

Prospective Study on the Opening of the Manado–Jeddah International Route

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ABSTRACT

The opening of the international flight route between Manado and Jeddah presents a strategic opportunity to enhance connectivity between eastern Indonesia and major centers of religious activities, trade, and global mobility in the Middle East. This study aims to analyze the prospects of establishing this route through a comprehensive approach that encompasses market, operational, economic, and policy aspects. Data were obtained through a combination of demand analysis for Umrah and Hajj travel from North Sulawesi and surrounding regions, evaluation of airport capacity and supporting infrastructure readiness, as well as an economic feasibility assessment based on projected operational costs and airline revenue potential. The results indicate that demand for religious travel shows a significant upward trend, providing strong market potential. Additionally, Sam Ratulangi International Airport is considered capable of supporting medium-haul flight operations with several technical adjustments. Economically, the route has the potential to generate profits for airlines if fare strategies, flight frequency, and market segmentation are properly optimized. This study concludes that the opening of the Manado–Jeddah route holds promising prospects but requires synergy among airlines, airport authorities, and regional governments in infrastructure development and market promotion.

Keywords: *International Route; Flight Feasibility; Manado–Jeddah; Economic Feasibility; Market Analysis.*

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INTRODUCTION

Manado, the mother city of North Sulawesi Province, has experienced significant growth in the tourism and economic sectors (Manakane et al., 2023; Rahman, 2022; Ruru et al., 2024). Known for its natural beauty, including the Bunaken sea park, Manado is attractive to both domestic and international travelers. In addition, this city also functions as a trade and business center in eastern Indonesia. The potential in tourism and the economy creates demand for more international direct and efficient flight routes.

Jeddah is an essential city in Saudi Arabia, serving as the main gateway to the holy cities of Mecca and Medina. Every year, millions of Muslims from around the world, including Indonesia, journey to Jeddah to perform the Hajj and Umrah pilgrimages. Apart from that, Jeddah is also a dynamic commercial hub with various business and trade opportunities. In Indonesia, aircraft used for Jeddah flights encompass several types from various airlines, such as Garuda Indonesia operating Airbus 330 aircraft, Lion Air with Airbus 330 and Boeing 737-900ER types, and Citilink using Airbus 320 aircraft. Temporarily, airlines serving Hajj pilgrims are Garuda Indonesia and Saudi Arabian Airlines, which must obtain landing permissions and flight slot times.

The development of a direct flight route from Manado to Jeddah faces various challenges, including fluctuations in passenger demand, competition with other airlines, and international flight regulations. However, the increasing number of Hajj and Umrah passengers, as well as business connections between Indonesia and Saudi Arabia, provide a strong basis to evaluate

the feasibility of this route. The Airbus 330 aircraft offer several advantages, making it popular among airlines worldwide. According to Miftahuddin et al. (2020), developing flight routes connecting cultural and industrial centers can strengthen ties between countries and stimulate local economic growth. Similarly, Malonda et al. (2024) emphasize the importance of infrastructure development, such as road improvements and systemic arrangements, considering the strategic location of airports in supporting both domestic and international connectivity.

Manado has a sufficiently large and continually developing population. Additionally, Manado is known as an economic, tourism, and education center in the region. The potential passenger volume for international routes, especially to Jeddah—a frequent destination for Umrah and Hajj—is likely higher. When compared with Gorontalo and Palu in Central Sulawesi, the population and economic activities are possibly not as large as in Manado. This difference influences the number of prospective passengers interested in direct international flights. Furthermore, Sam Ratulangi International Airport offers more complete facilities and larger capacity to handle international flights. Adequate infrastructure is essential to support the operational feasibility of long-distance flights. The city of Manado often receives significant support from central and regional governments to develop tourism and international connectivity.

According to Lukow et al. (2023), the availability and quality of infrastructure, such as Sam Ratulangi International Airport in Manado, are very supportive of this route's operational feasibility. The airport's complete facilities and broad capacity for international flights are key factors attracting airlines to open this route. Moreover, according to Sofyan (2020), an inclusive, community-based regional transportation strategy is expected to produce extensive benefits for the public.

Previous studies provide foundational insights into the dynamics of aviation route development and its socio-economic impacts. Research by Miftahuddin et al. (2020) underscores how air routes linking cultural and industrial centers can strengthen international ties and stimulate local economic growth. Similarly, Malonda et al. (2024) highlight the critical role of infrastructure, such as airport capacity and ground transportation systems, in supporting domestic and international connectivity. Lukow et al. (2023) emphasize that the availability and quality of airport infrastructure, like Sam Ratulangi International Airport in Manado, are crucial for operational feasibility. Furthermore, Sofyan (2020) advocates for inclusive, community-based transportation strategies to maximize public benefits. While these studies address general principles of connectivity and infrastructure, there remains a distinct gap in focused, empirical research assessing the specific feasibility of a direct Manado–Jeddah route, particularly from an integrated perspective combining passenger demand, cargo potential, airline economics, and policy alignment.

This study becomes important not only to fill this gap in the literature but also as a foundational consideration for air transportation policy and regional economic development. With comprehensive analysis, the results of this study are expected to contribute to strategic planning for inclusive, community-based air transportation needs in Eastern Indonesia. The novelty of this research lies in its holistic and specific analysis of the feasibility of the Manado–Jeddah route. It integrates regional economic development in Eastern Indonesia, the airline's market expansion strategy employing a passenger-cargo dual revenue model, and a multi-

stakeholder approach encompassing passengers, freight forwarders, carriers, and regulators. The integration of these three dimensions within one study framework offers an original contribution to the literature on new flight routes oriented toward regional growth.

This study aims to comprehensively analyze the feasibility of opening the Manado–Jeddah direct international flight route, including the evaluation of potential market demand (especially for Umrah and Hajj pilgrimage trips), operational and technical readiness (including Airbus A330 aircraft suitability and Sam Ratulangi International Airport capacity), financial feasibility through investment assessment methods such as NPV, BCR, IRR, and Payback Period, as well as a review of aviation regulations and safety aspects. The results of this multidimensional analysis are expected to provide tangible benefits both academically, as a contribution to the literature on new flight route development in Eastern Indonesia, and practically, as a basis for strategic considerations by stakeholders. For the community and regional economy, opening this route has the potential to increase global connectivity, promote tourism and export trade, and provide convenience and cost efficiency for prospective pilgrims. For the aviation industry, this study offers market analysis and business models to support investment decisions and network expansion. Meanwhile, for government and related authorities, the recommendations can serve as references in policy formulation and infrastructure facilitation to achieve inclusive and sustainable air connectivity.

METHOD

The type of research used was descriptive with a mixed quantitative and qualitative approach. The descriptive research aimed to detail the conditions of the Manado–Jeddah flight route, the characteristics of the Airbus 330 aircraft, and factors affecting the route's feasibility. The quantitative approach involved: 1) analyzing flight data such as travel distance, duration, fuel requirements, passenger capacity, and operational costs; 2) surveying or utilizing historical data to measure passenger and cargo demand between Manado and Jeddah; and 3) calculating potential revenue, break-even points, and financial projections. The qualitative approach included: 1) conducting in-depth interviews with aviation experts, airline managers, and regulators to assess the route's feasibility; 2) reviewing aviation licensing, international regulations, and safety standards to ensure compliance; and 3) studying similar flight routes for relevant conclusions and recommendations.

The research was conducted in Manado, North Sulawesi, focusing on the flight route between Manado (MDC) and Jeddah (JED) at Sam Ratulangi International Airport over the period from October 2024 to April 2025. Data were analyzed using integrated quantitative and qualitative methods. Financial feasibility assessment used investment appraisal methods such as Net Present Value (NPV), Benefit-Cost Ratio (BCR), Internal Rate of Return (IRR), and Payback Period (PBP). Survey data from passengers, cargo stakeholders, airlines, and regulators were processed through descriptive statistical analysis with IBM SPSS Statistics 26 to identify trends, preferences, and perceptions. This analysis included frequency distribution, percentages, and cross-tabulation to profile market demand and stakeholder readiness.

Respondent sample sizes were calculated using Slovin's formula with a 5% precision level (Riyanto & Hatmawan, 2020 in Cahyani, 2022). Secondary data were obtained from the Ministry of Religion of North Sulawesi (annual Hajj pilgrim data), the North Sulawesi Central Statistics Agency (Muslim population data), and Sam Ratulangi Manado Airport (flight plans,

operational costs, potential passenger markets, and historical flight data). All collected data were processed with IBM SPSS Statistics 26 to derive conclusions addressing the research problems.

RESULTS AND DISCUSSION

Profile Manado Embarkation (Existing)

Hajj embarkation marks the beginning of the journey where pilgrims start traveling to the Holy Land. The embarkation process in Indonesia is complex and involves various factors such as infrastructure, management services, and health. North Sulawesi Province has the Tuminting Hajj Dormitory located in the Tuminting District, Manado City, which functions as the initial transit point for Hajj pilgrims from North Sulawesi before departure to Balikpapan Hajj Embarkation. This dormitory is equipped with basic facilities that support the departure process, such as simple accommodation for overnight stays, a manasik hall for training, and health services including physical condition screening of the congregation.

In addition, limited immigration services are available, such as passport management, although the visa issuance process is still carried out in Jakarta. However, this dormitory does not yet have quarantine facilities, full immigration services, or customs and excise services (customs clearance), which are main conditions for a full Hajj embarkation. This makes the Tuminting Hajj Dormitory a status embarkation between, not a main embarkation. According to (Habibi & Mahmud, 2020), an embarkation between is a temporary stopover place for candidate Hajj pilgrims heading to the main embarkation before departing to the Holy Land. Meanwhile, according to (Kasmir, 2008), a main embarkation is classified as one with facilities that fulfill the standard, as surveyed by KPIH (Commission Hajj Supervisor).

Analysis Economic Feasibility

In economics, the feasibility of a flight route is determined by the balance between operational costs and the potential revenue generated. Based on calculations performed using the Net Present Value (NPV), Benefit-Cost Ratio (BCR), and Payback Period (PBP) methods, the Manado–Jeddah flight route is declared financially feasible. A positive NPV value and a BCR greater than one signifies that the economic benefits gained from the route exceed the total investment and operational costs incurred.

This result supports the transportation economics theory as stated by Tamin (2000), which explains that a transportation project is considered feasible if the net profit obtained is positive relative to the total project cost. In this context, the success of the Manado–Jeddah route is measured not only by the financial profit of the airline but also by its potential multiplier effects on the regional economy, such as improvements in tourism activity, trade, and local income.

1) Net Present Value (NPV)

Calculation of NPV (Net Present Value) is used to evaluate the financial eligibility of an investment by considering discounted future cash flows up to the present moment. This can be seen in Table 1.

Table 1. Net Present Value

Rate	NPV
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10%	Rp. 365,629,810,107.79
12%	Rp. 316,872,309,465.37
14%	Rp. 274,619,413,962.10
16%	Rp. 237,843,438,100.82

Source: Processed by the author (2024)

From the results, the higher the discount rate, the lower the NPV value. This is in accordance with the financial principle that the future value of money decreases as interest rates increase. In addition, all NPV values remain positive at every interest rate level (10%–16%), so the Manado–Jeddah flight project is considered financially viable. This project has the potential to generate profit because the projected future benefits are greater than the initial investment.

According to Lestari et al. (2024), NPV analysis provides a clear picture of potential future cash flows, allowing for better decision-making in various market conditions. Furthermore, the use of NPV is an effective method for estimating the net value of expected cash flows from a project by comparing cash inflows and outflows over the project period.

2) BCR

Analysis results of the Net Benefit/Cost Ratio (Net B/C) project flights at various discount interest rates (rates) are presented. The Net B/C value describes the comparison between the present value of benefits and the present value of costs project flights. This ratio is used to evaluate investment eligibility from the perspective of economic efficiency. The Net B/C calculation results can be seen in Table 2.

Table 2. Net B/C

Rate	Net B/C
10%	3.625707793
12%	3.275564161
14%	2.972132237
16%	2.708031871

Source: Processed by the author (2024)

If the value is greater than 1, it indicates that the benefits obtained from the project are greater than the costs incurred, whereas if the value is less than 1, it means the project is detrimental. From the results of the above calculations, all Net B/C values are greater than 1, which means the project is financially worthy to be executed. The decline in Net B/C value along with increasing discount levels shows that the higher the interest rates, the smaller the net benefit compared to costs. Therefore, it indicates that the Manado–Jeddah flights remain profitable and economically efficient at all tested interest rate levels (10%–16%) because the Net B/C value obtained is well above 1.

A ratio above 1 indicates that the project’s benefits exceed the costs, which shows that the project is sustainable even in the face of market risks and uncertainties, including increasing fuel material prices, which become a significant factor in airline operational costs (Budi, 2021).

3) Gross Benefit/Cost Ratio

Gross B/C value describes the comparison between total benefits and total costs without considering the net margin. This analysis is used to determine how well the project can generate overall benefits compared to the costs incurred. The results of the Gross B/C calculations can be seen in Table 3.

Table 3. Gross B/C

Rate	Gross B/C
10%	1.178220905
12%	1.167630677
14%	1.156997676
16%	1.14634964

Source: Processed by the author (2024)

From the calculation results, all Gross B/C values were greater than 1, indicating that the project was worthy of execution because the benefits generated exceeded the costs incurred. The decrease in Gross B/C value with increasing discount levels showed that higher interest rates reduced the relative benefits compared to costs, although the project still yielded a profit.

The Manado–Jeddah flights remained economically profitable and efficient, producing total benefits at all tested interest rate levels (10%–16%). A Gross B/C value above 1 means that every Rp. 1 of cost incurred generates benefits greater than Rp. 1, making the project feasible and potentially realizable. According to Yankovyi et al. (2022), financial evaluation tools such as IRR and NPV provide important insights for managerial decisions, highlighting the need for thorough analysis to determine a project's resilience to variations in discount rates and fees.

4) Internal Rate of Return (IRR)

The IRR value is the internal rate of return or interest rate that makes the net present value (NPV) equal to zero. IRR indicates the annual profit rate that can be obtained from an investment during the project's duration. The results of the IRR calculations can be seen in Table 4.

Table 4. IRR

IRR
26.999%

Source: Processed by the author (2024)

has an investment return rate of approximately 27% per year. This figure shows the high efficiency in using capital to generate profit. If the IRR is higher than the interest rate or discount rate used (10–16% as in the previous NPV and B/C analysis), the project can

be considered financially worthwhile because the return on investment exceeds the capital costs that must be covered.

Since the IRR value (26.999%) is much higher than the highest discount rate used in the previous analysis (16%), this project is very financially viable, has profitable returns, and indicates that investment in the *Manado–Jeddah* flight route can generate significant profits compared to capital costs. Therefore, the IRR results reinforce the findings from the earlier NPV and B/C analyses, confirming that the *Manado–Jeddah* flight project is highly prospective and profitable. According to (Pratama et al., 2023), IRR analysis, together with NPV and B/C, is often used to evaluate the financial feasibility of an investment by considering future cash flows and expected returns.

5) *Payback Period (PBP)*

The Payback Period (PBP) calculation shows the duration required to recover the total initial investment cost through the net cash inflow obtained from the project. The PBP calculation results can be seen in Table 5.

PBP (years)
3 Years 6 Months 5 Days

Source: Processed by the author (2024)

Based on the above calculations, the *Manado–Jeddah* flight project has a payback period of 3 years, 6 months, and 5 days. This means that the invested capital to open the *Manado–Jeddah* route can be recovered in less than 4 years. After this period, the project's cash flow will generate net profit for investors or airline operators. The shorter the payback period, the better and more worthwhile the project, due to the faster return of capital and lower investment risk. In the context of flight projects, a return period of around 3.5 years is considered very efficient, especially for large-scale international route operations.

This result aligns with the findings from the positive NPV analysis, a Benefit-Cost Ratio (B/C) greater than 1, and an Internal Rate of Return (IRR) of 26.999%, all indicating that this project is not only profitable but also capable of returning the investment relatively quickly. Therefore, the *Manado–Jeddah* flight project is feasible to execute due to its short payback period (3 years, 6 months, 5 days), which indicates high financial efficiency and promising profit prospects.

A Benefit-Cost Ratio above 1 demonstrates that the investment will yield benefits exceeding the costs incurred, consistent with the basic principles of investment feasibility. In other words, every rupiah invested is expected to produce more than one rupiah in benefit (Malik et al., 2020).

Analysis Request Passenger

The passenger questionnaire was conducted on candidates planning to use the direct *Manado–Jeddah* flight route. Interviews were carried out with respondents from the Muslim communities in Manado, Gorontalo, Palu, Ternate, and Ambon, especially those who have

performed or plan to perform the Hajj and Umrah pilgrimages, or who undertake international travel. The profile results from the passenger questionnaire distribution are shown in Figure 1.

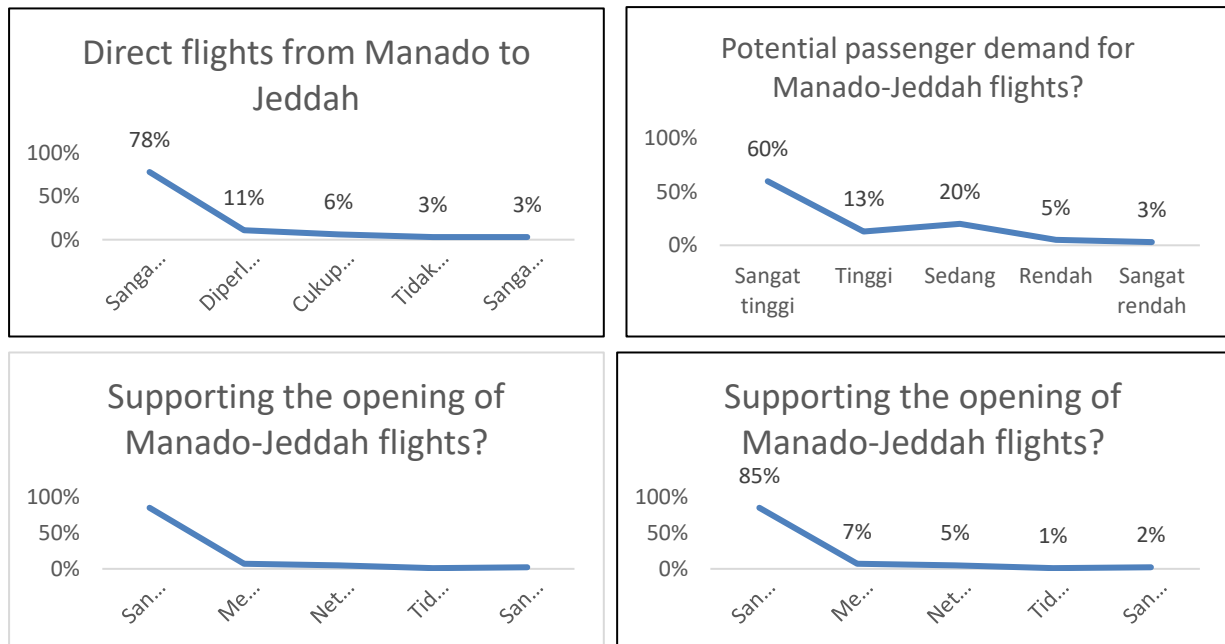


Figure 1. Graph Perception Respondents to Needs , Potential , and Support Flight Direct Manado–Jeddah

Source: Passenger questionnaire data, processed by the author (2024)

Questionnaire results showed that most respondents were very supportive of opening a direct flight from Manado to Jeddah. As many as 78% of respondents stated that the route was very necessary, followed by 11% who said it was necessary, and only 6% who were neutral or considered it less necessary. This strong support was further confirmed by findings that 85% of respondents gave a "very large" rating to their level of support for opening the route.

Regarding potential passenger demand, 60% of respondents evaluated the potential as very high, while 20% considered it sufficient, and a small portion held neutral to pessimistic views. This data indicates that the community and industry stakeholders have strong optimism about the success of the direct Manado–Jeddah flight, supported by actual needs, market demand, and community backing. These findings can serve as a strong foundation for airlines and aviation authorities to seriously and strategically plan the route's opening. According to (Dewi & Luki Adiaty Pratomo, 2023), attention to factors influencing visit intentions can further strengthen potential demand.

Analysis Cargo Potential

The eligibility analysis of the Manado–Jeddah flights also considered the potential for air cargo as a supporting component for the route's operational sustainability. Interviews were conducted with export-import business actors, logistics management, airlines, and airport authorities to understand the opportunities and challenges of transporting goods through this route. The business actors' perceptions of the Manado–Jeddah direct cargo delivery route are shown in Figure 2.

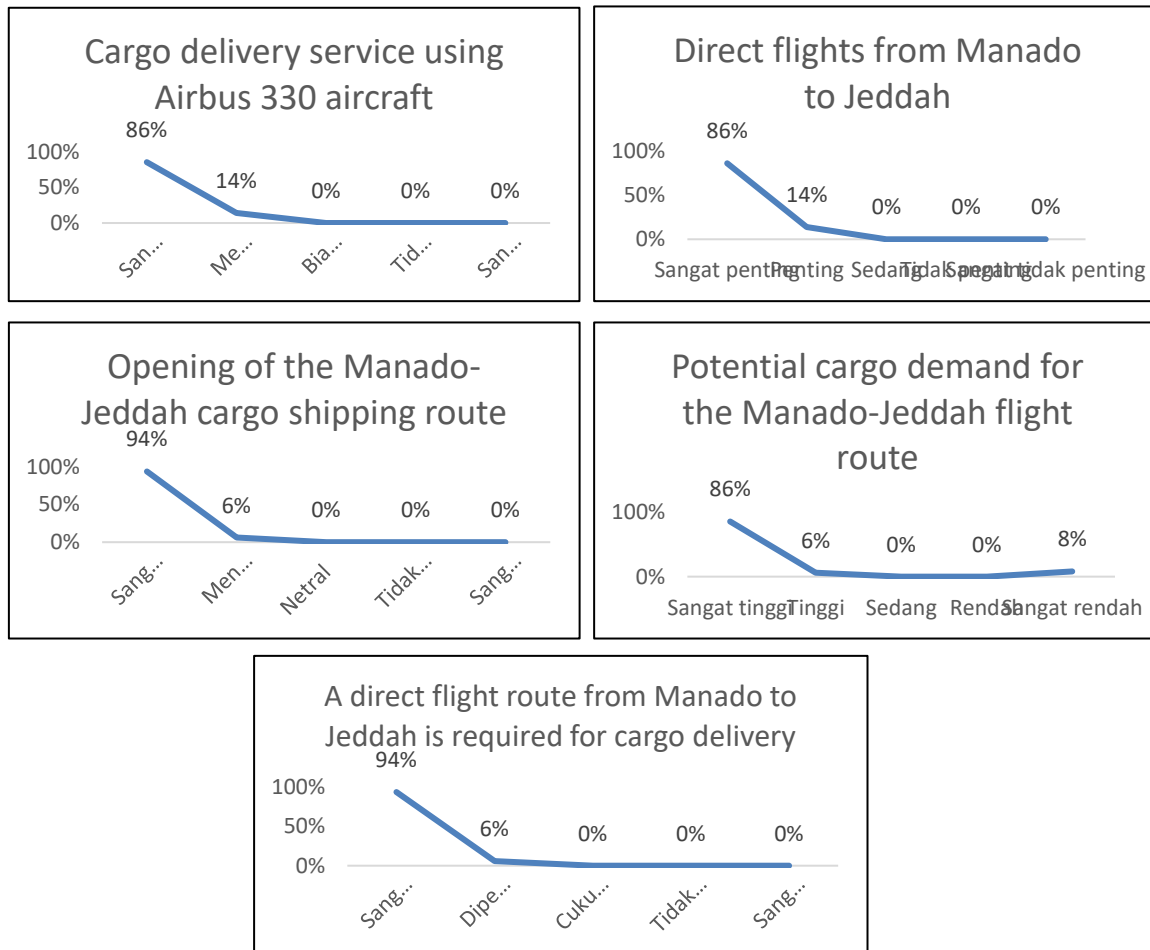


Figure 2. Graph Perception Business Actors Regarding the Manado–Jeddah Direct Cargo Delivery Route

Source: Business actor interview data, processed by the author (2024)

Based on the questionnaire results, most respondents gave a very positive rating to the existence of a direct cargo delivery route from Manado to Jeddah. Eighty-six percent of respondents evaluated that a direct flight was very important for their companies, and 94% stated that the direct Manado–Jeddah route was necessary for cargo delivery. This shows a real need from business actors for efficient and effective export-import logistics, particularly to the Middle East region.

As many as 86% of respondents also reported good experience with cargo delivery services using the Airbus 330 aircraft, which can be considered as the primary aircraft option for this route. Regarding potential cargo demand, 86% stated that it was high, although 8% were still uncertain. Additionally, the level of support for opening the Manado–Jeddah cargo route was very high, with 94% of respondents fully supporting this step.

These data show that business actors strongly support and need the direct Manado–Jeddah cargo delivery route as an efficient, reliable, and competitive logistics solution.

Analysis Flight Service Provider

From the perspective of flight service providers, interviews were conducted with representatives of airlines operating at Sam Ratulangi Airport Manado and airlines with potential to open international routes to the Middle East. The airlines' perception of the potential and operational readiness of the Manado–Jeddah route is shown in Figure 3.

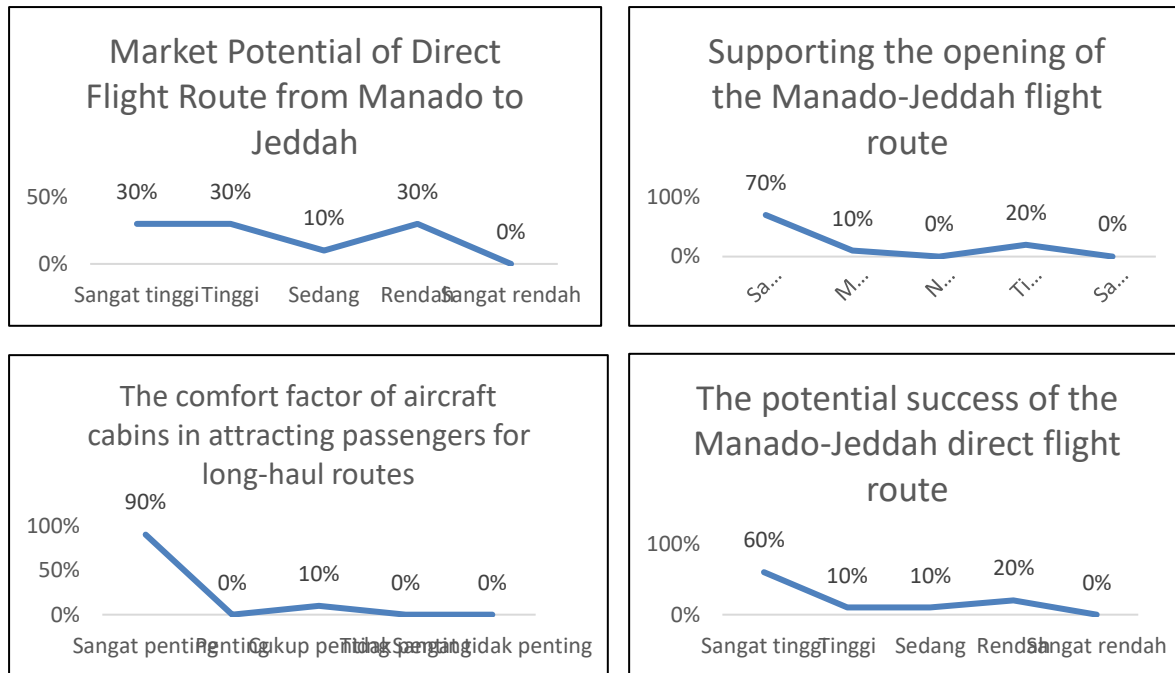


Figure 3. Graph Perception Airlines To Potential and Readiness Operational Manado–Jeddah Flight Route

Source: Airline interview data, processed by the author (2024)

Based on the questionnaire results from airlines operating on the international route or planning to expand it, the majority of respondents showed readiness and experience in operating long-distance flights and have prior experience flying to Jeddah, indicating a strong operational track record.

Next, respondents stated they operate flights to Jeddah frequently, which is an important indicator of readiness to manage a direct route from Manado. However, perceptions of the market potential for this route were still divided: 30% rated it very good, 30% good, and 30% sufficient, suggesting that further advanced analysis is needed to confirm market feasibility.

From the support side, 70% of airlines were very supportive of opening the Manado–Jeddah route, while the rest remained cautious. Notably, all respondents (100%) confirmed their airlines had Airbus A330 fleets ready for operation, strengthening the technical possibility of opening this route.

Regarding marketing strategy and passenger comfort, 90% stated that cabin comfort is very important to attract passengers on long-distance routes such as Manado–Jeddah. Furthermore, 60% of respondents rated the potential success of this route with the Airbus A330 as fairly high, although 30% thought it was currently low, reflecting a need for market adjustment strategies and more mature economic analysis. This data shows airlines' technical and

operational readiness, as well as significant support for opening the Manado–Jeddah route, but highlights the need for market risk mitigation and appropriate commercial strategies.

According to Papantoni et al. (2022), cargo routes that not only fulfill market demand but also contribute to profitability become a critical runway for airlines to maximize their potential.

Analysis Regulation and Security

Aspect regulation and security became a crucial part of evaluating the eligibility for opening an international flight route. Therefore, interviews were conducted with relevant authorities, such as the Ministry of Transportation, airport officials, immigration, customs and excise, and other aviation security personnel. The aim was to understand the readiness of regulatory, procedural, and supervisory security systems for the direct flight route from Manado to Jeddah. The regulators' perceptions of regulations and security regarding the opening of the international flight route are presented in Figure 4.



Figure 4. Graph Regulators' Perceptions of Regulation and Security for Opening International Flight Routes

Source: Regulator interview data, processed by the author (2024)

Based on the data in the table, the majority of respondents from regulatory agencies stated that international flight regulations are classified as strict, with 61% giving a score of 5 and 11% giving a score of 4. This reflects a high awareness of the importance of implementing strong regulatory standards in international flight operations. As many as 78% of respondents stated that special regulations must be complied with by airlines when opening new routes, and 89% consider security to be a very important factor in evaluating the feasibility of opening a route. This confirms that regulation and security are the main priorities for related agencies.

In addition, 67% of respondents confirmed that if a security incident were to occur affecting a new route opening, although no further details on its form were provided. Regarding the suitability of the Manado–Jeddah route with existing regulations, 44% strongly agreed and 33% agreed, indicating a sufficiently high level of confidence that the route can fulfill regulatory requirements. However, assessments of potential security risks were divided, with 33% rating it very risky, 39% fairly risky, and the remainder neutral to low. As many as 56% of respondents strongly supported the opening of the Manado–Jeddah route from a regulatory and security perspective, with an additional 22% offering moderate support. These data show that, overall, stakeholders in regulation and flight security responded positively to the route opening, although risk aspects remain an important concern.

CONCLUSION

The study concluded that the direct flight route between Manado and Jeddah is feasible and profitable, with a positive NPV of IDR 34.3 billion, IRR of 15.09%, Gross B/C Ratio of 1.0488, and a payback period of five years, indicating economic efficiency. Technically, the Airbus A330 is suitable for this route, and Sam Ratulangi Airport meets international operational standards. Passenger interest exceeds 70%, mainly driven by Umrah and Hajj pilgrims, supported by potential cargo export income. For successful launch and sustainability, strategic collaboration among stakeholders is crucial. Airlines should adopt phased market entry integrating passenger and cargo services with targeted marketing to religious travel agencies. Airport authorities and local governments should improve infrastructure and coordinate with the central government on flight slots and traffic rights. Policymakers can reinforce the route through fiscal incentives and promotional campaigns emphasizing its benefits. Future research should focus on post-launch monitoring of route performance, market dynamics, and risk management to ensure long-term sustainability and regional economic impact.

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