Yugoslav Journal of Operations Research
(20##), Number #, #-#
DOI: https://doi.org/10.2298/YJOR250515028A

Research article

PRIORITIZING SAUDIZATION POLICY INTERVENTIONS IN SAUDI ARABIA: AN INTEGRATED FUZZY AHP-VIKOR FRAMEWORK

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Received: May 2025 / Accepted: July 2025

Abstract: Saudi Arabia is proactively advancing its economic vision beyond traditional oil reliance, embracing diversification as a strategic national priority. Central to this transformation is the Saudization program, designed to empower Saudi nationals through increased workforce participation. This study introduces a novel hybrid FAHP-FVIKOR methodology to comprehensively evaluate revitalization strategies for the program. Our analysis identifies Youth Mobilization as the foremost policy approach, demonstrating exceptional potential to cultivate professional engagement among Saudi youth and strengthen national talent development. Recognized for its practical sustainability and synergistic integration with complementary initiatives, this policy fosters a dynamic framework for enhancing Saudization outcomes. By prioritizing youth empowerment and workforce activation, the policy significantly advances both Saudization objectives and the Kingdom's broader economic diversification goals. This research contributes pioneering insights into effective policy integration for sustainable economic development, employing advanced fuzzy MCDM techniques to support Saudi Arabia's forward-looking transformation.

Keywords: Saudization, Saudi Nationals, fuzzy AHP, fuzzy VIKOR, sustainability.

MSC: 90B50, 90C70, 91B06, 03B52, 68T37, 90B06, 91-08

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1. INTRODUCTION

Saudi Arabia, a country with richness in youth potential, now has a greater opportunity to enable its dynamic younger population through the establishment of unique employment initiatives. Over the years, Saudi Arabia has attempted to lower its unemployment levels through varying strategies [1]. In such a scenario, Saudi Arabia can adopt the prime example of Dubai, which has little oil in comparison but over the last 50 years the city has become a hub backed by a robust economy, leading it to become one of the most affluent cities not only in the UAE but globally [2]. To cater to the situation, the government has implemented Saudization to curtail the country's dependence on oil and an oil-based economy. The context can be clarified based on the scenario that the economies are facing in terms of socio-economic pressure and the ever-rising unemployment rate. Several countries have adopted such a system to ensure that the local population is preferred so that the overall balance of the society remains intact. In such cases, the Emiratization in the UAE's scenario or the Omanization in Oman, are examples of implementing wider nationalization efforts for the alignment of the local workforce with the national identity [3].

Saudization is the Saudi Nationalization Scheme better known in the Middle East as Nitaqat. It is a formal policy implemented by the Ministry of Labour (MoL), to increase the employment of Saudi nationals in the private sector [4]. Thus, companies operating in Saudi Arabia are required to hire Saudi Nationals on a quota basis with every Saudi being hired for every 10 expatriates. Furthermore, the companies are classified into four zones; red, green, platinum, and yellow, where the compliant zones are; platinum and green whereas the non-compliant zones are yellow and red, respectively. It is beneficial for companies to be within the green and platinum quotas to be granted benefits and incentives for preferring the local graduates and workforce [5].

Saudization is a concept that has been floating in and out since its initiation in 1985, however, accelerated in recent years with the implementation of Vision 2030. Redirecting oil revenues toward meaningful reforms aimed at enhancing social and economic conditions, enabling Saudi Arabia to productively leverage its growing youth population [6]. By the year 2023, the implementation of the Saudization project has set in motion the changes that are gradually shaping the overall employment and the landscape of the labor market [7]. Similarly, it must be mentioned that the Saudi nationals are getting benefits from the targeted training and education, enabling to be the drivers of the robust economic growth. Also, the continued reforms in the vocational training and the education are creating huge leaps towards preparing the Saudi youth with the market-ready skills [8]. In such a scenario, it must be noted that various private companies have different criteria to meet the wants and needs of the consumer and with the implementation of the Saudization, it is creating new opportunities for the collaboration in private sector to enable cost-effective hiring innovation and training models [9] [10].

Furthermore, the factors of the success for the Saudization are becoming clearer, with focus on the development of the skills, and strategic planning, along with the supportive socio-economic measures as the driving force [11]. Similarly, statistics from the Ministry of Labor indicate that between 2011 and 2014, the public sector created around 242,610 jobs, all designated for Saudi nationals, in addition to replacing 6,868 roles that were formerly occupied by expatriates. In comparison, back in 2014, the expatriates were still dominating the labor market of Saudi Arabia, as they occupied 75.2 percent of the jobs in the country [12]. Similarly, it must be mentioned that the composition of the private sector

depicts an opportunity for the national employment strategies and a way to expand the participation of the Saudi workforce [13].

According to targets set by the Ministry of Economy and Planning (MoEP) for the Saudization program in the Ninth Development Plan (NDP), with a 44.5% Saudization employment rate, the groundwork laid down by NDP shows subsequent plans to exceed future targets. It must be stated that since 2014, the journey to reduce Saudi unemployment has encouraged the policies to further accelerated the job creation program [14]. It must be mentioned that many researchers have since studied the effects of Saudization on various levels of aspects such as but not limited to the labor market, expatriates versus nationals, firms, and exports. Some even looked at its correlation with the new Saudi 2030 reforms and whether they are compatible or not. However, these studies have been looking at the short-term effects that have been achieved instantaneously since the policy implementation, and the current research aims to extend the positive impacts of the Saudization, in order to speed up the process of establishing a fast-paced economy.

Keeping the aforementioned discussion in mind, the current research study aims to explore several policies through Fuzzy Multi-Criteria Decision Making (FMCDM) methodologies where the policies would be ranked based on their effectiveness in revamping the Saudization program towards its success. Through this, we will be able to understand if other policies can be implemented alongside Saudization that would bring productive and lucrative change.

Firstly, the fuzzy set theory is utilized to address the uncertainty to ensure that irrefutable results are achieved by eliminating ambiguity in the decision-making process [15]. Fuzzy set theory then combines with the Analytic Hierarchy Process (FAHP) [16], so that the different policy evaluation criteria are weighted based on their importance in the pretext of revamping the Saudization program in the first step. Afterward, the criteria weights of the FAHP are incorporated into the Fuzzy VlseKriterijumska Optimizacija I Kompromisno Resenje (FVIKOR) [17] method to analyze top policies based on the distinct evaluation criteria.

1.1. Research Questions

Based on the aforementioned discussion, the current research tries to answer the following research questions. They are listed as follows;

1. What are the factors or evaluation metrics that can play a major role in the success of a policy?
2. What are the policies that can enable an efficient and effective implementation of the Saudization project with minimal risk so that the country can meet its targets?

The rest of the paper is arranged in the following manner. Section 2 gives a comprehensive review of the previous studies on Saudization and identifies the gap in the literature, while simultaneously discussing the novelty of this study. Section 3 gives a detailed explanation of the data collection process, while Section 4 converses on the methodology applied in this study. In Section 5 the results and discussion on the top-ranking policies are provided. Lastly, in Section 6 the conclusion of the study is given, by summarizing the findings and giving future recommendations for further studies.

2. LITERATURE REVIEW

Saudi Arabia's economic structure before the discovery of oil was limited as most of its economic revenue was solely brought in through pilgrimages to the holy city of Makkah [18]. They were heavily engaged in agriculture and herding when in 1938 an American-owned oil well company drilled and found one of the largest sources of oil in the world, which changed Saudi Arabia on a social, economic, and political level [19]. This movement from a nomadic agricultural lifestyle to now booming industrial country led to oil fulfilling more than 92% of Saudi Arabia's current budget [20].However, ironically the oil reserves are beginning to erode and a price fall in 2016 made it clear to the Saudi cabinet that changes must be brought to enhance the growth of the economy in the other sectors as well [21]. Therefore, a critical economic objective for Saudi Arabia is achieving resilience against historically low crude oil prices. This necessitates effectively harnessing its youth population, which constitutes sixty percent of the Gulf region's demographic [22] [23]. This means that Saudi Arabia must scramble to create opportunities to harness this potential through job creation and Saudization, thus increasing disposable income in the households and allowing nationals from different classes across the Middle East to purchase goods and services as well as provide an education to their future offspring and continue to stimulate the economy [24].

The literature on Saudization programs falls under the broad literature of labor economics which focuses on the impact of quota-based employment programs. Saudization includes the involvement of strict reforms and placement of restrictions on private sector companies via the implementation of quotas. Studies that look at labor market quotas come to the consensus that they do initially bring in benefits in the longer terms [25]. Similarly, several recent studies have delved into studying the influence of the Saudization program on the overall labor market of Saudi Arabia. Harvard Kennedy School collaborated with the Saudi Human Resources Development Fund (SHRDF) to produce a comprehensive paper examining the challenges within the employment sector. This ongoing initiative aimed to identify and address labor market issues through collaboration between researchers and policymakers [26]. Moreover, another study conducted an empirical analysis of the quota-based Nitaqat policies, revealing a potentially positive outcome [14]. One study explored the broader economic implications of Saudization, particularly concerning minimum wage policies, with a positive Saudi economy's integration into the global market [27]. Likewise, a study provided an overview of the Saudization program, highlighting its origins and factors driving its implementation and depicted that the program has successfully increased job opportunities for Saudis and reduced outward remittances. As the initiative evolves, opportunities exist to further align workforce skills with market demands, optimize operational costs for businesses, and enhance the investment climate to attract more international capital [28].

One of the Doctoral research projects delves into the exploration of whether the Saudization, aimed at increasing the employment of Saudis, effectively addresses the unemployment dilemma [29]. Similarly, another study highlights the ongoing debate surrounding Saudization, while policymakers recognize its importance for economic and social stability, and it concludes that Saudization policies are being tailored to the realities of the labor market to enhance their effectiveness [30]. Another study supplements this discussion by providing background information on the Saudi government's efforts to bolster local manpower and reduce reliance on foreign labor through Saudization [31]. Despite strides in education, training, and job creation, there's still a research gap in

reducing dependence on foreign labor in the private sector and developing local human resources to the required standards. Thus, based on the discussion, it can be said without a doubt that there is a need for reforming the policies to put the Saudization program on the track of a fast-paced economic and local labor market growth. However, the identification and selection of the best policies that will surely result in the ultimate success of the Saudization program is still a challenge and a gap in the literature, as none of the previous studies has made an active stride to give a sure policy that would yield positive outcomes.

Therefore, this paper aims to fill that gap and add to the literature on Saudization by providing a list of top policies ranked based on their ability to enhance the Saudization program using a hybrid FMCDM technique like the based FVIKOR method. However, to root out the best policies for revamping the Saudization program, this literature also reviews some of the top quota-based policies from studies around the world. The affirmative action program in the United States is one of the most widely studied quota-based employment programs around the world. Affirmative action program mandates quotas for minority employment in both government and private sector jobs through the use of government contracts in the country [32]. Likewise, other countries like India, have also implemented similar quota-based policies, which have shown positive effects on minority employment rates, which has also in turn led to an increase in household consumption [33].

The recent literature comprises various methodologies that can assist in the selection and ranking of concerned resilient policies that can aid in effective decision-making. Various methodologies such as TOPSIS, ANP, FUCOM, etc. These approaches come with certain limitations such as Euclidean distances to the ideal and non-ideal solutions that might depict the wrong idea of real-world preferences in the case of TOPSIS [34]. Similarly, ANP carries complexity in its overall networks of criteria and alternatives, and with the data intensity, it becomes impractical, especially in the case of large-scale problems [35]. In the case of FUCOM, it demands perfect weight consistency which is unrealistic in a practical scenario and makes it difficult to handle or accommodate moderate inconsistencies [36]. Such limitations lead us to the choice of adopting more compact assessment methods such as FAHP, whose hierarchical structure simplifies complex problems and enhances transparency with consistency checks. Similarly, VIKOR offers compromise solutions and stability, along with explicit trade-offs. Such options cater to the needs of the current research as their applications are non-existent in such a case scenario, thus forming one of the research gaps.

In the first stage, FAHP is being utilized in the current research to assess the criteria factors, as depicted in Table 1. Its applications are numerous with one of the studies applying it with SWOT analysis to opt for the top renewable energy resources [37]. Similarly, another study integrated it AHP technique in a spherical fuzzy set with the TOPSIS technique to choose the top manufacturing system for production [38]. An application of the AHP also involves the assessment of quality in a business [39]. The applications of the AHP can also be found in various engineering and technical applications, not to mention the social sciences and environment studies [40]. Lastly, the AHP can also be observed as the critical decision factor towards the enhancement of the supply chain's resilience [41]. Furthermore, FVIKOR is the second method applied in this study to evaluate the policy alternatives, as mentioned in Table 3. In one of the studies, the FVIKOR technique in a hybrid combination with the Best-Worst technique was able to evaluate the airport's green performance [42]. Whereas, in developing countries context,

it has been applied for the selection of the most viable wastewater treatment technology that can be used in Pakistan [43]. A few other applications of the F-VIKOR can be observed in the case of the satisfaction level of the citizens in municipality services [44], image recovery of a tourist destination [45], post-terrorism, and selection of a sustainable supplier in the case of cold supply chain [46].

The current research employs AHP in a hybrid combination with the VIKOR methodology, owing to the effective recent applications in the literature. In one of the cases, AHP-based VIKOR is applied for the ranking of different risks in self-driving vehicles [47]. Similarly, in another study, FAHP is used with FVIKOR in the construction of a resilience framework for critical infrastructures in the context of developing nations [48]. Furthermore, other recent applications of such a hybrid combination can be found in the case of third-party logistics selection in a sustainable supply chain [49], systematic layout planning [50], and lastly, for the assessment of water treatment plant's failure modes [51], to mention a few.

2.1. Research Gap

Based on the aforementioned discussion regarding the recent literature, no recent studies have cited the applications of the Saudization program to highlight the best policies that can further enhance the local employment and establish a sustainable economy, thus the goal of the current research. Similarly, Nevertheless, no utilization of the adopted hybrid methodology, that is being adopted for the current research, is found where it has been applied for the selection of the best policy for the Saudization program. Therefore, the research has offered novelty mainly in two areas i.e., the fulfillment of the literature gap through the evaluation of the top policies for revamping the Saudization program, and secondly, the use of hybrid FAHP-based FVIKOR method in such a case scenario, thus adding to the research gap and novelty of the current research.

3. METHODOLOGY

This research uses primary data to conduct FAHP-based FVIKOR analysis. The data collection process begins by identifying various policy evaluation criteria that can accurately assess policy success. After an extensive review of relevant literature, we have identified a total of four criteria for evaluating different policies. These criteria, along with their descriptions or justification, are summarized in Table 1.

Table 1: Criteria considered for evaluating the best policy for the Saudization program

Criteria	Description
C1. Positive Economic Impact **[52]**	Policies that have a positive impact on the economy of Saudi Arabia.
C2. Long Term Sustainability **[53]**	The ability of a policy to give consistent results over time in the long run
C3. Positive Social Impact **[54]**	Policies that have a positive societal impact on Saudi Arabia.
C4. Recovery of Investment **[55]**	The time it takes a policy to recover the initial investment.

Following the identification of criteria for policy evaluation, a questionnaire was developed to collect primary data to be used in the FAHP. In this questionnaire, experts were requested to assess the importance of each criterion relative to each other using a Likert scale, as depicted in Figure 1 in Section 4. The data was gathered from Human

Resource Management (HRM) and other experts across various sectors, who had a minimum of five years of experience working in Saudi Arabia and were familiar with the Saudization program. Specialists were identified from sectors prioritized under Saudi Arabia's Saudization (Nitaqat) program, including banking, retail, and industrial services. Recruitment focused on professionals actively implementing workforce nationalization initiatives, with final expert representation evolving to ensure balanced perspectives from human resources, policy compliance, and private sector management domains. In total, fifteen experts were selected due to their familiarity with the Saudization program and HRM, out of which only ten experts responded. Detailed demographic information about these experts is presented in Table 2.

Table 2: Demographics of respondents

Experience	Gender	Designation
5-10 (5, 50%)	Male (9, 90%)	Human Resource Managers (3, 30%)
11-15 (3, 30%)	Female (1, 10%)	Academia (4, 40%)
16-20 (2, 20%)	Prefer Not to Say (0, 0%)	Ministry of Labor (1, 10%)
		Employee (2, 10%)

Upon acquiring the primary data from the ten experts for the FAHP method. The number of experts was deemed enough because according to [56], the samples beyond 10 carry redundancy patterns for the factors that are to be assessed via FAHP hierarchies. The next step was formulating the policies for revamping the Saudization program. Drawing from extensive literature studies, these revamping policies are carefully identified, considering both quota-based and need-based requirements of both the Saudi government and the private sector companies operating in the country. A mini-Delphi approach was employed, involving experts to eliminate redundancy and choose the most effective policies for revamping the Saudization program from the perspective of Saudi Arabia. This process consists of a single-round interview and selection-based procedure, during which experts carefully choose the optimal policy types. Based on policies nature, the selection was narrowed down to three options by the experts. The final policies are summarized in Table 3.

Table 3: Brief description of the policies

Policies	Description
P1. Skill-Based Scholarship Program **[57]**	Smart and talented Saudis are to be sent abroad to first-world countries on government scholarships to refine their skills up to the required standards.
P2. Youth Mobilization Program **[58]**	Encouraging youth to make their living by helping them in their startups or finding jobs according to their skill sets, and taxing lazy youth
P3. Very High Risk-Reward Balance **[14]**	Rewarding compliant companies with high tax reliefs and lower tax brackets while punishing non-compliant companies with the highest tax rates and fines

Following the identification of policies for the Saudization program, a questionnaire was developed for the FVIKOR method. The questionnaires were sent to the ten experts to collect primary data. The experts were asked to evaluate individual policies against various criteria, which were subsequently analyzed using the FVIKOR method. This technique

helped identify the most effective policy for revamping the overall Saudization program from the perspective of Saudi Arabia.

3.1. Fuzzy-AHP-Fuzzy-VIKOR

The integrated approach first applied Fuzzy AHP to determine criterion weights. Experts evaluated pairwise comparisons using triangular fuzzy numbers (1/9 to 9 scale) to address linguistic uncertainty. Consistency ratios below 0.1 confirmed judgment reliability. These fuzzy weights were then defuzzified using the centroid method. Subsequently, F-VIKOR processed the normalized decision matrix to calculate utility (S) and regret (R) measures for each Saudization policy alternative. The compromise solution was derived by minimizing R while maximizing collective benefit, with ranking stability verified.

In this research, in the first stage, we employ FAHP in conjunction with the FVIKOR method to identify the most effective policy for revamping the Saudization program and steering it toward success. The analytical process involves the following steps:

1st Step: Initially, FAHP is utilized to determine the relative importance weights of the four policy evaluation criteria. As per the collection process outlined in Section 3 above, data for the FAHP was gathered from the ten experts. The experts were requested to allocate weights to the different criteria based on their perspective of the Saudization program. A five-point fuzzy Likert is used which is depicted in Figure 1, and it is employed to handle the inherent uncertainty in human judgment. The experts expressed their opinions regarding the four criteria through the linguistic set U = {VL, L, M, H, VH}.

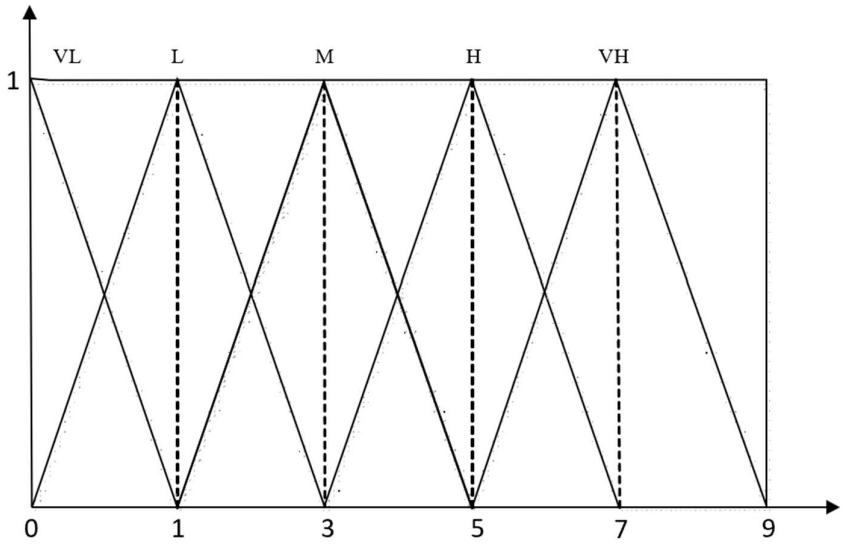

Figure 1: Linguistic scale

Each of the linguistic variables is transformed into a triangular fuzzy number using Table 4.

Table 4: Fuzzy triangular numbers

Linguistic Variable	Fuzzy Triangular Numbers
Very Low (VL)	(0,0,1)
Low (L)	(0,1,3)
Moderate (M)	(1,3,5)
High (H)	(3,5,7)
Very High (VH)	(5,7,9)

2nd Step: A pairwise comparison matrix is created using Eq 1, for the criteria set $CEP = \{CEP_z | z = 1,2, \dots 16\}$. It is based on the data obtained from the experts.

$$A = \begin{bmatrix} 1 & \dots & a_{1j} \\ \vdots & 1 & \vdots \\ a_{j1} & \dots & 1 \end{bmatrix} \quad (1)$$

3rd Step: Using Eq 2, the calculations of the Fuzzy geometric mean are carried out.

$$r_i = \left[\left(k_1 \otimes k_2 \otimes \dots, k_j\right)^{1/j}, \left(l_1 \otimes l_2 \otimes \dots, l_j\right)^{1/j}, \left(m_1 \otimes m_2 \otimes \dots, m_j\right)^{1/j} \right] \quad (2)$$

4th Step: Through the use of Eq 3, the Fuzzy weights of each criterion are calculated. The weights are later used in FVIKOR analysis.

$$w_i = r_i \otimes \left(r_1 \oplus r_2 \oplus \dots r_j\right)^{-1} \quad (3)$$

5th Step: The policy evaluation criteria are calculated using Eq 4. It gives the crisp values of each criterion that are then normalized and ranked.

$$w_i = \frac{k+l+m}{3} \quad (4)$$

6th Step: Following the determination of criteria weights using FAHP, the FVIKOR method is employed to rank the policies for the Saudization program. The data for FVIKOR is gathered through the process outlined in Section 3. The experts are requested to assign linguistic variables to different policies based on their perspective of the Saudization program, utilizing a five-point fuzzy Likert scale depicted in Figure 1. With the help of Table 4, the linguistic variables are transformed into their subsequent Fuzzy numbers.

7th Step: Using Eq 5, a Fuzzy Decision Matrix (FDM) is created using the data gathered from the experts.

$$FDM = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1v} \\ \vdots & \vdots & \ddots & \vdots \\ x_{u1} & x_{u2} & \dots & x_{uv} \end{bmatrix} \quad (5)$$

where, $i = 1,2,3 \dots u$, $j = 1,2,3 \dots v$ and x_{ij} represent the rating assigned to Policies P_i concerning Policy Evaluation Criteria C_j by the ten experts.

8th Step: Then using Eq 6, Fuzzy best values and through Eq 7, Fuzzy worst values are calculated for all of the criteria PEC_j.

$$f_j^* = max_i x_{ij} \quad (6)$$

$$f_j^- = min_i x_{ij} \quad (7)$$

where, $\left(f_j^* = f_{jk}^*, f_{jl}^*, f_{jm}^*\right), \left(f_j^- = f_{jk}^-, f_{jl}^-, f_{jm}^-\right)$. Here f_j^* and f_j^- represent the Fuzzy best and Fuzzy worst values, respectively.

9th Step: Through Eq 8 and Eq 9, the values of S_i and R_i are measured, respectively.

$$S_i = \sum_{j=1}^{v} \frac{w_j\left(f_j^* - x_{ij}\right)}{\left(f_j^* - f_j^-\right)} \tag{8}$$

$$R_i = max_j \left[\frac{w_j\left(f_j^* - x_{ij}\right)}{\left(f_j^* - f_j^-\right)}\right] \tag{9}$$

where, $(S_i = S_{ik},\ S_{il},\ S_{im}), (\ R_i = R_{ik},\ R_{il},\ \ \ \ )$ Rim, and w_j are the Fuzzy weights of criteria that were calculated in Step 4 with the help of FAHP.

10th Step: Using Eq 10, the Q_i value is calculated for all the alternatives.

$$Q_i = \frac{v(S_i - S^*)}{(S^- - S^*)} + \frac{(1-v)(R_i - R^*)}{(R^- - R^*)} \tag{10}$$

where, $(Q_i = Q_{ik}, Q_{il}, Q_{im})$.

$$S^* = min_i\ S_{ij}, S^- = max_i\ S_{ij}$$

$$R^* = min_i\ R_{ij}, R^- = max_i\ R_{ij}$$

where S^* and S^- denote the minimum and maximum values of S_i. While R^* and R^- denote the minimum and maximum values of R_i. Moreover, v denotes the weight of maximum group utility, that is if $v > 0.5$ and if $v = 0.5$, then it denotes minimum individual regret.

11th Step: In the last step, the Fuzzy values of Q_i are de-fuzzified using the geometric mean equation given by Eq 11.

$$Q_i = (Q_k, Q_l, Q_m)^{1/3} \tag{11}$$

Afterward, the policies are ranked in ascending order, where the best policy for revamping the Saudization program occupies the top position.

4. RESULTS & DISCUSSION

The methodology discussed in Section 4 was followed closely to carry out the analysis for selecting the top policy for revamping the Saudization program.

4.1. Fuzzy-AHP

Firstly, the FAHP was applied to the policy evaluation criteria mentioned in Table 1, where the ten experts ranked the criteria based on their impotence concerning each other, using the Likert variable given in Table 4. The collected data was then processed using steps 1 through 6, which resulted in the ranking of the criteria based on their importance for evaluating the policies for the success of the Saudization program. The results of the FAHP are given below in Table 5.

From the given results it can be observed that according to the experts, the positive economic impact is the most important criterion for evaluating the ability of any policy to revamp the Saudization program and put it back on track of success. It is followed by long-term sustainability and the positive social impact criteria, which are no doubt an important criterion in measuring the effectiveness of a policy in the long term and its impact on social

structure, especially if it's a government-based policy that will affect the lives of the citizens of a country. Finally, recovery of investment occupies the last spot in the ranking.

Table 5: Policy evaluation criteria ranking through FAHP

Policy Evaluation Criteria (C_j)	FAHP Normalized Weights (w_i)	FAHP Ranking
Positive Economic Impact	0.31	1
Long Term Sustainability	0.27	2
Positive Social Impact	0.24	3
Recovery of Investment	0.18	4

This ranking is greatly in line with the realities of the world. The point of any policy is to have a positive economic impact on the country's economy. Moreover, generally, the success of any policy is also mainly determined by its ability to have a positive impact on the economy of the country. Likewise, long-term sustainability rightly occupies the second spot, as sustainability has become a main focal point in the rapidly changing world of the 21st century. Similarly, positive social impact has also rightly occupied the third position as it is also an important criterion for any policy, especially if it's a government-based policy and would ultimately affect the lives of the people living in the country, just as in the case of the Saudization program. Finally, recovery of investment is an important economic criterion for the evaluation of policies. However, unlike in the case of private corporation policies, government-based policies focus on the bigger picture which encompasses the entire economy, population, and future of the country. Hence, in this case, recovery of investment is an important aspect to consider in selecting policies, but it still comes second to the other three policies.

4.2. Fuzzy-VIKOR

After the FAHP, the actual policies of cities in Table 3 for the revamping of the Saudization program are evaluated using the FVIKOR method. For FVIKOR analysis, data is collected from the ten experts, who rank the policies based on the policy evaluation criteria given in Table 5. After this, the collected data is analyzed by following steps 6 through 11 to get the final ranking of policies. The results of the FVIKOR method are given in Table 6 below.

Table 6: Policies ranking through FVIKOR

Policy (P_i)	FVIKOR Normalized Weights (w_i)	FVIKOR Ranking
Skill-Based Scholarship Program	0.515	3
Youth Mobilization Program	0.108	1
Very High Risk-Reward Balance	0.500	2

From the above FVIKOR results, it can be seen that the youth mobilization program has occupied the top position as the most optimal policy for revamping the Saudization program and putting it back on track successfully. The VIKOR method's stability stems from its core design to balance minimizing maximum regret and maximizing group benefit. Empirical studies confirm its reliability; for instance, manufacturing sector applications

observed rank order variations below 10% when criterion weights changed by up to 20% [59]. This policy entails that the youth should be encouraged to make their living by helping them in their startups or by helping them find jobs according to their skill sets by the government of Saudi Arabia. The next best policy on the list is the very high risk-reward balance policy which occupies the second place and it requires that there should be a shift in risk-reward balance, where the companies are encouraged to follow the Saudization program by giving them huge benefits and rewards in the form of tax reliefs. It is closely followed by the skill-based scholarship program, which occupies third place and focuses on elevating the skill base of Saudi nationals by offering talented individuals' government-based scholarships to study abroad and then come back to the country to put those acquired skills to good use.

The youth mobilization program has a high positive economic impact, as more of the youth would be put to work which will stop the cash outflow from the country, which is sent as remittance by the expatriates. Moreover, mobilizing youth and investing in them would help in acquiring long-term sustainability, as they are encouraged to work or create successful startups nationally, which will reduce dependence on foreign companies and foreign direct investments and create a sustainable budget in the long run. Furthermore, this policy will have the highest social impact, as the youngsters would be encouraged to work creating a work appreciation environment, instead of handing them everything on a silver platter without consequences. Even more, this policy will result in some high returns on investments as local companies start to emerge and youth will become tax-paying citizens whether they earn or not. A high reward policy focusing primarily on the private sector for Saudization requires strong collaboration. While government incentives provide crucial support, the active participation of Saudi nationals is vital for success. This approach holds significant potential: companies can be powerfully incentivized to embrace corporate social responsibility, launching their own initiatives like scholarships and skill-building programs to attract and develop Saudi talent. Such proactive corporate engagement, combined with national participation, fosters a mutually beneficial environment for both businesses and the nation, attracting investment and ensuring long-term economic and social progress. The skill-based scholarship program delivers significant positive social impact and long-term sustainability by expanding the skills of Saudi nationals. Realizing its full potential involves securing sustained investment through scholarship funding [60]. This investment represents a significant long-term commitment, with the full value typically realized over a period of up to ten years. This timeframe allows Saudi scholars to complete their international education (typically 2-4 years) and then build rewarding careers in the Kingdom for approximately eight years, contributing their enhanced skills and knowledge. While some scholars may initially explore global opportunities after their studies, the program actively encourages their return, leveraging their international experience for national development [61].

Overall, these policies demonstrate strong alignment with Saudi Arabia's current economic direction and the Saudization program's objectives. Progress in reducing unemployment is being accompanied by strategic focus on evolving wage structures. Significant gains in white-collar employment present opportunities to further develop the workforce across all sectors. Regularization of the labor market has been implemented, alongside economic adjustments that influence expatriate residency decisions based on individual circumstances. For many foreign workers, employment in the Kingdom continues to provide valuable income opportunities, enabling important support for

families abroad through remittances. Concurrently, Saudi nationals increasingly pursue career paths matching their qualifications and aspirations. As noted by Steffen Hertog of the London School of Economics, the data indicates a positive correlation between Saudization progress and wage trends [62]. Furthermore, Saudization implementation adapts effectively across wage levels, creating distinct opportunities. While lower-wage roles present specific recruitment dynamics, the program encourages strategic workforce development. Firms actively engage in building their national talent pipelines, supported by the Nitaqat framework which rewards proactive Saudization efforts like platinum and green tier status. Alongside this, initiatives like Youth Mobilization are energizing the next generation, opening new career pathways for both men and women, boosting personal incomes, and cultivating a strong professional drive. This momentum is further amplified by skill-based scholarship programs, developed through educational reforms that foster globally applicable, diverse thinking. Private sector participation is key, with high-engagement CSR partnerships offering company-sponsored scholarships and training. This approach incentivizes businesses to actively recruit talented nationals for advanced roles and ensures scholars return with valuable skills. Together, these strategies contribute to a more diversified economy, strengthening the private sector with highly skilled Saudi professionals in leadership positions, while complementing the vital contributions of expatriate workers in essential roles.

4.3. Research Implications and Future Recommendations

The current research carries out an immensely covered assessment of the Saudization project. The research implies that a dynamic workforce alignment is necessary to establish an adaptive skill ecosystem. The rapidly evolving labor demands that are being driven by Artificial Intelligence (AI) and automation carry the key to moving forward, but their implementation is like a two-sided sword for the Saudization project, as the AI-driven automation can threaten the Nitaqat-targeted roles, especially in the case of administrative services, etc. The skill mismatch can be another issue as currently only 42% of the universities are offering AI-related courses, and along with the imported talent, salary disparities can be a big decisive hurdle towards its adoption. Furthermore, the current Saudization projects are limited to only a few regions, and with further research, a regional economic leakage can be made to ensure that the lesser developed regions are also incorporated. Similarly, finding skill substitution pathways can always help towards the adoption of skills at the local level.

The future recommendations of the research stress the need for the implementation of the Saudization intelligence units, along with the integration of the education in workforce. Private sector optimization along with properly trained strategic AI integration is required. Similarly, future studies can also adopt relevant quantitative methods to explore such a concept in other regions or countries and formulate comparative assessments.

5. CONCLUSION

Saudi Arabia, a nation endowed with abundant natural resources in the Middle East, has historically built its economy around oil. Recognizing evolving global energy trends and strategic economic planning, the Kingdom is proactively undertaking a significant transformation to diversify its economic foundations. This forward-looking vision includes the Saudization program, a key initiative creating meaningful career opportunities for Saudi nationals within their own economy. The program focuses on developing national

talent for roles traditionally filled by foreign workers, thereby strengthening local workforce participation and retaining more national wealth within the Kingdom. As Saudi Arabia continues this ambitious economic diversification journey, the Saudization program represents an ongoing commitment to aligning workforce development with national economic goals, with further progress unfolding as these comprehensive strategies mature.

Therefore, this paper aims to enhance the Saudization program by evaluating different policies that could make the program successful. For this purpose, a hybrid method was used which utilized the FAHP-based FVIKOR technique for analysis. The results of the analysis gave the youth mobilization program as the top policy for revamping the Saudization program based on the four policy evaluation criteria. The Youth Mobilization Policy directly energizes Saudization's success by cultivating professional drive among Saudi nationals while offering a sustainable, practical path forward. Among the approaches considered, it demonstrates strong potential for lasting impact with distinct advantages for long-term implementation. Moreover, this policy could also be used in conjunction with the other two policies to create a stronger policy framework thereby increasing the chances of success even further. Hence, it is recommended that the policymakers of Saudi Arabia consider these policies in their draft of the next development plan and make full efforts to implement at the very least the top policy to yield positive outcomes in the form of lower unemployed Saudi nationals, high skill-based citizens and positive economic impacts. Similarly, the integration of education in the workforce, and the adoption of AI-driven strategies domains that can speed up the project along with the development of a skilled workforce, can prove to be a big success for the Saudization project. Moreover, the expansion of such steps must be ensured to reach more geographical locations so that the impact can be observed over the entire country's economy, and not just a few specific cities or regions. Further studies on the topic of Saudization can be conducted by using different criteria for policy evaluation and by including more policies. Moreover, the effects of the policies on the individual sectors of Saudi Arabia could also be explored and risk minimization strategies could be advised using different MCDM techniques.

5.1. Research Limitations

The current research offers a comprehensive approach to better cater to the Saudization project but it carries certain limitations. One of the limitations is the time constraint because the collection of the data from the various sectors was extremely difficult, keeping in mind the tough job routines of the experts. Similarly, the tendency to withhold giving the data is another bigger issue because of the anonymity concerns. Lastly, the limited availability of secondary data to support the outcomes was another major limitation of the current research.

Funding: This research received no external funding.

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