employ high efficiency air-conditioning and lightning systems, and set standards for energy use). The results suggest that Saudi universities require on-campus sustainability initiatives to enhance the efficiency and performance of buildings through the adoption of automation and control system technologies and renewable energy initiatives. In addition, the study noted that securing sufficient financial support for campus sustainability initiatives at Saudi HEIs is one of the key challenges that universities face.

While these studies offer insights into the situation of Saudi HEIs in terms of incorporating sustainability into their mainstream thinking and practices, it should be noted that they used relatively broad questionnaire approaches and collected few details about the views and perspectives of the main decision-makers at these institutions. A core aim of the research reported in this paper is to provide greater depth of understanding about campus sustainability planning and implementation by exploring the influence of decisions—and the people responsible for taking them—(i.e., those made within Facilities and Project Management departments), in a Saudi-specific context.

### *2.7. Use of Rational Choice Theory*

In order to gain a better understanding of the influence of decision makers within FPM departments with respect to promoting and establishing campus sustainability initiatives, the following key points were derived from the literature on rational choice theory (RCT). One of the primary principles of RCT is that individuals and decision makers are driven by a logic and rationality that guides their decisions regarding the outcomes that will result from their actions [70]. For this study, RCT was employed to investigate the influence of social interactions and the outcomes of individual decisions [71,72]. However, the actions and decisions of individuals are also influenced by limitations and boundaries such as beliefs, knowledge, time and budgets, and more broadly by organisational arrangements and structural environments [73]. The following points will be returned to—and discussed in depth—during the Discussion section of the paper (Section 5), with specific reference to the principles of RCT:

- i. The perceptions and knowledge of decision makers within FPM departments with respect to sustainability, and how they influence their decisions;
- ii. The effect of the existing sustainability interests and preferences of FPM decision makers on their decisions, and to what extent this is compatible with the desires and preferences of senior university management with respect to environmental and sustainability issues;
- iii. The influence of cost and other constraints that FPM decision makers face with respect to the delivery of plans and strategies for the establishment and promotion of campus sustainability initiatives.

### 3. Research Method

This research began by exploring the factors that influence FPM decision makers in appreciating the relevance of sustainability, such as their perceptions and knowledge, preferences and interests, the level of priority that they attach to sustainability and the impact of cost and other constraints. Before undertaking the semi-structured interviews, the researcher contacted 17 public universities and 41 individuals across Saudi Arabia through phone calls and personal visits to ensure the access to the targeted interviewees and their ability to participate in this research study. This was done to negotiate for access and participation among the targeted interviewees. However, the response rate was 18 individuals from 8 institutions. Consequently, in the initial stages of the research, an exploratory approach was adopted, focusing on eight Saudi universities and involving the administration of 18 semi-structured interviews with participants working in FPM departments routinely involved with delivering and managing campus projects and facilities. For its second phase, a case study approach was utilized, centering on three of the initial eight universities, involving the administration of a further 19 semi-structured interviews (see Table 4) with a sample of decision maker participants, alongside document analysis. The interviews were carried out between June and November 2016.

**Table 4.** Number of cases and participants' information.

Cases	Interviewee Code	Position	Qualification	Area of Expertise
Case AU	AU1.1	Director of sustainability department/academic	PhD	Architectural design
	AU1.2	Deputy director of sustainability department	BSc	Architecture
	AU1.3	Director of studies and design department/academic	PhD	Architectural design
	AU1.4	Deputy director of project management/academic	PhD	Industrial engineering
	AU1.5	General supervisor of strategic planning department/academic	PhD	Computer engineering
	AU1.6	Former director of studies and design/academic	PhD	Built environment
	AU1.7	Deputy director of operation and maintenance department	BSc	Mechanical engineering
Case UU	UU2.1	Director of studies and design department/academic	PhD	Architectural design
	UU2.2	Designer in the department of studies and design/academic	PhD	Architectural design
	UU2.3	Vice chancellor of facilities and projects/academic	PhD	Mechanical engineering
	UU2.4	Consultant working with FPM at UU	PhD	Architectural design
	UU2.5	Director of innovation centre/ works with strategic planning department/academic	PhD	Computer engineering
	UU2.6	Deputy director of studies and design department	BSc	Architecture
	UU2.7	Former director of project management department/academic	PhD	Architectural design
	UU2.8	Consultant working with FPM at UU/academic	PhD	Architectural design
Case BU	BU3.1	General supervisor of renewable energy project/academic	PhD	Civil engineering
	BU3.2	General supervisor of facilities and projects department/academic	PhD	Mechanical engineering
	BU3.3	Consultant working with FPM department at BU	BSc	Architecture
	BU3.4	Director of operation and maintenance department	BSc	Civil engineering

The use of a case study approach was justified on several grounds. For this study, incremental changes of social patterns in Saudi Arabia—particularly in terms of education and daily practices—would be of central importance to the objective of exploring university decision makers’ perspectives on the design and implementation of campus sustainability initiatives. Additionally, the concept of enacting sustainability measures in HEIs can be characterised as research and development initiatives that are well suited to the examination of case studies that investigate and appraise the complexity of human practices and actions within their social context [74]. Case studies afforded the ability to assess decision-making complexity regarding a series of ongoing, actual HEI situations, thus providing the opportunity to tease out the practical daily challenges facing HEI decision-makers, particularly in relation to the prioritisation of actions and cost constraints [75,76].

The selection of the three case studies involved the initial assessment of the original eight universities, in order to arrive at a sample that comprised different stages of development and existence. For the purpose of the results section, the names of the universities in question have been anonymously acronymized (as Case BU, Case UU and Case AU) (see Table 5). The initial exploratory phase helped to confirm that, in Saudi Arabia, HEIs can generally be classified into three main categories: (1) well-established institutions; (2) affiliated institutions that later became independent; and (3) emerging institutions. The data sources consisted of documents, reports and the interview responses of decision makers and administrators within FPM departments within the three university campuses being studied.

**Table 5.** Case study universities: descriptive statistics.

	Age	Area (Hectare)	Employee/Student Numbers	Faculties	Academic Programs (Undergraduate, Masters, PhDs)	Operational Budget (Government Funding)
AU	50 years	850	7000/95,000	24	120/85/40	£1.200.200.000
UU	36 years	1500	6000/80,000	25	150/60/44	£630.500.000
BU	11 years	770	2000/24,000	11	41/12/0	£220.400.000

In the initial (exploratory) phase, the interviews focused on three main areas: (1) decision-making processes with respect to environmental sustainability; (2) decision-making processes relating to sustainable construction projects; and (3) understanding the status of current environmental performance at Saudi HEIs. This helped in exploring the level of planning and action on sustainability from the perspective of FPM departments and narrowing down the research scope. In addition, it assisted in categorising the case study universities based on factors such as the extent to which sustainability is incorporated into their decision-making processes, and their historical backgrounds. The data gathered was used to inform the selection of the three main case study universities which were suitable for investigating campus sustainability issues in detail.

The main phase interviews focused on the level of planning and action for sustainability across the three selected case studies by exploring the influence of the perceptions and knowledge of FPM decision makers on sustainability, their interests and preferences. Costs and other constraints were examined in depth to understand their effect on implementing campus sustainability initiatives.

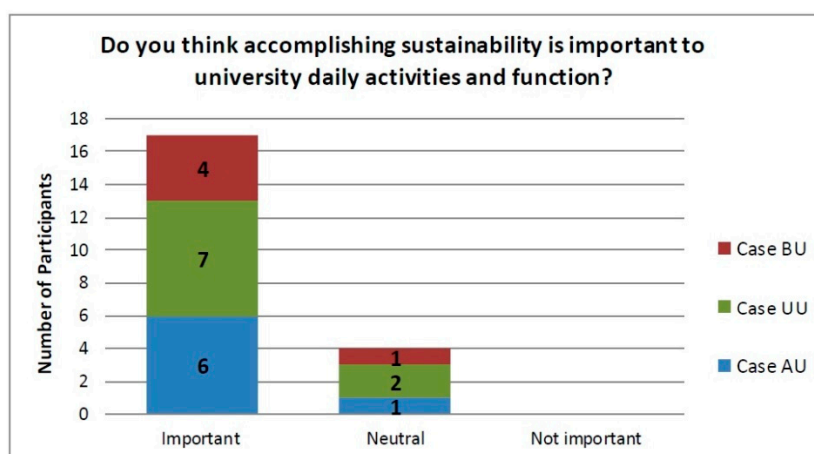
#### *Sample and Data Collection*

The study population comprised decision makers in various positions in the FPM departments of the case study universities, including people with decision-making responsibility for design, project management, operation, and maintenance and sustainability. Additionally, a small number of academics with experience in university built environment projects and sustainability were also invited to participate. Selecting interview participants for the case studies depended partly on the data analysis of the first exploratory phase of interviews. A purposive sampling approach was used to select the participants. This is a non-probability sampling procedure that is employed in qualitative research to select interview participants based on their knowledge [77]. The semi-structured interview

protocol comprised a range of different question ‘types’ (open-ended, scale item and closed questions) arranged into a thematic structure that included sections on participant environmental/sustainability attitudes and awareness, current university sustainability practices and visions for the future.

#### 4. Results

The majority of interview participants believed that taking note of—and implementing—sustainability is important to the daily activities and functioning of their universities (see Figure 1). All participants articulated an understanding of the role of HEIs regarding their potential for enabling the principles of sustainability to be established. For example, many participants expressed the belief that HEIs have a responsibility to encourage change, potentially in terms of creating educational models. While the perceptions stated by most participants align broadly with the main three pillars of sustainability, there was nevertheless considerable variation evident in the level of their conceptual understanding of the term. Not all participants, for example, assigned equal importance to all three facets of the term; some prioritised economic factors over the environmental and social ones, and vice versa. In addition, for those participants who identified the importance of environmental sustainability and its role in maintaining and preserving natural resources, very little attention was given to the role or benefits of sustainability with respect to social factors.



**Figure 1.** Responses to the question: “Do you think accomplishing sustainability is important to university daily activities and function?”

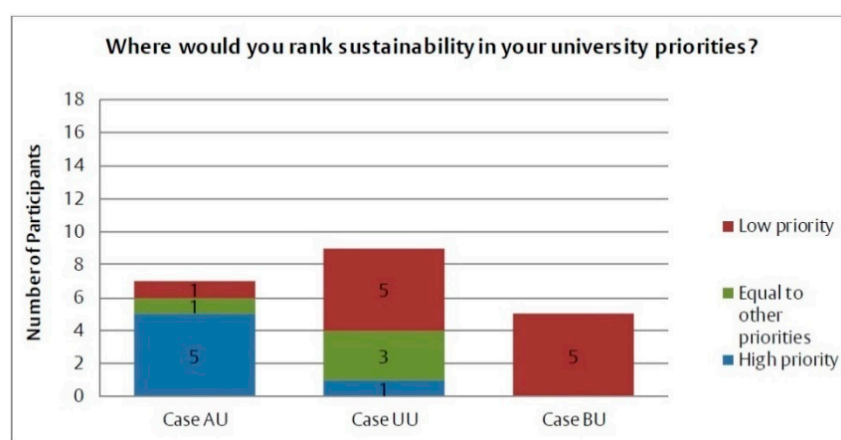
The interview results are consistent with many benefits that appear in the literature in relation to implementing sustainability. Some interviewees interpreted the importance of adopting sustainability by highlighting water and energy efficiency as the most prominent benefits. Others stressed alternative environmental factors and social and economic outcomes. Many participants identified that one of the top advantages of adopting sustainability on university campuses concerns financial factors. For example, incorporating sustainability into mainstream thinking and action on university campuses can lead to substantial reductions in energy consumption, which could positively influence the use of oil and petroleum products. Reducing operational and maintenance costs was another factor that a majority of participants identified.

Most of the participants stated that their support for the implementation of sustainability and other environmental practices within the university campus system stems, in large part, from their belief that these practices could lead to increased environmental awareness and could change the culture among the university community. Establishing an environmentally ‘aware’ culture and value system could potentially encourage students to keep practicing and observing sustainability in their lives.

Overall, the top advantages related to implementing sustainability practices and activities cited by the interviewees included: (i) cost saving; (ii) preserving surrounding environments and natural resources; and (iii) the potential to realise an attractive and distinctive place where a pro-environmental

ethos goes hand-in-hand with quality and performance. Interviewees also identified other motivations, such as increasing user productivity, providing demonstration models for other organisations, reducing energy consumption and creating positive examples for university stakeholders. However, it was stated by several participants that accomplishing the potential sustainability benefits would require more attention regarding the decision-making process and the level of priority given to sustainability as a core issue.

Planning and action on sustainability as a priority was addressed across the three case study universities. Participants' statements reflected that the level of recognising and acting on sustainability as a strategic priority varies among FPM decision makers and senior management within their respective universities (see Figure 2). The variation in the level of prioritising sustainability seems to signal that there are some important motivational factors that can enable or inhibit the adoption of sustainability in Saudi universities, including, not least, the desires and preferences of FPM decision makers and senior administration.



**Figure 2.** The level of sustainability prioritisation across case study campuses.

#### 4.1. The Influence of Decision Makers' Preferences and Interests

There was consensus among most interviewees from AU and UU, and some from BU, that ongoing efforts are actively made to incorporate sustainability during their decision-making processes. However, many participants stated that other factors play large roles in shaping the preferences of decision makers within their respective FPM departments, such as the general orientation of senior management within universities, the preferences and backgrounds of others involved in decision-making processes, and the level of priority given to sustainability-related issues. In addition, most of the participants referred to another significant factor that often influences decision makers' preferences: the costs associated with adopting and establishing sustainability initiatives, which is linked with a lack of policies and strategies to support their implementation. Such factors significantly influence the choices of FPM decision makers, and these can conflict with those of senior management, which has been shown to be particularly pertinent at UU and BU. As a result, previous factors (e.g., prioritising sustainability within the institution, the additional cost and the lack of sustainability policies and legislations) are somehow inseparable and work alongside the interests and preferences of FPM decision makers during the decision-making process, which in turn affect final decisions and the trade-off between available alternatives.

It is clear from the interview data that the preferences and interests of decision makers within university FPM departments towards sustainability are often expressed differently. Most interviewees stressed that sustainability is one of their preferences, but other factors, such as the decision-making process, knowledge, compliance with university regulations, the interests of senior management and other decision makers, and cost, are equally influential in shaping their choices. However, participants articulated their preferences largely based on their current situations in terms of integrating and implementing sustainability, how their universities prioritise sustainability, and the inspiration



from senior management and government, all of which highlight a clear variation between participants' preferences. Most of the decision makers within FPM departments at AU identified sustainability as being an important factor in their decision-making processes, with support from their sustainability departments and senior management positively driving decision FPM makers' preferences toward sustainability. By contrast, at UU, decision makers' interests in adopting sustainability depended largely on their own motivations, with less evidence of support from leaders in top-level positions. At BU, decision makers' preferences regarding sustainability appear to compete with those of some of its internal authorities and external bodies.

#### *4.2. Issues of Cost in Influencing and Restricting Sustainability Decision-Making*

Cost is a critical factor that profoundly influences university decision-making processes. Participants across all of the case studies stressed the significant impact that budgets play in planning and action on the design and delivery of sustainability initiatives. The lack of financial resources was highlighted as a major restraining factor in this regard. In the case of BU, implementing sustainability requires robust moral and financial support, and decision makers cannot move forward without this support. The UU case exhibited some similarities. For instance, some project proposals that include sustainability were rejected by FPM decision makers, and it was reported that senior management reject many project proposals (e.g., the proposal of replacing streetlight incandescent lighting fixtures with systems that use LEDs system), often due to the higher costs involved.

The lack of financial incentives for sustainability associated with uncertainty and risks for implementing initiatives are also factors that influence decision makers' choices and decisions. Furthermore, decision makers within Saudi public university FPM departments usually follow the common, prevailing procedure of selecting projects based on the lowest bid. This approach indicates that cost is an influential factor which affects the decision-making process for sustainability. Therefore, it is essential to convince FPM decision makers and senior management by providing cost-effectiveness or cost-benefits analysis as a strategy to demonstrate the benefits of implementing sustainability over the mid-long term, and to emphasise that operational savings hold the potential to pay back these high upfront costs.

#### *4.3. Supportive Policies and Strategies for Implementing Sustainability*

The absence of a comprehensive framework for environmental/sustainability policies at the broader Saudi national government level currently does not give a strong signal to universities in how they should address, design or implement their own sustainability strategies. It is interesting to note, following on from this, that the majority of interview participants taking part in this study stressed that, although government policymakers nominally support sustainable development (such as water management and insulation), there is in practice a wide variation in how these policies are actually delivered. It was argued that a more coherent national government stance on these issues would help to promote the more widespread adoption of sustainability in universities across the country.

Overall, the case study campuses currently lack a robust and extensive range of policies that hold the ability to deliver and implement sustainability. Many interviewees suggested that their university senior management need to become more familiar with the benefits of sustainability, and should invest in environmental and sustainable initiatives and incorporate sustainability in their day-to-day activities, curriculums and research. It was recognised by most participants that formulating and introducing policies and strategies for sustainability by senior management and FPM personnel could contribute tangibly towards the delivery of strategies and initiatives in day-to-day practices across the university campus. This was seen potentially as a powerful driver for change towards sustainability, which aligns with Cheeseman et al. [78], who argued that university policies and regulations can constitute a productive path to fostering sustainability strategies and initiatives.

## 5. Discussion

### 5.1. *The Level of Sustainability-Related Perceptions and Knowledge of Decision Makers within FPM Departments*

As a whole, FPM decision makers across all case study universities demonstrated some level of awareness of environmental and sustainability-related issues, and indicated familiarity with the potential benefits of implementing sustainability initiatives. A majority of participants described these benefits in relation to environmental advantages (e.g., the minimisation of negative environmental footprints, enhancement of operational and maintenance performance, and creation of a healthy environment that could increase user productivity).

However, not all participants assigned equal importance to all three main sustainability ‘pillars’ (i.e., social, environmental and economic). Some emphasised or prioritised the environmental implications of sustainability over the economic and social factors, while others prioritised social and economic issues. This may be linked to the reality that FPM decision makers across the case studies held different perceptions of precisely how sustainability is defined and how it could or should be integrated into their institutions. Sibbel [79] discussed this varying range of understanding and knowledge of the concept of sustainability, and suggested that education, experience, values, attitudes and beliefs can influence the cognition of decision makers. His standpoint—taken together with the evidence collected for this study—suggests that senior managers and decision makers within FPM could selectively respond to available choices and alternatives depending on their personal experiences, knowledge and interests.

Similarly, from a rational choice perspective, it seems that cognitive biases in decision-making processes can substantively impact the perceived value of incorporating sustainability into university projects when all of the three pillars are not fully conceptualized and deliberated alongside the influence of the prevailing senior management culture. In all of the case studies, the perceptions and knowledge of the interviewees strongly indicate that they hold broadly positive attitudes toward sustainability. This indicates that FPM decision makers are willing—and have the capacity—to adopt new knowledge and practices that could lead to the effective implementation of sustainability initiatives on their campuses. However, as noted previously, there are many instances in which this zeal for change has been thwarted by the apathy of senior management and the prioritisation of core decision-making issues other than sustainability. This line of reasoning could partially explain why AU has been able to make relatively more progress in implementing sustainability initiatives, while UU and BU have lagged behind in terms of their sustainability planning.

The data show that positive outcomes of sustainability for FPM decision makers required more cognitive effort to broaden their understanding and knowledge about a comprehensive meaning of sustainability, rather than direct linkages to factors such as reduced costs and other environmental issues, which could in turn lead to an increase in the level of sustainability incorporation in decision-making processes. As McKeown and Hopkins [80] argue, from an RCT perspective, broadening an understanding of sustainability by demonstrating the ways in which environmental issues are essentially interlinked with social and economic factors could enhance the level of recognition of the salience of sustainability issues. Furthermore, Flannery and May [81] suggest that one of the factors that compels institutions to implement sustainability is largely attributed to broadening individual knowledge, interests and attitudes. The study findings reflect this notion, in that the level of sustainability knowledge and interests among some of AU’s decision makers and senior management has inspired them to incorporate and integrate sustainability in their decision-making processes. By contrast, the relative lack of sustainability knowledge and interest among decision makers and senior management at UU and BU has generally hindered the adoption of sustainability initiatives.

Overall, the findings suggest that implementing sustainability initiatives at the case study universities would require broad educational and awareness interventions for senior management and decision makers at different levels in order to enhance their decision-making capacities.

The findings also signpost the potential importance of establishing sustainability awareness campaigns in order to increase awareness and define sustainability meaningfully for various stakeholders (e.g., senior management, decision makers and academic and administrative staff). As Hoover and Harder [82] report, increasing awareness among stakeholders can help shape the development of practices and structures within institutions over the short and long term. By contrast, a lack of institutional awareness of sustainability can impede sustainability initiatives or limit their reach.

### *5.2. The Influence of Interests and Preferences on Decisions*

Zajonc and Markus [83] state that, during decision-making processes, preferences for common options often play a role in shaping policies—whether or not individuals are familiar with the full range of options available. In addition, cognitive responses tend to vary due to factors such as education, beliefs, awareness and background. For this study, the findings suggest that, among available alternatives, a majority of decision makers within FPM departments considered sustainability to be one of their interests. However, other key factors affected and informed their decisions, including the preferences of senior management, the institutional culture of other decision makers and the prevailing decision-making processes. For this research, the generally weak interests of FPM decision makers and the conflict of interests and preferences between senior management and FPM decision makers made any trade-offs between alternatives and choices very explicit, particularly in cases AU and UU. For example, the interests of FPM decision makers at case AU were largely consistent with the priorities of its senior management, and thus tended to support the implementation of sustainability. By contrast, in cases UU and BU, conflicts in the interests, preferences and priorities between FPM decision makers and senior management tended to constrain the planning and action on sustainability initiatives in decision-making processes. This suggests that disagreement in the priorities of senior management and FPM decision makers, coupled with limited knowledge about sustainability, could constrain FPM decision makers in the design and delivery of sustainability initiatives. As Blanco-Portela et al. [84] noted, a lack of sustainability knowledge, insufficient information and low priorities were critical factors that influenced the decisions of senior management and decision makers to incorporate it their decisions and choices.

### *5.3. The Influence of Cost Constraints and Institutional Will*

Cost concerns clearly came across as a significant factor that influences the interests of FPM decision makers, and was identified as one of the key factors that shapes and guides their decisions. The data showed that decisions about implementing sustainability initiatives often have major consequences, and that one primary concern is the additional costs of such practices. The study findings revealed a number of cost-related issues, such as the generally higher cost of sustainability initiatives, the dominant procedure of tendering university projects based on the lowest bid, the budget allocation process, and the lack of policies and incentives that foster the implementation of sustainability.

In terms of RCT, individuals tend to maximise the benefits and minimise the costs of different courses of action [70–72,85]. According to Sexton et al. [86], cost–benefit and cost–effectiveness analyses sometimes include values for nonmarket goods and services, such as recreational value and improved water and air quality. Furthermore, Randall [87] states that the use of cost–benefit analyses in environmental decision-making processes is seen as a practical approach to discerning whether proposed decisions would increase satisfaction in terms of interests and preferences. There was a broad range of stakeholders included in the study (i.e., FPM decision makers, senior management, and members of the Ministries of Education and Finance), with a common level of relative unfamiliarity amongst senior management and other decision makers with many sustainability metrics. As a result, conflicts and misunderstandings often arose about the purpose of implementing sustainability initiatives. The data suggest that senior management and FPM decision makers nearly always approach decisions from a short-term cost perspective, and generally do not take account of long run cost-effectiveness or cost benefit analyses, which could influence environmental and sustainability choices. Such findings

further suggest that FPM decision makers should follow the conclusions of Kontoleon et al. [88], who state that cost–benefit analyses provide information about alternatives to decision makers, and should be considered as an advisory contribution in many decision-making processes.

## 6. Conclusions

Research on sustainability generally in HEIs is relatively new, and has been carried out predominantly over the last two decades. The published literature tends to debate the incentives and benefits for incorporating sustainability into universities' practices and activities, obstacles to integrating sustainability, and general strategies and recommendations. Most of this has concentrated on HEIs in Western nations. By contrast, there is a notable lack of published literature and academic studies relating to campus sustainability in Saudi Arabia, specifically in relation to exploring the fundamental issues around decision making and organisational settings. The research reported in this paper makes several important contributions to the current body of academic knowledge relating to campus sustainability in HEIs—particularly regarding the Saudi context. Firstly, it contributes to the expansion of literature around campus sustainability that relates to the area of decision-making and levels of understanding in respect to the attitudes of decision makers themselves. Key in this regard are the beliefs and thoughts towards implementing particular initiatives, along with the influence of FPM decision makers and organisational drivers/constraints present in Saudi universities. The identification of opportunities and challenges related to the delivery and mobilisation of on-campus sustainability in Saudi Arabia revealed existing gaps for the future implementation of sustainability principles and the critical factors that influence decision makers within FPM departments.

Secondly, the research confirms that supportive leadership and commitment as a decision-oriented factor can—and often does—play an influential role in facilitating the implementation of sustainability. Walton and Galea [89] emphasise that most of the HEI activities that have been previously explored are managed by individuals or groups in positions of leadership and influence who could potentially assist in the implementation of campus sustainability initiatives. For instance, in many developing countries, HEIs often experience challenges that influence their shift toward campus sustainability, such as unclear government regulations, a lack of sustainability policies, the absence of inclusion in strategic planning efforts, insufficient leadership, lack of financial resources and low stakeholder engagement [63]. Indeed, the current study shows that strong leadership is essential in promoting sustainability awareness among senior management and decision makers, and with respect to introducing sustainability policies that could help place sustainability among core university priorities, which appeared very clearly in one of the case studies examined. Furthermore, such leadership could lead more directly to the provision of both financial and moral support, which are essential in terms of establishing effective sustainability initiatives.

Third, the study demonstrates that cost will (more often than not) be the overriding factor of importance when it comes to designing and delivering any form of project across a university campus—a point which was emphasized many times by the majority of study participants. Even though cost is the key factor, it does not mean by default that other considerations cannot be integrated into the design and delivery of the projects, including elements that enable projects to have a minimal environmental impact and are able to exert a positive effect in relation to social, economic and environmental sustainability.

The implications of this paper are three-fold. Primarily, the involvement of all influential stakeholders, including decision makers and senior management with expertise, is essential. The results demonstrated with clarity that it is vital to include all of the influential decision makers and senior management in larger discussions, even if planning and actions are ultimately taken by a much smaller group of employees in the university. If decision makers and senior management are not involved fully in the initial discussions and formulation of ideas and plans, they are less likely to include sustainability as either a high priority issue, a core responsibility or a necessary set of activities to be incorporated into daily routine activities and actions. Secondly, commitment to sustainability

needs to be institutionalised in order to deal with the range of challenges that impact upon the incorporation of ‘new’ ideas into mainstream thinking and practice. Therefore, adopting sustainability needs to incorporate organisational changes that become integral to the campus, such as creating a sustainability department, developing policy for sustainability and including sustainability in vision and objectives statements, all of which are associated with increasing the potential for enabling campus sustainability to materialize. Lastly, it would clearly be challenging to suddenly and absolutely adopt sustainability into the operations of HEIs where little thought or priority had been given to these issues heretofore. The findings of this study indicate that, although sustainability was personally important to FPM decision makers, many still do not consider it central to their work or professional activities. Therefore, promotion of funding and opportunities for campus sustainability seems essential—as well as encouraging FPM staff to become more fully engaged in the decision-making and planning processes in this area.

Nowadays, the Saudi Government’s ‘2030 vision’ comprises a number of strategies that are designed to promote sustainability issues, such as environmental protection, the sustainable utilization of natural resources, improved waste management practices and pollution reduction. In general, the strategic vision focuses on delivering in three core areas: a vibrant society, a thriving economy and an ambitious nation. The plans outline strategies to promote sustainability issues, such as cleaner environments, waste and pollution reduction, governance and management policies, and investments in renewable energy sources. Such plans may hopefully motivate Saudi HEIs to move toward campus sustainability by helping them develop clearer, pragmatic policies and strategies—and by assigning financial resources, which the present paper posits would support HEIs in the consideration and implementation of effective campus sustainability initiatives.

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## References

1. Alshuwaikhat, H.M.; Abubakar, I. An integrated approach to achieving campus sustainability: Assessment of the current campus environmental management practices. *J. Clean. Prod.* **2008**, *16*, 1777–1785. [[CrossRef](#)]
2. Taleb, H.; Al-Saleh, Y. Evaluating economic and environmental benefits of integrating solar photovoltaics within future residential buildings in Saudi Arabia. *J. Energy Power Eng.* **2010**, *4*, 18–25.
3. Grindsted, T.S. Sustainable universities—from declarations on sustainability in higher education to national law. *Environ. Econ.* **2011**, *2*, 29–36. [[CrossRef](#)]
4. Velazquez, L.; Munguia, N.; Platt, A.; Taddei, J. Sustainable university: What can be the matter? *J. Clean. Prod.* **2006**, *14*, 810–819. [[CrossRef](#)]
5. Orr, D.W. *Earth in Mind: On Education, Environment, and the Human Prospect*; Island Press: Washington, DC, USA, 2004.
6. Bardaglio, P.W.; Putman, A. *Boldly Sustainable: Hope and Opportunity for Higher Education in the Age of Climate Change*; NACUBO: Washington, DC, USA, 2009.
7. Adams, G.K. Relating Facility Performance Indicators to Organizational Sustainability Performance in Public Higher Education Facilities. Ph.D. Thesis, Georgia Institute of Technology, Atlanta, GA, USA, 2010.
8. Ancarani, A.; Capaldo, G. Supporting decision-making process in facilities management services procurement: A methodological approach. *J. Purch. Supply Manag.* **2005**, *11*, 232–241. [[CrossRef](#)]
9. Shah, S. *Sustainable Practice for the Facilities Manager*; Blackwell Publ.: Oxford, UK; Malden, MA, USA, 2007.
10. Sharp, L. Green campuses: The road from little victories to systemic transformation. *Int. J. Sustain. High. Educ.* **2002**, *3*, 128–145. [[CrossRef](#)]
11. Hodges, C.P. A facility manager’s approach to sustainability. *J. Facil. Manag.* **2005**, *3*, 312–324. [[CrossRef](#)]

12. Yang, J.; Brandon, P.S.; Sidwell, A.C. *Smart and Sustainable Built Environments*; John Wiley & Sons: Hoboken, NJ, USA, 2008.
13. Elmualim, A.; Shockley, D.; Valle, R.; Ludlow, G.; Shah, S. Barriers and commitment of facilities management profession to the sustainability agenda. *Build. Environ.* **2010**, *45*, 58–64. [[CrossRef](#)]
14. Nielsen, S.B.; Jensen, J.O.; Jensen, P.A. Delivering sustainable facilities management in danish housing estates. In Proceedings of the CIMNE 2009 International Conference on Sustainability Measurement and Modelling, Barcelona, Spain, 5–6 November 2009.
15. Bosch, S.J.; Pearce, A.R. Sustainability in public facilities: Analysis of guidance documents. *J. Perform. Constr. Facil.* **2003**, *17*, 9–18. [[CrossRef](#)]
16. Alshuwaikhat, H.M.; Adenle, Y.A.; Saghir, B. Sustainability assessment of higher education institutions in saudi arabia. *Sustainability* **2016**, *8*, 750. [[CrossRef](#)]
17. Vaughter, P.; Wright, T.; McKenzie, M.; Lidstone, L. Greening the ivory tower: A review of educational research on sustainability in post-secondary education. *Sustainability* **2013**, *5*, 2252–2271. [[CrossRef](#)]
18. Hopkinson, P.; James, P. Whole institutional change towards sustainable universities—Bradford’s ecoversity initiative. In *The Sustainable University: Progress and Prospects*; Sterling, S., Maxey, L., Luna, H., Eds.; Routledge: London, UK, 2013; pp. 235–255.
19. Lidstone, L.; Wright, T.; Sherren, K. An analysis of canadian stars-rated higher education sustainability policies. *Environ. Dev. Sustain.* **2015**, *17*, 259–278. [[CrossRef](#)]
20. Leal Filho, W.; Manolas, E.; Pace, P. The future we want: Key issues on sustainable development in higher education after rio and the un decade of education for sustainable development. *Int. J. Sustain. High. Educ.* **2015**, *16*, 112–129. [[CrossRef](#)]
21. Vaughter, P.; McKenzie, M.; Lidstone, L.; Wright, T. Campus sustainability governance in canada: A content analysis of post-secondary institutions’ sustainability policies. *Int. J. Sustain. High. Educ.* **2016**, *17*, 16–39. [[CrossRef](#)]
22. Azizi, L.; Colin, B.; Remmer, S. Recent trends in sustainability reporting by German universities. *Nachhalt. Sustain. Manag. Forum* **2018**, *26*, 65–85. [[CrossRef](#)]
23. Leal Filho, W.; Emblen-Perry, K.; Molthan-Hill, P.; Mifsud, M.; Verhoef, L.; Azeiteiro, U.M.; Bacelar-Nicolau, P.; de Sousa, L.O.; Castro, P.; Beynaghi, A.; et al. Implementing Innovation on Environmental Sustainability at Universities Around the World. *Sustainability* **2019**, *11*, 3807. [[CrossRef](#)]
24. Wang, W.S.; Ching, G.S. Developing Sustainability Indicators for Higher Education Institutions in Taiwan. *Int. J. Inf. Educ. Technol.* **2015**, *5*, 905. [[CrossRef](#)]
25. UNESCO. Thessaloniki Declaration. In *International Conference on Environment and Society: Education and Public Awareness for Sustainability*; UNESCO: Paris, France, 1997. Available online: [http://portal.unesco.org/education/es/file\\_download.php/d400258bf583e49cd49ab70d6e7992f6Thessaloniki+declaration.doc](http://portal.unesco.org/education/es/file_download.php/d400258bf583e49cd49ab70d6e7992f6Thessaloniki+declaration.doc) (accessed on 16 February 2017).
26. UNCED. Promoting education and public awareness and training. In *United Nations Conference on Environment and Development*; UNCED: Rio de Janeiro, Brazil, 1992.
27. Shriberg, M. Institutional assessment tools for sustainability in higher education: Strengths, weaknesses, and implications for practice and theory. *High. Educ. Policy* **2002**, *15*, 153–167. [[CrossRef](#)]
28. Stephens, J.C.; Graham, A.C. Toward an empirical research agenda for sustainability in higher education: Exploring the transition management framework. *J. Clean. Prod.* **2010**, *18*, 611–618. [[CrossRef](#)]
29. Goni, F.A.; Muriati Sahran, S.; Shukor, S.A.; Chofreh, A.G. Aligning an information system strategy with sustainability strategy towards sustainable campus. In Proceedings of the 2013 International Conference on Research and Innovation in Information Systems (ICRIIS), Kuala Lumpur, Malaysia, 27–28 November 2013; pp. 245–250.
30. De Castro, R.; Jabbour, C.J.C. Evaluating sustainability of an indian university. *J. Clean. Prod.* **2013**, *61*, 54–58. [[CrossRef](#)]
31. Wright, T.S.A. Giving “teeth” to an environmental policy: A delphi study at dalhousie university. *J. Clean. Prod.* **2006**, *14*, 761–768. [[CrossRef](#)]
32. Moganadas, S.R.; Corral-Verdugo, V.; Ramanathan, S. Toward systemic campus sustainability: Gauging dimensions of sustainable development via a motivational and perception-based approach. *Environ. Dev. Sustain.* **2013**, *15*, 1443. [[CrossRef](#)]

33. Wright, T. The evolution of sustainability declarations in higher education. In *Higher Education and the Challenge of Sustainability*; Corcoran, P., Wals, A., Eds.; Springer: Dordrecht, The Netherlands, 2004; pp. 7–19.
34. Wright, T. *Giving Teeth to a University Sustainability Policy: Using the Delphi Method to Develop a Meaningful Implementation Plan*; Environmental Management Sustainable Universities: Monterrey, Mexico, 2004.
35. Grindsted, T.S.; Holm, T. Thematic development of declarations on sustainability in higher education. *Environ. Econ.* **2012**, *3*, 32–40. [[CrossRef](#)]
36. Wright, T.S. Definitions and frameworks for environmental sustainability in higher education. *High. Educ. Policy* **2002**, *15*, 105–120. [[CrossRef](#)]
37. Alonso-Almeida, M.D.M.; Marimon, F.; Casani, F.; Rodriguez-Pomeda, J. Diffusion of sustainability reporting in universities: Current situation and future perspectives. *J. Clean. Prod.* **2014**, *106*, 144–154. [[CrossRef](#)]
38. Wright, T.S.; Wilton, H. Facilities management directors' conceptualizations of sustainability in higher education. *J. Clean. Prod.* **2012**, *31*, 118–125. [[CrossRef](#)]
39. Helvarg, D. Perception is reality: Greenwashing puts the best public face on corporate irresponsibility? *The Environmental Magazine*, November/December 1996.
40. Walton, J. Should monitoring be compulsory within voluntary environmental agreements? *Sustain. Dev.* **2000**, *8*, 146. [[CrossRef](#)]
41. Laroche, D.-C. *Tracking Progress: Development and Use of Sustainability Indicators in Campus Planning and Management*; Arizona State University: Tempe, AZ, USA, 2009.
42. Emanuel, R.; Adams, J. College students' perceptions of campus sustainability. *Int. J. Sustain. High. Educ.* **2011**, *12*, 79–92. [[CrossRef](#)]
43. Breyman, S. *Sustainability through Incremental Steps? The Case Study of Campus Greening at Rensselaer Sustainability and University Life*; Peter Lang: Frankfurt am Main, Germany, 1999.
44. Nixon, A. Improving the Campus Sustainability Assessment Process. Campus Sustainability Assessment Review Project. Bachelor's Thesis, Western Michigan University, Kalamazoo, MI, USA, 2002.
45. Humblet, E.M.; Owens, R.; Roy, L.P. *Roadmap to a Green Campus*; Green Building Council (USGBC): Washington, DC, USA, 2010.
46. Creighton, S.H. *Greening the Ivory Tower: Improving the Environmental Track Record of Universities, Colleges, and Other Institutions*; MIT Press: Cambridge, MA, USA, 1998.
47. Jensen, P.A. Design integration of facilities management: A challenge of knowledge transfer. *Archit. Eng. Des. Manag.* **2009**, *5*, 124–135. [[CrossRef](#)]
48. Kok, H.B.; Mobach, M.P.; Omta, O.S. The added value of facility management in the educational environment. *J. Facil. Manag.* **2011**, *9*, 249–265. [[CrossRef](#)]
49. Barrett, P.; Baldry, D. *Facilities Management: Towards Best Practice*; Blackwell: Oxford, UK, 2003.
50. Atkin, B.; Brooks, A. *Total Facilities Management*; Wiley-Blackwell: Oxford, UK, 2009.
51. Becker, F.D. *The Total Workplace: Facilities Management and the Elastic Organization*; Van Nostrand Reinhold: New York, NY, USA, 1991.
52. Then, D.S.S. An integrated resource management view of facilities management. *Facilities* **1999**, *17*, 462–469. [[CrossRef](#)]
53. Then, D.; Tan, T. Aligning facilities management performance to business needs—an exploratory model linking fm performance to business performance. In Proceedings of the Trondheim CIBW70 International Symposium—Changing Users Demands in Buildings, Trondheim, Norway, 12–14 June 2006; pp. 340–349.
54. Tertiary Education Facilities Management Association. *A Guide to Incorporating Sustainability into Facilities Management*; Tertiary Education Facilities Management Association (TEFMA): Queensland, Australia, 2004; p. 37.
55. Comm, C.L.; Mathaisel, D.F.X. A case study in applying lean sustainability concepts to universities. *Int. J. Sustain. High. Educ.* **2005**, *6*, 134–146. [[CrossRef](#)]
56. Adomssent, M.; Godemann, J.; Michelsen, G.; Adomssent, M.; Godemann, J.; Michelsen, G. Transferability of approaches to sustainable development at universities as a challenge. *Int. J. Sustain. High. Educ.* **2007**, *8*, 385–402. [[CrossRef](#)]
57. Evangelinos, K.I.; Jones, N.; Panoriou, E.M. Challenges and opportunities for sustainability in regional universities: A case study in mytilene, greece. *J. Clean. Prod.* **2009**, *17*, 1154–1161. [[CrossRef](#)]
58. Thomas, I. Sustainability in tertiary curricula: What is stopping it happening? *Int. J. Sustain. High. Educ.* **2004**, *5*, 33–47. [[CrossRef](#)]

59. Ferrer-Balas, D.; Adachi, J.; Banas, S.; Davidson, C.; Hoshikoshi, A.; Mishra, A.; Motodoa, Y.; Onga, M.; Ostwald, M. An international comparative analysis of sustainability transformation across seven universities. *Int. J. Sustain. High. Educ.* **2008**, *9*, 295–316. [[CrossRef](#)]
60. Saadatian, O.; Salleh, E.; Tahir, O.; Dola, K. Observations of sustainability practices in Malaysian research universities: Highlighting particular strengths. *Pertanika J. Soc. Sci. Humanit.* **2009**, *17*, 225–244.
61. Krizek, K.J.; Newport, D.; White, J.; Townsend, A.R. Higher education's sustainability imperative: How to practically respond? *Int. J. Sustain. High. Educ.* **2012**, *13*, 19–33. [[CrossRef](#)]
62. Roos, N.; Heinicke, X.; Guenther, E.; Guenther, T.W. The role of environmental management performance in higher education institutions. *Sustainability* **2020**, *12*, 655. [[CrossRef](#)]
63. Wang, Y.; Shi, H.; Sun, M.; Huisingh, D.; Hansson, L.; Wang, R. Moving towards an ecologically sound society? Starting from green universities and environmental higher education. *J. Clean. Prod.* **2013**, *61*, 1–5. [[CrossRef](#)]
64. Rwelamila, P.M.D.; Purushottam, N. Strategic project management as an innovative approach for sustainable green campus buildings in Africa: The need for a paradigm shift. *Smart Sustain. Built Environ.* **2016**, *5*, 261–271. [[CrossRef](#)]
65. Garland, N.; Hadfield, M.; Howarth, G.; Middleton, D. Investment in sustainable development: A UK perspective on the business and academic challenges. *Sustainability* **2009**, *1*, 1144–1160. [[CrossRef](#)]
66. Mazi, A.A.; Abouammoh, A.M. *Development of Higher Education in the Kingdom of Saudi Arabia: Trends and Strategies*; The Global Higher Education Forum GHEF09: Penang, Malaysia, 2009.
67. Al-Eisa, E.; Smith, L. Governance in Saudi higher education. In *Higher Education in Saudi Arabia*; Smith, L., Abouammoh, A., Eds.; Springer: London, UK, 2013; Volume 40, pp. 27–35.
68. Alshuwaikhat, H.M.; Mohammed, I. Sustainability matters in national development visions—evidence from Saudi Arabia's vision for 2030. *Sustainability* **2017**, *9*, 408. [[CrossRef](#)]
69. Abubakar, I.R.; Al-Shihri, F.S.; Ahmed, S.M. Students' assessment of campus sustainability at the university of Dammam, Saudi Arabia. *Sustainability* **2016**, *8*, 59. [[CrossRef](#)]
70. Friedman, M. Essays in positive economics. In *The Methodology of Positive Economics*; Friedman, M., Ed.; The University of Chicago Press: Chicago, IL, USA, 1953; pp. 3–43.
71. Zey, M. *Rational Choice Theory and Organizational Theory: A Critique*; Sage Publications: London, UK, 1997.
72. Scott, W.R.; Davis, G.F. Organizations and organizing. In *Rational, Natural and Open Perspectives*; Pearson Prentice Hall: New York, NY, USA, 2007.
73. Voss, T.; Abraham, M. Rational choice theory in sociology: A survey. In *The International Handbook of Sociology*; Sage: London, UK, 2000; pp. 50–83.
74. Flick, U. *Qualitative Forschung—Theorie, Methoden, Anwendung in Psychologie und Sozialwissenschaften*; Rowohlt: Reinbek bei Hamburg, Germany, 1995.
75. Mayring, P. Qualitative content analysis. In *Forum: Qualitative Social Research*; Freie Universität Berlin: Berlin, Germany, 2000. Available online: <http://qualitative-research.net/fqs> (accessed on 28 November 2017).
76. Kyburz-Graber, R. Does case-study methodology lack rigour? The need for quality criteria for sound case study research, as illustrated by a recent case in secondary and higher education. *Environ. Educ. Res.* **2004**, *10*, 53–65. [[CrossRef](#)]
77. David, M.; Sutton, C.D. *Social Research: The Basics*; Sage: London, UK, 2004.
78. Cheeseman, A.; Wright, T.; Murray, J.; McKenzie, M. Taking stock of sustainability in higher education: A review of the policy literature. *Environ. Educ. Res.* **2019**, *25*, 1697–1712. [[CrossRef](#)]
79. Sibbel, A. Pathways towards sustainability through higher education. *Int. J. Sustain. High. Educ.* **2009**, *10*, 68–82. [[CrossRef](#)]
80. McKeown, R.; Hopkins, C. Eep esd: Defusing the worry. *Environ. Educ. Res.* **2003**, *9*, 117–128. [[CrossRef](#)]
81. Flannery, B.L.; May, D.R. Prominent factors influencing environmental activities: Application of the environmental leadership model (elm). *Leadersh. Q.* **1994**, *5*, 201–221. [[CrossRef](#)]
82. Hoover, E.; Harder, M.K. What lies beneath the surface? The hidden complexities of organizational change for sustainability in higher education. *J. Clean. Prod.* **2015**, *106*, 175–188. [[CrossRef](#)]
83. Zajonc, R.B.; Markus, H. Affective and cognitive factors in preferences. *J. Consum. Res.* **1982**, *9*, 123–131. [[CrossRef](#)]



84. Blanco-Portela, N.; Benayas, J.; Pertierra, L.R.; Lozano, R. Towards the integration of sustainability in higher education institutions: A review of drivers of and barriers to organisational change and their comparison against those found of companies. *J. Clean. Prod.* **2017**, *166*, 563–578. [[CrossRef](#)]
85. Coleman, J.S. *Foundations of Social Theory*; Harvard University Press: Cambridge, MA, USA, 1990.
86. Sexton, K.; Marcus, A.A.; Easter, K.W.; Burkhardt, T.D. *Better Environmental Decisions: Strategies for Governments, Businesses, and Communities*; Island Press: Washington, DC, USA, 1999.
87. Randall, A. *Benefit Cost Considerations Should Be Decisive When There Is Nothing More Important at Stake*; Blackwell Publishing: Oxford, UK, 2002.
88. Kontoleon, A.; Macrory, R.; Swanson, T. Individual preference-based values and environmental decision making: Should valuation have its day in court? In *An Introduction to the Law and Economics of Environmental Policy: Issues in Institutional Design*; Emerald Group Publishing Limited: Bingley, UK, 2002; pp. 177–214.
89. Walton, S.V.; Galea, C.E. Some considerations for applying business sustainability practices to campus environmental challenges. *Int. J. Sustain. High. Educ.* **2005**, *6*, 147–160. [[CrossRef](#)]



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