COST BENEFIT ANALYSIS OF CHAUDHARY BAKERY UDHYOG

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Abstract

The research aims to explore the cost analysis and cost-benefit analysis with the help of Net Present Value and Internal Rate of Return in Chaudhary Bakery Udhyog (CBU). The research attempted to show the relationship between cost and benefit of the Chaudhary Bakery Udhyog. It followed descriptive cum analytical research design. The present research work covered a time period of five years 2017 to 2021. The presentation and analysis of benefit (net profit), benefit cost ratio (BCR), net present value (NPV) and internal rate of return (IRR).

Benefit cost ratio (BCR) has been found greater than 1. Hence it can be concluded that this BCR greater than 1 may be due to the longer experience and good managerial ability. BCR is greater than 1 is represents the ratio of total benefits over total costs. It has been found that the bakery udhyog is running in profit. In the analysis NPV is greater than zero in every year. NPV is greater than zero is indicate that the total discounted value of benefit is greater than the total discounted value of costs. It is represent the udhyog performance is well. So, it is generating satisfactory profit in study period. The udhyog has a internal rate of return is 10.19%. It represents the discount rate at the NPV of Chaudhary Bakery Udhyog is equal to zero. It means present value of benefits equal to present value of costs of the udhyog. The IRR is greater than discount rate. It can be concluded that the udhyog is running well and performance is better.

Key Words: PV, BCR, NPV, IRR

Introduction

Cost benefit analysis (CBA) is a method of efficiency evaluation in a business. It is important to carry out the cost benefit analysis in a business. It can be understood in two senses. In one, it consists simply of the work necessary to present a decision taker with the information which requires in order making a decision. Other sense it goes further and includes the task of taking the decision (Turvey, 1965). According to Clough (1971), the terms tangible and intangible are synonyms for measurable and non measurable on the assumption that the only relevant measure of value is a monitory measure.

Cost benefit analyses serve deal with it in order to avoid an important source of systematic error. This study is related to the valuation of costs and benefit. It seems to be generally agreed that the expectation of future inflation should not be allowed to bias choice in favor of business where costs occur early relative to benefits. It clearly requires a forecast of the future development of the general price level, thus adding a particularly different item to this list of things which have to be forecast in making a cost benefit analysis (Garrison and Noreen, 2019).

The cost effectiveness implications of alternatives are usually evaluated as the major part of a particular study. The evaluation is performed through the mechanics of estimating the appropriate total effectiveness measurements and total system costs of the alternatives which are proposed to meet the assumed future threat and the effectiveness and costs are then related via appropriated model techniques and selection criteria (Hilton, 2017).

Cost benefit studies are typically undertaken with in a particular government department as a preliminary to budget preparation or as conducting program to ascertain optimal expenditure pattern and budget recommendation or it may be undertaken by person outside government such as pioneering work in the water resources. A study of cost benefit involves several measure steps as statement of objectives, statement of alternatives, analysis of benefit and costs (Horngren and Datar, 2009).
Benefit cost analysis is a method of efficiency evaluation in a business. It is important to carry out the cost benefit analysis in a business (Drury, 2004). In Nepalese context, bakery industry is facing many problems. There are needs for a good CBA analysis in a bakery industry. Most of udhyogs are in loss, profit earning is necessary to serve udhyog. Achieving objectives of the business industry. Cost benefit analysis tools are necessary. It is a systematic method of efficiency evaluation using cost and benefit.

Chaudhary Bakery Udyhog

Chaudhary Bakery Udhyog Farsatikar Rupendehi is one of the manufacturing industries in Nepal. It was established in 2000. It is located at Farsatiker Rupendehi. It was established with the object of producing puff, bread, dunot etc. Raw materials for bakery are imported from India and internal market. The Udhyog has employee's nine employees in various levels and skills. It uses manual base technology. Additional sales person technology and workers are hired when needed. It manufacture bakery product from raw material like flour, sugar, oil etc, and it also use labour and machinery when the manufacture the bakery product. It is small industry of producing bakery product, which supplies sufficient quantity of quality products at reasonable price in local market. It has been enjoying well establish reputation of bakery product in local market area.

Objective

The aim of the study is to explore the cost analysis and cost-benefit analysis with the help of Net Present Value and Internal Rate of Return in Chaudhary Bakery Udhyog.

Theoretical Framework

Cost is a monetary measure of the resource sacrificed or forgone to achieve a specific objective, such as acquiring a goods or service. The term has multiple meanings and different types of costs are used in different situations. Therefore a preceding term must be added to clarify the assumptions that underlie a cost measurement. A large terminology has emerged to indicate more clearly which cost meaning is being conveyed (Drury, 2004).

Cost is used specifically , it is always modified with reference to the object casted by such descriptions as direct, prime , conversion , indirect , fixed variable , controllable , product, period, joint, estimated, standard, future, replacement, opportunity, imputed, sunk, differential, marginal and out of pocket. Each modification important in computing and measuring the cost which is to serve the management levels in achieving the basic objectives of planning and control.

Benefit is the amount of revenue earned above the expenses incurred to operate the business. The word benefit implies as comparison of the business between two dates, which are usually separated by an interval of one year. It should be noted that benefits are residual income left after the payment of the contractual reward to other factors of production (Joshi, 2057).

The economic value of hydropower production is determined by three production factors namely the cost of labor, the cost of capital and energy. The water required for electricity production can be counted as the required energy (Geissmann, 2012). Similarly, Canzler (2012) elaborated methodological techniques for the assessment and evaluation of adverse ecological effects from hydropower plants on particular ecosystems and on the environment in general. Furthermore, the study discusses methods and techniques for the monetization of costs and benefits of nature protection, repair and replacement measures that need to be undertaken due to the ecological effects of hydropower plants. One section of the report deals with direct and indirect benefits of hydropower production in monetary terms. In contrast, for the cost side the effects are only discussed qualitatively and methods for the quantification of these effects are proposed. Ojha (2019) aimed to present a conceptual frame work to select a hydro power project and its viability. Basically in developing countries like Nepal this frame work plays important role in selecting particular hydropower projects.

Methods and Procedures

Research methodology helps to find out accuracy, validity suitability. The justification the present study cannot be obtained without help of proper research methodology.

Research Design

Research design is the plan structure and strategy of investigation conceived so as to obtain answers to research question and to control variance. This study attempted to show the relationship between cost and benefit of the Chaudhary Bakery Udhyog. It followed descriptive cum analytical research design.

Nature and Sources of Data

Data for this study has been collected from basic source namely, secondary data. The secondary sources of data were used in it. The secondary data unpublished documents related to Chaudhary Becary Udhyog. The present research work covered a time period of five years 2017 to 2021.

Data Analysis Methods

In order to get the concrete results from this research, data are analyzed by using different types of tools. For the data analysis the financial net present value, benefit cost analysis and simple statistical tools such as ratio analysis has been used.

Results and Findings

It deals with the analysis of sales revenue (benefit). It can be used for interpretation, analysis of variable cost, fixed cost and total cost. The presentation and analysis of benefit (net profit), benefit cost ratio (BCR), net present value (NPV) and internal rate of return (IRR) and find the concluding remarks.

Analysis of Sales Revenue (Benefits)

Actual sales are a guideline and decision making policy of future sales plan, cost reduction, cost benefit comparison which provide the past data to make policy of an organization. It is a necessary component of any organization to analysis of sales trend, cost reduction, marketing and other decision. To analyze the previous sales data of Chaudhary Bakery Udhyog, the following table presents the past sales by periods and products in Rs. from 2017 to 2021.

Table 1: Actual (Past) Sales of Chaudhary Bakery Udhyog

Year	Biscuit (Rs.)	Puff (Rs.)	Bread (Rs.)	Donat (Rs.)	Total Amount (Rs)
2017	36,015	380880	433560	425860	1276315
2018	45270	467958	534635	581578	1629441
2019	65940	460175	639025	621525	1786665
2020	77320	554800	780450	833775	2246345
2021	127575	585660	946140	1072320	2731695

Source: Chaudhary Bakery Udhyog, 2021.

Table 1 shows past sales of the Udhyog are in increasing order in every year. It may be due to social condition of the area, quality of products, cost of product, price of the product, delivery of the products, competition etc.

Cost Analysis of Chaudhary Bakeery Udhyog

Cost analysis is cost control, cost reduction and better utilization of limited resources. The Udhyog should focus decreasing the costs and it should be for better utilization of limited resources. There are different types of cost incurred in the Udhyog cost are classified in different basis in different purpose like, fixed and variable cost, product and period cost, direct and indirect cost, factory and administrative cost, controllable and non-controllable cost, sunk cost, opportunity cost etc.

Analysis of Variable Cost

A cost of production which varies with output proportionately with output that calls the variable cost like, raw material (flour, sugar, oil etc). A variable cost change in total cost as production (output) volume change. The cost which tends to be change with the change of output level is called variable cost.

Table 2: Variable Cost of Chaudhary Bakery Udhyog

(Amount in Rs)

Details	2017	2018	2019	2020	2021
Flour	276400	468800	490600	615500	706850
Sugar	100900	115400	140720	155070	270050
Oil	212600	215390	209580	407700	479800
Packing material	39150	48740	58250	60175	71520
Fuel consumption	90200	94000	97870	113900	137500
Wages and salary	342000	414000	474000	534000	600000
Total	**1061250**	**1356330**	**1471020**	**1886345**	**2265720**

Source: Chaudhary Bakery Udhyog, 2021.

Table 2 shows the total variable costs are increased every year than last year. The variable cost of year 2018 is more than 2017. Year 2019's variable cost is more than 2018 and so on. The total variable cost are increased trend which are Rs 1061250 in year 2017, Rs 1356330 in year 2018, Rs 1471020 in year 2019, Rs 1886345 in year 2020 and Rs 2265720 in year 2021. The reasons for increase in variable costs are higher expenses in flour, sugar, oil, packing material, fuel consumption and wages and salary. It is manage the cost with maximum utilization of available resources, making and implementing of effective plan, exploration of new market areas.

Analysis of Fixed Cost

Fixed costs are those costs which do not change due to changing in the output of product. It means, fixed cost remains constant or unchanged in total amount over a wide range of production levels. In the other wards, fixed cost is that which doesn't volatile in total with the change of output level. For example, if the machinery is rented for, say Rs 20000 per month this costs remains the same whether the factory operates on a time basis or shift basis.

Table 3 : Fixed Cost of Chaudhary Bakery Udhyog

Years Details	2017	2018	2019	2020	2021
Advertisement	15000	20000	20500	23000	29000
Electricity	3450	3700	3000	4200	4800
Transportation	87500	90000	95600	106420	117500
Repair & maintenance	3000	3800	9000	10500	16500
Insurance premium	-	-	-	-	19965
Interest on loan	-	-	-	-	22500
Other Expenses	3100	-	-	10075	12450
Total	**112050**	**117500**	**128900**	**154195**	**222715**

Source: Chaudhary Bakery Udhyog, 2021.

Table 3 the items included in fixed production expenses of the Udhyog is insurance premium and repair and maintenance are fixed cost. In the table 3, it makes clear that the fixed cost of sales of CBU is more in other years than the year 2021 as taken the base year. The fixed cost is lowest in year 2017 and highest in the year 2021 and it may be attributed to the increase in expenses of Udhyog insurance premium, Advertisement, electricity, transportation, Repair and maintenance, other expenses. After the year 2017 the fixed cost of sales of CBU is increasing trend up to 2021. But it is manage the CBU with utilizing its full capacity.

Analysis of Total Cost

After adding the total fixed costs and total variable costs we get total cost. It is a expenses over the year in production and selling cost. The total cost of Chaudhary Bakery Udhyog can be presented in the following table.

Table 4: Total Cost of Chaudhary Bakery Udhyog

Years Costs	2017	2018	2019	2020	2021
Total variable cost	1061250	1356330	1471020	1886345	2265720
Total fixed cost	112050	117500	128900	154195	222715
Total cost	**1173300**	**1473830**	**1599920**	**2040540**	**2488435**

Source: Chaudhary Bakery Udhyog, 2021.

Table 4 shows that the total cost of the Udhyog, it found after adding the total variable cost and total fixed cost. It is showing that the total cost is increasing trend in every year. The reasons for increase in total cost are higher expenses in flour, sugar, oil as well as fixed cost. It can be manage by maximum utilization of available resource.

Analysis of Benefits (Net Profit) of CBU

The net benefit is obtained by subtracting total cost from total sales revenue. Thus the concept of net benefit of the private business is replaced by the concept of excess of private benefit over the total cost that is net benefit.

Table 5 : Net Benefit of Caudhary Bakery Udhyog

Years / Details	2017	2018	2019	2020	2021
Sales revenue	**1276315**	**1629441**	**1786665**	**2246345**	**2731695**
Less: Variable Cost :					
Flour	276400	468800	490600	615500	706850
Sugar	100900	115400	140720	155070	270050
Oil	212600	215390	290580	407700	479800
Packing exp.	39150	48740	58250	60175	71520
Fuel consumption	90200	94000	97870	113900	137500
Wages and salary	342000	414000	474000	534000	600000
Total variable cost	**1061250**	**1356330**	**1471020**	**1886345**	**2265720**
Contribution margin	215065	273111	315645	360000	465975
Less: Fixed and other exp.					
Advertisement	15000	20000	20500	23000	29000
Electricity	3450	3700	3800	4200	4800
Transportation	87500	90000	95600	106420	117500
Repair and maintenances	3000	3800	9000	10500	16500
Insurance premium	-	-	-	-	19965
Interest on loan	-	-	-	-	22500
Other exp.	3100	-	-	10075	12450
Total fixed cost	**112050**	**117500**	**128900**	**154195**	**222715**
Net benefit	**103015**	**155611**	**186745**	**205805**	**243260**

Source: Chaudhary Bakery Udhyog, 2021.

The aim of cost benefit analysis is thus to channel resources in to project which yield the greatest gain in net benefit to society. Maximization of net benefit means the maximization of social utility or social welfare or private welfare in private business. Here it has been attempted to analyses the net benefits of all analysis years according to the whole udhyog. The following table how the net benefits of all years of the overall udhyog.

Table 5 it can be seen that the sales revenue is increasing trend. In this study the sales revenue has high, high and high because the expanding its market size, advertising, diversification of products, improvement of quality products, labor efficiency. The revenue earned from the sale of bakery items in market. Due to the non stability in the price of bakery item in the market and competitive nature of the market in the whole sale level the revenue earned from the target market of bakery items. It may be due to that at that time the market situation might be favorable and price also.

The information about the net benefit, it shows that the net benefit of CBU in increasing trend over the study period. Among the study periods, the maximum net benefit is Rs 243260 in year 2021 and minimums is Rs 103015 in the year 2017.

Analysis of Benefit Cost Ratio (BCR) of CBU

The benefit cost ratio (BCR) represents the ratio of total benefits over total costs of the running business. If the new project, new business and expected income in future period, the benefit cost ratio (BCR) is the ratio of the present value of benefits to the present value of costs. The total benefit of the running business is the quantity of output or sales revenue. And the total cost is the addition of all fixed costs and all variable costs inputs used in operation and production of the Udhyog.

The benefit cost ratio (BCR) is calculated as the total benefits divided by total cost in running business. The formula for calculating BCR is:

$$\text{Benefit Cost Ratio (BCR)} = \frac{Total\ benefits\ (revenue)}{Total\ costs}$$

The benefit cost ratio (BCR) is calculated as the NPV of benefits divided by the net present value (NPV) of costs in new project, new business or expected future income. The formula for calculating BCR is:

$$\text{Benefit Cost Ratio (BCR)} = \frac{PV\ (benefits)}{PV\ (costs)}$$

$$\text{Benefit Cot Ratio (BCR)} = \frac{\sum_{r=1}^{r} \frac{Bt}{(1+r)^t}}{\sum_{r=1}^{r} \frac{Ct}{(1+r)^t}}$$

The following table shows the benefit cost ratio (BCR) of the Chaudhary Bakery Udhyog on the basis of total benefits (sales revenue) and total costs.

Table 6 : Benefit Cost Ratio of Chaudhary Bakery Udhyog

Year	Total Fixed Cost (Rs)	Total Variable Cost (Rs)	Total Cost (Rs)	Total Benefit (sales revenue) (Rs)	Benefit Cost Ratio
2017	112050	1061250	1173300	1276315	1.0878
2018	117500	1365330	1473830	1629441	1.1056
2019	128900	1471020	1599920	1786665	1.1167
2020	154195	1886345	2040540	2246345	1.1009
2021	222715	2265720	2488435	2731695	1.0978

Source: Chaudhary Bakery Udhyog, 2021.

Table 6 shows the total fixed cost, total variable cost, total cost, total benefit (sales revenue) and benefit cost ratio respectively according the years of the udhyog. The benefit cost ratio (BCR) are 1.0878 : 1, 1.1056 : 1, 1.1167 :1, 1.1009 : 1 and 1.0978 : 1 in the year 2017, 2018, 2019, 2020 and 2021 respectively. Minimum BCR over the study period is 1.0878: 1 in the year 2017 and maximum BCR of udhyog for the year 2019 is 1.1167: 1. It is show that the every years BCR is greater than 1. It means the udhyog is running in profit.

Analysis of Net Present Value (NPV) of Chaudhary Bakery Udhyog

The net present value (NPV) is the current value of all project net benefits. Net benefits are simply the sum of benefits minus costs. The sum is discounted at the discount rate. Using this method, the project has a NPV greater than zero than it appears to be a good candidate for implementation. NPV is perhaps the most straight forward CBA measure. It is the sum of the discounted project benefit less discounted project costs. Using NPV as a decision rule, a project is potentially worthwhile or viable if the NPV is greater than zero; the total discounted value of benefits is greater than the total discounted costs. When comparing mutually exclusive alternatives, the alternative that yields the highest NPV would be chosen. Whilst the NPV rule is generally straight forward there are a number of issues that can arise with its use.

NPV is calculated by summing the rupees valued benefits the costs, with discounting applied to both benefits and costs are appropriate. It can be expressed as the following formula.

Net Present Value (NPV) = $\sum_{t=0}^{n} \frac{(Benefits - Costs)t}{(1+r)^t}$

Table 7: Net Present Value (NPV) of Chaudhary Bakery Udhyog

Interest rate is 9%

Year	Total Benefits (Rs)	Total Costs	Net Benefit = TB-TC (Rs)	NPV = $\sum_{t=0}^{n} \frac{(Benefits-Costs)t}{(1+r)t}$
2017	1276315	1173300	103015	94509.1743
2018	1629441	1473830	155611	130941.6022
2019	1786665	1599920	186745	144201.404
2020	2246345	2040540	205805	145797.4506
2021	2731695	2488435	243260	158102.309

Source: Chaudhary Bakery Udhyog, 2021.

Table 7 shows that the net present value (NPV) of Chaudhary Bakery Udhyog. CBU's all net present value is greater than zero. It means the total discounted value of benefits is greater than the total discounted value of costs. NPV is grater then zero, its call positive NPV. It is positive NPV indicate the udhyog is running in profit. The NPV is the current value of the udhyog net benefits. Net benefits are simply the sum of benefits minus costs. The NPV are Rs 94509.1743, Rs 130941.6022, Rs 144201.404, Rs 145797.4506 and Rs 158102.309 in the year 2017, 2018, 2019, 2020 and 2021 respectively. Minimum net present value (NPV) over the study period is Rs 94509.1743 in the year 2017 and maximum NPV of the udhyog for the year 2021 is Rs 158102.309. From this, it can be concluded that the udhyog is earning reasonable profit is study period.

Analysis of Internal Rate of Return (IRR) of Chaudhary Bakery Udhyog

The internal rate of return (IRR) is the maximum interest that could be paid for the project resources, leaving enough money to cover investment and operating costs, which would still allow the investor to break even. In other words, the IRR is the discount rate for which the present value of total benefits equals the present, value of total costs:

PV (Benefits) PV (Costs) = 0

Where,

PV (Benefits) = Present value of benefits of study period

PV (Costs) = Present value of costs of study period

In general the IRR should be greater than the discount rate for a project to be accepted.

The internal rate of return is the discount rate at which the NPV of project is equal to zero. It means discounted benefits equal to discounted costs. In algebraic terms, the

IRR is the value of r, which solves the equation:

$0 = \sum_{n=0}^{n} \frac{Bn-Cn}{(1+r)^n}$

Where,

Bn = Benefits of the study period

Cn = Costs of the study period

r = Discount rate (interest rate)

n = Evaluation period in years

A project, business is potentially worthwhile, if the IRR is greater than the discount rate applied in the evaluation. If projects, Business are mutually exclusive, this rule suggests that the project with the highest IRR should be chose.

Calculation of internal rate of return (IRR) of Chaudhary Bakery Udhyog by using following formula and related data:

The data is:

Total sales revenue (Benefits) = Rs 96,70,461

Total costs = Rs 87, 76,025

Evaluation period in year (n) = 5 year

Internal rate of return (r) =?

Now using formula,

PV (Benefits) PV (Costs) = 0

Or, $\frac{(Benefits)t}{(1+r)^t} - \frac{(Costs)t}{(1+r)^t} = 0$

Or, $\frac{96,70,461}{(1+r)^5} - \frac{87,760,25}{(1+r)^4} = 0$

Or, $1.101918124 = \frac{(1+r)^4(1+)^1}{(1+r)^4}$

Or, 1.101918124 = 1 + r

r = 0.101918124

Table 8 : Internal Rate of Return (IRR)

Years	NPV	BCR	IRR
2017	94509.1743	1.0878	10.19%
2018	130941.6022	1.1056	
2019	144201.404	1.1167	
2020	145797.4506	1.1009	
2021	158102.309	1.0978	

Source: Chaudhary Bakery Udhyog, 2021.

From the table 8, it can be found that Chaudhary Bakery Udhyog's IRR is 10.1918124%. It is represents the IRR is the discount rate at the NPV of a Chaudhary Bakery Udhyog is equal to zero. It means discounted benefits equal to discounted costs of CBU. It is the maximum interest that could be paid for the production resources, leaving enough money to cover investment and operating costs. It would still allow the udhyog to breakeven. The IRR is the discount rate for which the present value of total benefits equals the present value of total costs of the udhyog. The IRR is greater than discount rate of a CBU. So, it indicates that the udhyog is running well and earning satisfies profit.

Discussion

Ojha (2019) revealed that CBA technique is used to evaluate the investment through predicting the cash flows of the project. Economic analysis is not essential in private sector investment whereas CBA is mandatory in public sector for large investment projects. Similarly, Canzler (2012) deals with the direct and indirect benefits in monetary terms. It is necessary to prove feasible and the public money is not spent in vain. So, CBA is most important in investment because this instrument is applicable to measure social benefits. NPV and IRR techniques have been applied in this research to evaluate the cost-benefit analysis. Positive NPV and IRR greater than cost of capital reveals that Chaudhary Bakery Udhyog is running well and earning satisfied profit.

Conclusions

The research shows that the benefit cost ratio (BCR) has been found greater than 1. Hence it can be concluded that this BCR greater than 1 may be due to the longer experience and good managerial ability. BCR is greater than 1 is represents the ratio of total benefits over total costs. It is indicate the udhyog invested Rs. 1 it is earning the gain more than Rs. 1. It means udhyog is running well and earning profit.

From the cost benefit analysis, it has been found that the bakery udhyog is running in profit. In the analysis NPV is greater than zero in every year. NPV is greater than zero is

indicate that the total discounted value of benefit is greater than the total discounted value of costs. It is represent the udhyog performance is well. So, it is generating satisfactory profit in study period.

The udhyog has a internal rate of return is 10.19%. It represents the discount rate at the NPV of Chaudhary Bakery Udhyog is equal to zero. It means present value of benefits equal to present value of costs of the udhyog. The IRR is greater than discount rate. It can be concluded that the udhyog is running well and performance is better.

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