



## Feasibility Study of Ash Shaff Islamic Elementary School Development in Mandalajati District, Bandung City

*Encep Nurulhuda<sup>1</sup>, Juang Akbardin<sup>2</sup>, Johar Maknun<sup>3</sup>*

<sup>1,2,3,4</sup> Master of Architecture - FPTK Universitas Pendidikan Indonesia, Bandung, Indonesia

<sup>2,3</sup> Universitas Pendidikan Indonesia, Bandung, Indonesia

\*Correspondence: E-mail: [encep.nurulhuda99@gmail.com](mailto:encep.nurulhuda99@gmail.com)

### ABSTRACT

The problem of the availability of school infrastructure, especially classrooms, to the number of students who are or will enroll is a classic problem that occurs in almost all schools in Indonesia, both in schools with state and private status. Mandalajati Subdistrict is one of the subdistricts in the city of Bandung which has schools with a limited number of classrooms, including the Ash Shaff Islamic Elementary School. Therefore, the feasibility study for the development of the Ash Shaff Islamic Elementary School is very important to do. The research was conducted using quantitative methods with principals, teachers, and elementary school administration staff as the research objects. From the results of the analysis conducted, the social demand in Mandalajati District is quite large. Referring to the projected population of 6-12-year-olds who are elementary school age, the ratio of the number of classrooms needed to the available classrooms is 50%. The 154 classrooms needed in 2022 have not been fulfilled and will continue to increase in the following years. The results of the financial analysis show that this development is feasible with a breakeven point in year 6, the NPV is positive, namely  $15815992.17 > 0$ , the results of the interpolation found that  $i_1$  or the interest rate that produces the smallest positive NPV is 2.55% with  $NPV_1 = 8,250,616.43$  and  $i_2$  or the interest rate that produces the smallest negative NPV of 2.56% with  $NPV_2 = -811,339.58$ ,  $BCR 3.6\% > 1$  feasible investment, Pay Back Period (PBP) 6.5 years.

Copyright © 2023 Universitas Pendidikan Indonesia

### ARTICLE INFO

#### **Article History:**

*Submitted/Received 1 March 2023*

*First Revised 20 May 2023*

*Accepted 25 September 2023*

*First Available online 1 October 2023*

*Publication Date 1 November 2023*

#### **Keyword:**

Infrastructure,  
classrooms,  
social demand,  
worthy

## 1. INTRODUCTION

In living his life, education is needed by humans as a medium to develop their inner potential which is assisted by students through the learning process or in other ways that are acceptable to society and can make people who believe and fear God Almighty (BAPPENAS RI, 2003). To realize people who believe and fear God Almighty, Integrated Islamic School-based education is an education system that combines the national education curriculum with Islamic education in equal proportions (JSIT, 2016). Islamic-based schools in the city of Bandung with a PDRB rate of 2022 increasing by 3.76% (BPS, 2022), growing quite rapidly, including one in Mandalajati District, Jatihandap Village and its surroundings which is dominated by housing with residents who have a middle economic level and the largest number of people who embrace Islam, namely 69667 people and the largest number are in Jatihandap Village, namely 25349 people (BPS, 2021).

Ash Shaff Islamic School is one of the Islamic-based schools located in the Jatihandap Sub-District, based on data from the Mandalajati sub-district, in 2021 the number of public elementary schools is 5 (five) and 1 (one) private elementary school with a capacity that has not been able to meet the growing number children aged 6-12 who need school. Every year, the acceptance of new students by the Ash Shaff Islamic School has not been able to accept new students in full. The consideration is that the number of available classrooms is not sufficient for the number of new students registering.

On the basis of the above considerations, the Ash Shaff Islamic School will develop supporting infrastructure by adding 3 new classrooms at the top of the existing building, and 9 classes in new buildings and procurement of land area of 263.58 m<sup>2</sup> which is right next to the existing land. The development is carried out to accommodate and get a good name as an educational service that will get a place in the hearts of Muslim parents with a middle economic level (Ratnasari & Suradika, 2020). The research was carried out with the aim of knowing whether or not the development plan to be carried out by the Ash Shaff Islamic School was feasible from the side of social demand and financial economy.

## 2. Literature Review

### 2.1. Social Demand

Social demand is carried out or social demand is one of the analytical processes carried out in educational planning on the basis of social demands for education (Meiyanti, 2022).

The steps taken to find out social demand are by (1) obtaining population data for age groups, (2) dividing the five year old population into one year old using the Sprague Multiplier method, (3) analyzing the population growth rate, (4) projecting a population of 6 – 12 years, (5) analyze classroom needs, (6) analyze conditions and availability of schools, classrooms, and students, and finally the results of the analysis are social demands.

### 2.2. Sprague Multiplier Method

Determining the annual number of residents from five years can be done using the Sprague Multiplier method by making a multiplication equation in which there is a multiplier coefficient that has been determined in the table below:

**Table 1.** Sprague Multiplier Table

Table and Age	F2	F-1	F 0	F+1	F+2	F+3
<b>Table 1</b>						
0			+0,3616	-0,2768	+0,1488	-0,0336
1			+0,2640	-0,0960	+0,0400	-0,0080
2			+0,1840	+0,0400	-0,0320	+0,0080
3			+0,1206	+0,1360	-0,0720	+0,0160
4			+0,0704	+0,1968	-0,0848	+0,0176
<b>Table 2</b>						
5		+0,0336	+0,2272	-0,0752	+0,0144	
6		+0,0080	+0,2380	-0,0480	+0,0080	
7		-0,0080	+0,2160	-0,0080	+0,0000	
8		-0,0160	+0,1840	+0,0400	-0,0080	
9		-0,0176	+0,1408	+0,0912	-0,0144	
<b>Table 3</b>						
10, 15, 20, 25 etc	-0,0128	+0,0848	+0,1504	-0,0240	+0,0016	
11, 16, 21, 26 etc	-0,0016	+0,0144	+0,2224	-0,0416	+0,0064	
12, 17, 22, 27 etc	+0,0064	-0,0336	+0,2544	-0,0336	+0,0064	
13, 18, 23, 28 etc	+0,0064	-0,0416	+0,2224	+0,0144	-0,0016	
14, 19, 24, 29 etc	+0,0016	-0,0240	+0,1504	+0,0848	-0,0128	

**Source: (Apriliani, 2017)**

F can be interpreted as a fraction, which means the number of five-year population groups. The total population with five-year groups measured two years prior to the fraction of the population whose unit age is being calculated is called F-2. The total population with five-year groups measured one year prior to the fraction of the population whose unit age is being calculated is called F-1. The unit of population being counted is F0. The total population with five-year groups measured one year after the fraction of the population whose unit age is being calculated is called F+1. The total population with five-year groups measured two years after the fraction of the population whose unit age is being calculated is called F+2.

### 2.3. Population Growth Rate

The formula for calculating the population growth rate is:

$$r = \left( \frac{P_t}{P_o} \right)^{1/t} - 1$$

r = Population Growth Rate

t = Time period

P<sub>t</sub> = Total Population Year t

P<sub>o</sub> = Total Population in the base year

(B. P. Statistik, 2022)

### 2.4. Population Projection

$$P_n = P_o \times (1+r)^n$$

P<sub>n</sub> = Total population after n years ahead

P<sub>o</sub> = Population in the initial year

r = Population Growth Figures

n = Total Time of Year

(Handiyatmo et al., 2010)

### 2.5. The Need for Number of Classrooms

The need for the number of classrooms can be calculated by the estimated number of students each year divided by the standard number of students in 1 class, a maximum of 28 students (PUPR, 2020).

### 2.6. Financial Analysis

In carrying out a financial analysis, the steps that must be taken are to calculate investment costs, operational costs, revenue costs, and investment feasibility, (Kusuma & Mayasti, 2014) consisting of:

#### a. NPV (*Nett Present Value*);

Calculates the net worth at the current time. Net worth is the benefits minus the costs.

$$\text{Net present value} = \frac{\text{cash flow} * t - \text{initial investment}}{(1 + i)}$$

i = interest rate

t = number of time periods

If : The NPV is positive, then the investment is feasible, the NPV is negative, then the investment is not feasible

If : NPV > 0, then the investment is worth it

NPV < 0, then the investment is not worth it

NPV = 0, then the investment has no effect whatsoever

#### b. IRR (*Internal Rate Return*);

The method is to find the value of the interest rate when the NPV = 0. The IRR interest rate is compared to the commercial interest rate.

$$\text{IRR} = i_1 + \left( \frac{\text{NPV}_1}{\text{NPV}_1 - \text{NPV}_2} \times (i_2 - i_1) \right)$$

$i_1$  = a lower interest rate so the NPV is positive  
 $i_2$  = the higher the interest rate the negative NPV  
 $NPV_1$  = Net present value at low interest rates  
 $NPV_2$  = Total present value at high interest rates

c. BCR (*Benefit Cost Ratio*);

BCR calculates the comparative value between the benefit aspect and the cost aspect.

$$BCR = \frac{\text{present value benefit}}{\text{capital cost}} \times 100\%$$

*present value benefit* = benefit aspect

*capital cost* = cost aspect

If :  $BCR \geq 1$ , then the investment is worth it (*feasible*)

$BCR \leq 1$ , then the investment is not worth it (*unfeasible*)

d. PBP (*Pay Back Period*).

the time period required to recover the amount of invested capital.

$$Payback\ period = n + \frac{(a-b)}{(c-b)} \times 1$$

$n$  = recent years the amount of cash flow has not covered the investment

$a$  = initial investment amount

$b$  = cumulative amount of cash flows in year  $n$

$c$  = cumulative sum of cash flows in years  $n+1$

### 3. Research Methods

The methodology used in this study is the Quantitative Method where the presentation in the research process is more in the form of numbers that can be displayed in the form of tables, graphs and figures so that they are better understood (Yudi Marihot, Sapta Sari, 2022).

### 4. Result and Discussion

#### 4.1 Analysis Social Demand

To find out social demand, the steps of analysis to be carried out are as follows:

##### a. Calculation of Age Group 5 years to 1 year

Population data by age group in Mandalajati District is data used to calculate the population aged 1 year, and can be seen in the table below:

**Table 4. 1** Population of Mandalajati District by Age Group

Age Group (years)	Amount (Soul)
0-4	5547
5-9	6649

Age Group (years)	Amount (Soul)
10-14	6349
15-19	5763
20-24	5620
25-29	5863
30-34	5490
35-39	6212
40-44	5746
45-49	4911
50-54	4225
55-59	3415
60+	6421

Source: (B. P. K. B. Statistik, 2021)

To calculate the number of elementary school children (6-12 years), the fractions that must be prepared are 5-9 and 10-14 years, namely F0 = 6649, F-1 = 5547, F+2 = 6349, F+2 = 5763. From the results of determining these fractions, a preparation for the calculation is carried out which is presented in the form of a table below:

**Table 4.2** Preparation for Calculation of Population Age 5-9 Years

Age	F-1	F0	F-1	F+2	Amount
	5547	6649	5547	5763	
5	0.0336	0.2272	-0.0752	0.0144	1302.574
	186.3792	1510.653	-477.445	82.9872	
6	0.0080	0.2320	-0.0480	0.0080	1366.792
	44.376	1542.568	-266.256	46.104	
7	-0.0800	0.2160	-0.0080	0.0000	948.048
	-443.76	1436.184	-44.376	0	
8	-0.0160	0.1840	0.0400	-0.0080	1310.44
	-88.752	1223.416	221.88	-46.104	
9	-0.0176	0.1408	0.0912	-0.0144	1261.451
	-97.6272	936.1792	505.8864	-82.9872	
	Amount				6189.31

Source: (Analysis, 2022)

**Table 4.3** Preparation for Calculation of Population Aged 10-14 Years

Age	F-2	F-1	F0	F+1	F+2	Amount
	5547	6649	6349	5763	5620	
10	-0.0128	0.0848	0.1504	-0.0240	0.0016	1318.403
	-71.0016	563.8352	954.8896	-138.312	8.992	
11	-0.0016	0.0114	0.2224	-0.0416	0.0064	1275.168
	-8.8752	75.7986	1412.018	-239.741	35.968	
12	0.0064	-0.0034	0.2544	-0.0336	0.0064	1470.677
	35.5008	-22.3406	1615.186	-193.637	35.968	
13	0.0064	-0.0416	0.2224	0.0144	-0.0016	1244.915
	35.5008	-276.598	1412.018	82.9872	-8.992	
14	0.0016	-0.0240	0.1504	0.0848	-0.0128	1220.955

Age	F-2	F-1	F0	F+1	F+2	Amount
	5547	6649	6349	5763	5620	
	8.8752	-159.576	954.8896	488.7024	-71.936	
Amount						6530.12

Source: (Analysis, 2022)

From the results of the preparatory table above, the population is based on 1 year, and to get the number of children who adhere to Islam, it is obtained from the number of children for 1 year multiplied by 96.62% of the population who adhere to Islam in Mandalajati District, which can be seen in the table below:

**Table 4. 4** Number of Population 1 Year Adhering to Islam

	6 Years Old	Number of Children from Residents of the Islamic Religion
Fb	1366.792	1320.541671
	7 Years Old	
Fc	948.048	915.967382
	8 Years Old	
Fd	1310.44	1266.096544
	9 Years Old	
Fe	1261.4512	1218.765456
	10 Years Old	
Ff	1318.4032	1273.79028
	11 Years Old	
Fg	1275.1682	1232.018292
	12 Years Old	
Fh	1470.67696	1420.911309
Amount	8950.97956	8648.090934

Source: (Analysis, 2022)

### b. Calculating Population Growth Rate

The next step is to calculate the population growth rate using the formula below:

$$r = \frac{(72107)^{1/4}}{60409} - 1 = 4.43\%$$

This means that population growth is happening quite rapidly, because  $r > 0$ .

### c. Calculating Population Projections

The next step is to calculate the Projected Muslim Population for the age group of 6 - 12 years from 2022 to 2026, which can be seen in the table below:

**Table 4. 5** Projection of the Islamic Religion Population with the age group of 6 - 12 years from 2022 to 2026 in Mandalajati District

Age	Total Population				
	2022	2023	2024	2025	2026
6	1427.277	1556.395	1772.301	2107.467	2616.917
7	990.0022	1079.563	1229.321	1461.803	1815.172

Age	Total Population				
	2022	2023	2024	2025	2026
8	1368.431	1492.226	1699.23	2020.578	2509.023
9	1317.275	1436.442	1635.707	1945.041	2415.227
10	1376.747	1501.294	1709.556	2032.856	2524.27
11	1331.599	1452.061	1653.494	1966.192	2441.491
12	1535.759	1674.691	1907.007	2267.648	2815.82
Jumlah	9347.09	10192.67	11606.62	13801.58	17137.92

Source: (Analysis, 2022)

#### d. Calculating Classroom Needs Every Year

To obtain information on the need for classrooms for each class in all schools in the Mandalajati District from 2022 - 2026, the number of population growth aged 6 - 12 years divided by 28 people according to the maximum standard for the number of students for 1 classroom, which can be seen in Table below:

**Table 4. 6** Classroom Requirements every year in Mandalajati District

Number of Classroom Needs Every Year	2022	2023	2024	2025	2026
	334	364	415	493	612

Source: (Analysis, 2022)

#### e. Calculation of Classroom Needs With Existing Conditions

The last stage is to find out the fulfillment of classroom facilities in schools in the Mandalajati District against the needs every year, which can be compared with school data and the availability of classrooms in each school, which can be seen in the table below:

**Table 4. 7** Existing Elementary School in Mandalajati District 2022

Number	Elementary School Name	Status	Number of Classrooms	Number of Students	Number of Study Group	Comparison Number of Classrooms with The Number of Study Groups
1	SDN 009 CIKADUT KOTA BANDUNG	Negeri	10	659	24	-14
2	SDN 046 SINDANGLAYA KOTA BANDUNG	Negeri	8	458	17	-9
3	SDN 055 JATIHANDAP KOTA BANDUNG	Negeri	8	545	19	-11
4	SDN 068 SINDANGLAYA KOTA BANDUNG	Negeri	10	680	25	-15
5	SDN 084 CIKADUT KOTA BANDUNG	Negeri	5	426	16	-11
6	SDN 165 JATIHANDAP KOTA BANDUNG	Negeri	3	264	10	-7
7	SDN 174 PASIR IMPUN KOTA BANDUNG	Negeri	8	555	20	-12
8	SDN 175 TANJAKAN KOTA BANDUNG	Negeri	5	419	15	-10



Number	Elementary School Name	Status	Number of Classrooms	Number of Students	Number of Study Group	Comparison Number of Classrooms with The Number of Study Groups
9	SDN 231 SUKAASIH KOTA BANDUNG	Negeri	7	463	16	-9
10	SDN 243 CICABE KOTA BANDUNG	Negeri	17	813	30	-13
11	SD ABU AZIS	Swasta	6	46	5	1
12	SD AL-IRHAAM GLOBAL ISLAMIC SCHOOL	Swasta	6	152	6	0
13	SD AL-QURAN	Swasta	8	92	6	2
14	SD TUNAS UNGGUL	Swasta	24	534	22	2
	JUMLAH		125	6106	231	-106

Source: (Dapodikdasmen, 2021)

The comparison results show that the number of existing classrooms is 125 classrooms, while the need for classrooms each year is 334 classrooms and continues to grow according to the estimated population growth of 6-12 years. In addition to these needs, the number of classrooms and study groups in each school is still lacking, meaning that the number of classrooms with the number of students is still more students. In conclusion, the social demand for both public and private elementary schools in Mandalajati District until 2026 is still quite large.

#### 4.2 Function Analysis

Ash Shaff Islamic Elementary School stands on a land with an area of 615 m<sup>2</sup> which consists of 2 building masses namely (1) Office 1 Floor, (2) Classrooms 2 floors with each floor consisting of 3 classrooms having a size of 6 x 7.8 m and the capacity of students in each classroom is 25 people. The development plan that will be carried out is the addition of land acquisition and classrooms according to the explanation in the table below:

**Table 4. 8** Ash Shaff Islamic Elementary School Development Plan, Mandalajati District, Bandung City

New Classroom on the 3rd floor	3 Classrooms	Size 6 x 7.8	Capacity 75 student
New Classroom (separate building)	9 Classrooms	Size 6 x 7.8	Capacity 225 student
Procurement of Land Area	263.58 m <sup>2</sup>		

Source: (Analysis, 2022)



**Figure 4. 1 Situation Picture of the Existing Conditions of Ash Shaff Islamic Elementary School, Mandalajati District, Bandung City**

**Source: Google Earth Pro 2022**

The basic building coefficient is set at 60%, so that the ground floor area of a new classroom on 263.58 m<sup>2</sup> land cannot exceed 158,148 m<sup>2</sup>. The planned ground floor area follows the size of the existing classroom modules, namely 6 x 7.8 with the number of classrooms on the ground floor as many as 3 classrooms, so the total area of the ground floor is 6 x 7.8 x 3 = 140.4 m<sup>2</sup>. With the increase in the number of classrooms and students, the number of teachers in the school has increased to 15 teachers and 1 principal.

## 4.2 Analysis Financial

### a. Determination of Investment Costs

From the results of the analysis that has been carried out in the function analysis, at this stage a budget plan is determined which will be used as a reference in determining investment costs, which can be seen in the table below.

**Table 4. 9 Investment Plan**

Number	Investment Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	The Land Acquisition	263.5752	m <sup>2</sup>	3,500,000.00	922,513,200.00	The expansion corresponds to the image listed in the Function analysis
2	Planning and Supervision Costs	1	Package	242,674,099.20	242,674,099.20	Assumption of Planning and Supervision Costs 12% of the value of Building Construction Implementation
3	Construction of 3 Classrooms above the existing building	93.6	m <sup>2</sup>	3,350,000.00	313,560,000.00	including planning and monitoring costs. The unit price is determined based on the estimated price per m <sup>2</sup> of a

Number	Investment Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
						simple high-rise building
4	Development permit fees	1	units	4,703,400.00	4,703,400.00	permit fee is assumed to be 1.5% of the total construction value
5	Construction of 9 Classes in New Land	421.2	m <sup>2</sup>	4,056,800.00	1,708,724,160.00	including planning and monitoring costs. The unit price is determined based on the estimated price per m2 of non-simple high-rise buildings. Price increase fee from year to 1 (one) is 10%
6	The cost of building permits for 9 classrooms	1	Package	25,630,862.40	25,630,862.40	permit fee is assumed to be 1.5% of the total construction value
AMOUNT					3,217,805,721.60	

Source: (Analysis, 2022)

#### b. Determinations of Operational Costs

Operational costs are determined based on the development of the increase in the number of students each year. Employee honorariums are determined based on the results of a survey on honorarium units currently being implemented at the Ash Shaff Islamic Elementary School, Mandalajati District, Bandung City. For building maintenance costs, 0.66% is determined based on the level of damage to the building in the first year (Adriansyah, 2008).

**Table 4. 10** First Year Operational Cost

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Principal's Honor	1	Month	14,000,000.00	168,000,000.00	
2	Teacher Honor	3	Month	6,500,000.00	234,000,000.00	
3	Administrative Officer Honor	1	Month	4,500,000.00	54,000,000.00	
4	Cleaning Officer Honor	1	Month	3,800,000.00	45,600,000.00	In 1 Years
5	Electricity And Internet Costs	1	Package	649,000.00	649,000.00	
6	Consumable Needs	1	Month	3,287,100.00	3,287,100.00	
7	Building maintenance costs and other infrastructure	1	Month	5,730,912.00	5,730,912.00	Maintenance costs are assumed to be 0.66% because the level of damage to

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
						the building is very light, over time each year it increases by 10%.
AMOUNT					889,069,084.00	

Source: (Analysis, 2022)

**Table 4. 11** Second Year Operating Expenses

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Principal's Honor	1	Month	14,000,000.00	168,000,000.00	
2	Teacher Honor	6	Month	6,500,000.00	468,000,000.00	
3	Administrative Officer Honor	1	Month	4,500,000.00	54,000,000.00	
4	Cleaning Officer Honor	1	Month	3,800,000.00	45,600,000.00	
5	Electricity And Internet Costs	1	Packge	649,000.00	649,000.00	In 1 Years
6	Consumable Needs	1	Packge	3,287,100.00	3,287,100.00	
7	Purchase of Student Chairs and Desks	75	units	600,000.00	45,000,000.00	
8	Purchasing Class Cabinets	6	units	550,000.00	3,300,000.00	
9	Puchasing of Teacher Tables and Chairs	3	units	550,000.00	1,650,000.00	
10	Building maintenance costs and other infrastructure	1	Packge	6,304,003.20	6,304,003.20	Maintenance costs are assumed to be 0.73% because the level of damage to the building is very light, over time each year it increases by 10%.
AMOUNT					795,790,103.20	

Source: (Analysis, 2022)

**Table 4. 12** Third Year Operating Expenses

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Principal's Honor	1	Month	14,000,000.00	168,000,000.00	
2	Teacher Honor	9	Month	6,500,000.00	702,000,000.00	In 1 Years
3	Administrative Officer Honor	2	Month	4,500,000.00	108,000,000.00	

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
4	Cleaning Officer Honor	2	Month	3,800,000.00	91,200,000.00	
5	Electricity And Internet Costs	1	Packge	649,000.00	649,000.00	
6	Consumable Needs	1	Packge	3,287,100.00	3,287,100.00	
7	Purchase of Student Chairs and Desks	150	units	600,000.00	90,000,000.00	
8	Purchasing Class Cabinets	12	units	550,000.00	6,600,000.00	
9	Puchasing of Teacher Tables and Chair	6	units	550,000.00	3,300,000.00	
10	Building maintenance costs and other infrastructure	1	Packge	Rp 7,450,185.60	7,450,185.60	Maintenance costs are assumed to be 0.86% because the level of damage to the building is very light, over time each year it increases by 10%.
<b>AMOUNT</b>					<b>1,180,486,285.60</b>	

**Source: (Analysis, 2022)**

**Table 4. 13** Fourth Year Operating Expenses

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Principal's Honor	1	Month	14,000,000.00	168,000,000.00	
2	Teacher Honor	12	Month	6,500,000.00	936,000,000.00	
3	Administrative Officer Honor	1	Month	4,500,000.00	54,000,000.00	
4	Cleaning Officer Honor	1	Month	3,800,000.00	45,600,000.00	
5	Electricity And Internet Costs	1	Packge	649,000.00	649,000.00	
6	Consumable Needs	1	Packge	3,287,100.00	3,287,100.00	
7	Purchase of Student Chairs and Desks	225	units	600,000.00	135,000,000.00	
8	Purchasing Class Cabinets	18	units	550,000.00	9,900,000.00	
9	Puchasing of Teacher Tables and Chair	9	units	550,000.00	4,950,000.00	

In 1 Years

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
10	Building maintenance costs and other infrastructure	1	Packge	8,023,276.80	8,023,276.80	Maintenance costs are assumed to be 0.92% because the level of damage to the building is very light, over time each year it increases by 10%.
AMOUNT					1,365,409,376.80	

Source: (Analysis, 2022)

**Table 4. 14** Fifth Year Operating Expenses

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Principal's Honor	1	Month	14,000,000.00	168,000,000.00	
2	Teacher Honor	15	Month	6,500,000.00	1,170,000,000.00	
3	Administrative Officer Honor	1	Month	4,500,000.00	54,000,000.00	
4	Cleaning Officer Honor	1	Month	3,800,000.00	45,600,000.00	In 1 Years
5	Electricity And Internet Costs	1	Packge	649,000.00	649,000.00	
6	Consumable Needs	1	Packge	3,287,100.00	3,287,100.00	
7	Building maintenance costs and other infrastructure	1	Packge	8,596,368.00	8,596,368.00	Maintenance costs are assumed to be 0.99% because the level of damage to the building is very light, over time each year it increases by 10%.
AMOUNT					1,450,132,468.00	

Source: (Analysis, 2022)

**Table 4. 15** Sixth Year Operating Expenses

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Principal's Honor	1	Month	14,000,000.00	168,000,000.00	
2	Teacher Honor	18	Month	6,500,000.00	1,404,000,000.00	
3	Administrative Officer Honor	1	Month	4,500,000.00	54,000,000.00	
4	Cleaning Officer Honor	1	Month	3,800,000.00	45,600,000.00	In 1 Years
5	Electricity And Internet Costs	1	Packge	649,000.00	649,000.00	

Number	Operational Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
6	Consumable Needs	1	Packge	3,287,100.00	3,287,100.00	
7	Building maintenance costs and other infrastructure	1	Packge	9,169,459.20	9,169,459.20	Maintenance costs are assumed to be 1.06% because the level of damage to the building is very light, over time each year it increases by 10%.
AMOUNT					1,684,705,559.20	

Source: (Analysis, 2022)

### c. Determination of Cost of Revenue

The determination of the cost of income is determined based on the results of a cost survey currently implemented at the Ash Shaff Islamic Elementary School, Mandalajati District, Bandung City which can be seen in the table below:

**Table 4. 16** Cost of Revenue

First Year						
Number	Income Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Registration Fee	50	Packge	7,000,000.00	350,000,000.00	Number of Students 50 (existing)
2	Education Development Contribution	50	Packge	350,000.00	210,000,000.00	In 12 Month
AMOUNT					560,000,000.00	
Second Year						
Number	Income Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Registration Fee	125	Packge	7,000,000.00	875,000,000.00	Number of Students 125
2	Education Development Contribution	125	Packge	375,000.00	562,500,000.00	In 12 Month
AMOUNT					1,437,500,000.00	
Third Year						
Number	Income Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Registration Fee	200	Packge	7,000,000.00	1,400,000,000.00	Jumlah Siswa 200
2	Education Development Contribution	200	Packge	400,000.00	960,000,000.00	In 12 Month
AMOUNT					2,360,000,000.00	
Fourth Year						
Number	Income Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Registration Fee	275	Packge	7,000,000.00	1,925,000,000.00	Number of Students 200

2	Education Development Contribution	275	Packge	400,000.00	1,320,000,000.00	In 12 Month
AMOUNT					3,245,000,000.00	
Fifth Years						
Number	Income Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Registration Fee	350	Packge	7,000,000.00	2,450,000,000.00	Number of Students 200
2	Education Development Contribution	350	Packge	400,000.00	1,680,000,000.00	In 12 Month
AMOUNT					4,130,000,000.00	
Sixth Years						
Number	Income Details	Quantity	Unit	Unit Price (Rp)	Amount (Rp)	Information
1	Registration Fee	425	Packge	7,000,000.00	2,975,000,000.00	Number of Students 200
2	Education Development Contribution	425	Packge	400,000.00	2,040,000,000.00	In 12 Month
AMOUNT					5,015,000,000.00	

Source: (Analysis, 2022)

#### d. Financial Analysis

##### • Investment feasibility

Investment feasibility is carried out to find out the extent of the financial turnover which is the ratio between investment costs and income costs in the form of fixed costs and variable costs so that a breakeven point is obtained when the investment costs are covered. A more detailed explanation can be seen in the table below.

**Table 4. 17** Analysis of the Feasibility of Investing in the Development of Ash Shaff Islamic Elementary School Classrooms

Number	Description	Year						
		1	2	3	4	5	6	
A	Investment and Spending							
1	Construction Stage :							
	Licensing Fees	30,334,262	30,334,262					
	Development Cost	2,022,284,160	2,022,284,160					
	Planning & Supervision Costs	242,674,099	242,674,099					
2	Biaya Pengadaan Tanah	922,513,200	922,513,200					
Amount		3,217,805,722	3,217,805,722					
B	Operating Costs							
		7,365,592,877	889,069,084	795,790,103	1,180,486,286	1,365,409,377	1,450,132,468	1,684,705,559
Amount		7,365,592,877	889,069,084	795,790,103	1,180,486,286	1,365,409,377	1,450,132,468	1,684,705,559
Cumulative Total		7,365,592,877	4,106,874,806	795,790,103	1,180,486,286	1,365,409,377	1,450,132,468	1,684,705,559



C								
Income								
1	Student Registration Fee	8,400,000,000	350,000,000	875,000,000	1,400,000,000	1,925,000,000	1,925,000,000	1,925,000,000
2	Education Development Contribution	3,052,500,000	210,000,000	562,500,000	960,000,000	1,320,000,000	1,320,000,000	1,320,000,000
Amount		11,452,500,000	560,000,000	1,437,500,000	2,360,000,000	3,245,000,000	3,245,000,000	3,245,000,000
Cumulative Total			560,000,000	1,437,500,000	2,360,000,000	3,245,000,000	3,245,000,000	3,245,000,000
Difference			(6,764,680,527)	(6,122,970,630)	(4,943,456,916)	(3,063,866,293)	(1,268,998,761)	291,295,680
The Assumption of calculating the time of return on capital/investment								
Total Receipt Amount		11,452,500,000						
Total Investment Amount		10,583,398,598						
Number of Years of Payback		6						

Source: (Analysis, 2022)

#### • **Nett Present Value (NPV)**

Cash flow per year of Rp. 1,908,750,000.- per year with an interest rate of 39% and an initial investment of Rp. 3,217,805,722,-. Calculation of Net Present Value can be seen in the table below:

Table 4. 18 Calculation of Nett Present Value (NPV)

Year to :	NPV	(1+r)^	FV	PV
1	(2,814,928,023.76)	1.39	560,000,000	402,877,697.84
2	(1,970,084,169.65)	1.1521	1,437,500,000	1,247,721,551.95
3	(989,959,341.05)	1.059319	2,360,000,000	2,227,846,380.55
4	(46,179,424.72)	1.02313441	3,245,000,000	3,171,626,296.88
5	(1,821,680.01)	1.00902242	3,245,000,000	3,215,984,041.59
6	15,815,992.17	1.003518744	3,245,000,000	3,233,621,713.77

Source: (Analysis, 2022)

Net Present Value is positive in the 6th year with a result of 15815992.17 < 0, so the investment is declared feasible.

#### • **Internal Rate Return (IRR)**

The method used is the interpolation method. The results of the interpolation found that  $i_1$  or the interest rate that produces the smallest positive NPV of 2.55% with NPV1 = 8,250,616.43 and  $i_2$  or the interest rate that produces the smallest negative NPV of 2.56% with NPV2 = -811,339.58.

#### • **Benefit Cost Ratio (BCR)**

Aspects of benefits or projected total revenue of Rp. 11,452,500,000, - while the capital cost or total investment is Rp. 3,217,805,722,-. So that the benefit cost ratio obtained is 3.6%, meaning that the benefit cost ratio is greater than 1 and the investment is feasible.

- **Pay Back Period (PBP)**

With an initial investment of Rp. 3,217,805,722, -, the cumulative amount of cash flows in the nth year is Rp. 11,452,500,000, - and the cumulative amount of cash flows in the n+1 year is Rp. 3,245,000,000, -, then the period of time needed to get back the amount of money used as investment capital or Pay Back Period is 6.5 years.

## 5. CONCLUSION

The results of the analysis show that social demand in the Mandalajati sub-district, Bandung City is quite large, this can be seen from the need for classrooms from 2022 to 2026 which has increased quite rapidly in line with projected population growth, as well as the existing condition of classrooms in each school that are still unable to make ends meet. The financial analysis carried out shows that the development of the Ash Shaff Islamic Elementary School in Mandalajati District, Bandung City is feasible to develop starting from the breakeven factor in year 6, the NPV is positive, namely 15815992.17 > 0, The interpolation results found that  $i_1$  or the interest rate that produces the NPV smallest positive 2.55% with NPV1 = 8,250,616.43 and  $i_2$  or the interest rate that produces the smallest negative NPV 2.56% with NPV2 = - 811,339.58., BCR 3.6% > 1 feasible investment, Pay Back Period (PBP) ) 6.5 years. In this feasibility study, apart from being based on benefits, it is hoped that benefits cannot be measured in terms of monetary values alone, but values that cannot be measured are also present and it is hoped that the community around the school will benefit from them.

## REFERENCES

- Adriansyah, R. T. (2008). Estimation of Building Maintenance Costs Based on Building Maintenance and Maintenance Guidelines (PERMEN Number: 24/PRT/M/2008) Case Study of the Bangkinang Islamic Center Mosque Building). 1–16.
- Akbardin, J., Permana, A. Y., and Nurahman, H. (2020). The Study Degree of Saturation on Toll Road Access Based on Changes in Urban Settlement Land. *Journal of Physics: Conference Series*, 1625(1). <https://doi.org/10.1088/1742-6596/1625/1/012038>
- Akbardin, Juang, and Permana, A. Y. (2020). The Characteristics Study Of Parking User Behavior Toward Location Accessibility Of Non-Commercial Activities Center. *International Journal of Advanced Science and Technology*, 29(7), 3293–3300.
- Apriliani. (2017). The Sprague Multiplier Concept in Education.
- BAPPENAS RI. (2003). Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System.
- BPS. (2022). Statistical Reference Information System - View Indicators. In Central Statistics Agency. <https://sirusa.bps.go.id/sirusa/index.php/indikator/798>
- BPS. (2021). Mandalajati District in Figures 2021.
- BPS. (2022). Bandung City in Figures 2022. 522.
- Dapodikdasmen. (2021). Bandung City Student Data. In Ministry of Education, Culture, Research and Technology. <https://dapo.kemdikbud.go.id/pd/2/026000>
- Gunardi, Y., Handayani, S., Permana, A. Y., and Widaningsih, L. (2021). ARCHITECTURAL PHILOSOPHY OF THE AL-MISHBAH MOSQUE: Iko-Index-Symbol Arsemiotic Study. *Journal of Architectural Zoning*, 4, 283–294. <https://doi.org/10.17509/jaz.v4i2.32963>
- Hakiki, R., Aldy, P., and Hidayat, W. (2020). Duri Oil and Gas College with the

- Implementation of Passive Cooling. *ZONING Architectural Journal*, 3(3), 299–312. <https://doi.org/10.17509/jaz.v3i3.26502>
- Handiyatmo, D., Sahara, I., and Rangkuti, H. (2010). Guidelines for Calculating Population and Labor Force Projections. In BPS-Jakarta.
- Hantono, D., Butudoka, Z., Prakoso, A. A., and Yulisaksono, D. (2019). Adaptation of the Jiung Market Space Settings to the Presence of a Temporary Market on Jalan Kemayoran Gempol Barat, Jakarta. *ZONATION Architectural Journal*, 2(2), 75. <https://doi.org/10.17509/jaz.v2i2.13628>
- JSIT. (2016). Understanding Integrated Islamic Schools | *INDONESIAN Integrated Islamic School Network (JSIT)*. <https://jsit-indonesia.com/sample-page/pengertian-school-islam-terpadu/>
- Kencanasari, R. . V., Surahman, U., Permana, A. Y., and Nugraha, H. D. (2020). Indoor Air Quality Conditions in Non-Slum Settlements in Bandung City. *ZONING Architectural Journal*, 3(3), 235–245. <https://doi.org/10.17509/jaz.v3i3.28134>
- Kusuma, P. T. W. W., and Mayasti, N. K. I. (2014). Analysis of the financial feasibility of developing a local commodity production business: corn-based noodles. *Agritech*, 34(2), 194–202.
- Meiyanti, P. (2022). Analysis of Elementary School Classroom Needs Based on School Age Population Projections, Qualitative Study of the Social Demand Approach in Kiaracondong and Bandung Kulon Districts, Bandung City in 2022-2026. *Indonesian Educational Innovation*.
- Nurrahman, H., Permana, A. Y., and Akbardin, J. (2022). A virtual tourism model as an alternative to the concept of post Covid-19 educational tourism in Bandung. *International Conference on Mathematics and Science Education (ICMScE)*, 1–8. <https://doi.org/https://doi.org/10.1063/5.0122355>
- Permana, A. Y., Mardiana, R., Dewi, N. I. K., Sumanta, R. V. V., Ezzaty, F. M., and Nareswari, P. A. (2022). Evaluation of Classroom Performance in The Post-Covid- 19 New Normal Era at The Building Program Vocational High School. *Journal of Southwest Jiaotong University*, 15(2), 126–145.
- Permana, A. Y., Nurrahman, H., and Permana, A. F. S. (2021). Systematic assessment with “poe” method in office buildings cases study on the redesign results of office interior after occupied and operated. *Journal of Applied Engineering Science*, 19(2), 448–465. <https://doi.org/10.5937/jaes0-28072>
- Prabawa, M. S., Indriani, W., and Dewiyanti, H. (2019). Spatial Mitigation of Social Disasters in the Johar Baru Settlement, Central Jakarta. *ZONASI Architectural Journal*, 2(1), 46. <https://doi.org/10.17509/jaz.v2i1.15062>
- PUPR, K. (2020). Circular Letter Number 47/SE/DC/2020 Concerning Technical Instructions for Design Standardization and Damage Assessment for Schools and Madrasas.
- Rahayu, N. N. S., and Swari, L. G. N. (2020). Study of the Development of Signage Systems in Architecture and Interior of Public Spaces in Denpasar Towards Denpasar, a Creative City. *ZONING Architectural Journal*, 3(3), 218–234. <https://doi.org/10.17509/jaz.v3i3.27942>
- Rahmat, A., Prianto, E., and Sasongko, S. B. (2018). Evaluation Study of Fire Phenomenon in Residential Houses in Dense Settlements. *Journal of Architectural Zoning*, 1(2), 112–122. <https://doi.org/http://10.17509/jaz.v1i2.13560>
- Ratnasari, L., and Suradika, A. (2020). Building the Reputation of Islamic Schools Among the Muslim Middle Class. 4(1), 18–29

- Setiawan, A., Akbardin, J., and Permana, A. Y. (2022). Modeling the potential of demand for design Cikembar airport terminal capacity, Sukabumi, West Java, Indonesia. *International Conference on Mathematics and Science Education (ICMScE)*, 1–8. <https://doi.org/https://doi.org/10.1063/5.0102772>
- Utami, N. W. A., & Swari, N. L. G. N. (2021). Traditional Balinese Ornaments in Building Interiors. *Journal of Architectural Zoning*, 4, 167–180.
- Vidiyanti, C., Siswanto, R., & Ramadhan, F. (2020). The effect of openings on natural lighting and natural ventilation at the Al Ahdhar Mosque in Bekasi. *Journal of Architectural Zoning*, 3(1), 20–33.
- Wijaya, K., and Permana, A. Y. (2018). Textile Tourism Image as an Identity of Cigondewah in Bandung City. *IOP Conference Series: Earth and Environmental Science*, 213(1), 012012. <https://doi.org/10.1088/1755-1315/213/1/012012>
- Wijaya, K., and Permana, A. Y. (2020). Settlement Pattern of the Village of Dayeuh Luhur, Sumedang. *Journal of Architectural Research and Education*, 2(1), 55. <https://doi.org/10.17509/jare.v2i1.24292>
- Yudi Marihot, Sapta Sari, and A. E. (2022). *Qualitative & Quantitative Research Methods Book*. In *Madani Multidisciplinary Journal (MUDIMA): Vol. Vol. 1 (April Number)*.