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Factors Influencing Job Satisfaction of Civil Engineers in the Local Government of Nepal

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Abstract

Job satisfaction of civil engineers plays a crucial role in enhancing the performance of infrastructure development projects. This study investigated the factors influencing job satisfaction among civil engineers in the Nepalese local government. A cross-sectional survey of purposefully selected 169 civil engineers purposefully selected from the Gandaki Province of Nepal was included in the study. Five-point Likert scale structured questionnaires were used to measure the factors influencing job satisfaction of civil engineers based on the single global rating method (SGRM) and summation of job factor method (SJFM). Regression analysis shows that pay structure, career development, supervision, fringe benefits, reward provision, operating procedures, teamwork, working environment, and communication system have a positive and significant impact on job satisfaction among the civil engineers in the local government. This study finds a low level of job satisfaction for civil engineers working at the local level of government. The productivity of civil engineers and the performance of infrastructure projects in local governments can be improved through job satisfaction techniques. Local government may adopt a job satisfaction policy for local-level engineers to enhance the construction work performance in the local government.

Keywords: *Civil engineers; construction work performance; infrastructure development; job satisfaction; local government*

1. Introduction

Civil engineers play a crucial role in promoting construction projects, infrastructure development, and sustainable construction practices (Khan & McNally, 2023). They are in charge of planning, developing, and maintaining infrastructure such as buildings, bridges, highways, and water supply systems. As essential to the development of infrastructure, civil engineers are

involved in every stage of a project, from design to supervision (Chan et al., 2004). Infrastructure projects facilitate not only economic development but also protect human health, welfare, and the environment (Fischer & Amekudzi, 2011). They deal with obstacles like dangerous natural events while operating in a variety of situations (Chan et al., 2020). It is believed that unfavorable management policies, poor working conditions, and inappropriate work practices are some of the causes of dissatisfaction among civil engineers (Kissi et al., 2023). This unhappiness can result in demotivation and careless work practices, which can damage project completion, overrun delivery of the projects, drive up costs, and impede the growth of the country (Koirala & Shahi, 2024; Titzler et al., 2018). Therefore, for a project to be successful, it is essential to comprehend and solve the circumstances of civil engineers.

Organizational culture, work-life balance, opportunities for professional growth, and the effects of community engagement affect job satisfaction (Ellickson & Logsdon, 2002; Yousef, 2017). Increasing government employee satisfaction is essential to raising citizen service quality. Dissatisfaction breeds bad work attitudes, whereas job content, a gauge of the pleasure one derives from one's work, is linked to good attitudes (Haybron, 2005). Job satisfaction in industries such as commercial banking, education, nursing, and civil service personnel has been the subject of studies conducted in Nepal (Khatri, 2022; Koirala, 2022; Shrestha, 2023). The employee's morale decreases when demotivation happens due to huge rework, problems in teamwork, delay in supervision, incompetent supervisors, working environment, and resource limitations (Khumalo, 2022; Ng et al., 2004).

Job happiness and professional fulfillment have become a top priority for people in a variety of industries due to the changing nature of today's professional environment. Of them, civil engineers have a special place in local government organizations since they are instrumental in creating the infrastructure that directly affects the communities they deal with. Job satisfaction of civil engineers at the local level of government has become a crucial issue in the Nepalese context. The purpose of this study is to examine job satisfaction among civil engineers who work at local governments, particularly at the rural and urban municipal levels. This study is relevant to exploring the insights for improving job satisfaction and productivity in local governments.

2. Literature review and hypotheses development

The literature highlights a significant correlation between workgroup factors, such as pay structure, career development, supervision, fringe benefits, reward provision, operating procedures, teamwork, working environment, communication system, and job satisfaction.

2.1 Review of key theories

Herzberg's two-factor theory is crucial for motivation that may help to enhance the productivity and performance of employees (Thant, 2023). This theory deals with hygiene and motivating factors. Hygiene factors include salary and workplace environment, which are essential to minimize dissatisfaction. Motivating factors are related to recognition and achievement. These factors completely enhance job satisfaction through positive mindsets and long-term satisfaction. Motivating factors are necessary for developing a sense of respect and value among employees

that foster the performance of the organization. A proper balance of motivating and hygiene factors creates a conducive environment and reduces dissatisfaction among employees (Herzberg, 2015).

Vroom's expectancy theory is another significant motivation concept that leads to job satisfaction. Expectancy (E → P) assumes that effort advances to performance. Likewise, instrumentality (P → O) accepts that performance contributes to rewards, and valence (V) believes the value placed on achieving the rewards (Suciu et al, 2013). These three elements are necessary to increase motivation. This theory emphasizes the significance of clear expectations, rational reward systems, and profound incentives to inspire employees in the organization. This theory has a multiplicative pattern of expectancy and value gains in expecting job behaviour and satisfaction (Kopelman, 1979).

Organizational support theory suggests that employees form a widespread perception regarding the extent to which the organization values, supports, and cares about their welfare. If employees perceive adequate support from the organization, they are more likely to be dedicated, motivated, and satisfied to perform the assigned jobs effectively (Kurtessis et al., 2017). Perceived organizational support is affected by several factors, including supervisor support, fair treatment, and recognition of efforts. A high level of perceived organizational support ensures better job satisfaction, retention of employees, and higher organizational loyalty. For this, organizations may increase the perceived organizational support through a good working environment, recognizing the contributions of employees, and providing career advancement opportunities (Eisenberger et al., 2020).

Work-life balance theory examines how people integrate and manage their professional work and personal life to support well-being and efficiency (Poelmans et al., 2008). A healthy balance between professional work and personal responsibility ensures lower stress, a high level of job satisfaction, and good health. Organizations may develop a good culture of maintaining work-life balance using flexible working environments, remote or virtual work methods, and encouraging policies. Work-life balance is crucial for the motivation and retention of employees, which leads to higher productivity of the organization (Cegarra-Leiva et al., 2012).

2.2 Review of empirical studies

Globally, job satisfaction is substantially influenced by structural progressiveness and job features. Organizational dedication, income level, job fitness, and work-life balance enhance engineers' career satisfaction. Organizational dedication is the most critical factor, followed by income level and job fitness for job satisfaction (Martínez-León et al., 2018). The literature review synthesizes national and international studies on civil engineers' job satisfaction, highlighting key factors such as compensation, work conditions, motivation, and leadership (Alaloul et al., 2020; Sahadi & Sriyono, 2022). Job satisfaction is usually affected by several factors, such as pay structure, career development, supervision, fringe benefits, reward provision, operating procedures, teamwork, working environment, and communication system. A review of each independent variable has been made about the job satisfaction of employees.

2.2.1 Pay structure and job satisfaction

Pay satisfaction is positively associated with organizational performance and negatively related to the turnover of employees (Currall et al., 2005). In Nepal's construction sector, civil engineers have moderate job satisfaction, though dissatisfaction persists regarding salaries and promotion opportunities. Factors like total experience and annual pay significantly affect job happiness (Bhatta et al., 2018). Valaei and Rezaei (2016) found that pay structure is positively related to job satisfaction. Despite lower satisfaction with compensation and promotions, most civil engineers expressed overall job satisfaction, suggesting that consulting firms should prioritize improvements in these areas (Thapa et al., 2018). The following alternative hypothesis has been selected based on the above literature:

H_1*: Pay structure of local government positively impacts the job satisfaction of civil engineers.*

2.2.2 Career development and job satisfaction

Literature underscores several factors influencing engineers' job satisfaction. A positive relationship exists between career advancement opportunities and job satisfaction (Hoff et al., 2020). Talent retention is a critical factor, especially in industries like oil and gas, where effective talent management significantly boosts job satisfaction through career development prospects (Salleh et al., 2024). Civil engineers in Nepal's irrigation sector express satisfaction with their jobs but dissatisfaction with compensation and career advancement (Paudel et al., 2019). Valaei and Rezaei (2016) found that career development is positively related to job satisfaction. Based on the above literature, the following alternative hypothesis has been confirmed:

H_2*: Career development in local government positively impacts the job satisfaction of civil engineers.*

2.2.3 Supervision and job satisfaction

Job satisfaction, organizational commitment, and HRM strategies are pivotal to both public and private organizations' success, offering insights into employee expectations and areas for improvement (Alhammadi et al., 2021). Valaei and Rezaei (2016) found that supervision is positively related to job satisfaction. Job satisfaction remains a central focus in organizational behaviour research, influencing areas like job design and supervision (Lu et al., 2012). Supervisor-rated job performance is an important contributor to job satisfaction (Alessandri et al., 2017). The following alternative hypothesis has been chosen based on the above literature:

H_3*: Supervision system of local government positively impacts the job satisfaction of civil engineers.*

2.2.4 Fringe benefits and job satisfaction

Fringe benefits increase job satisfaction. A high level of job satisfaction comes from the provision of fringe benefits that lead to the productivity of employees (Artz, 2010). Valaei and Rezaei (2016) found that fringe benefits are positively related to job satisfaction. Welfare facilities, especially transportation and hygiene, are critical for civil engineers' satisfaction, suggesting construction companies should prioritize these amenities to boost both worker satisfaction and project success

(Çelik & Oral, 2021). Based on the above literature, the following alternative hypothesis has been stated:

H_4: Fringe benefits in local government positively impact on the job satisfaction of civil engineers.

2.2.5 Reward provision and job satisfaction

The literature highlights that job satisfaction has a direct positive impact on job performance, with inadequate reward and recognition reducing satisfaction and, in turn, performance (Aung et al., 2023). Valaei and Rezaei (2016) found that contingent rewards are positively related to job satisfaction. Kalleberg (1997) found the nexus between work values and job rewards with job satisfaction. The job rewards include six dimensions of work, such as career opportunities, relationships with co-workers, resource adequacy, intrinsic, convenience, and financial variables. Likewise, Linz and Semykina (2012) found a strong relationship between reward variables and the job satisfaction of employees. The following alternative hypothesis has been postulated based on the above literature:

H_5: Reward provision of local government positively impacts the job satisfaction of civil engineers.

2.2.6 Operating procedures and job satisfaction

Operating procedures have a significant relationship with job satisfaction. Generally, employees are dissatisfied with excessive paperwork and formalities in the organization. Operating procedure policy determines the satisfaction of employees (Ansong, 2021). Likewise, Valaei and Rezaei (2016) found that operating procedures are positively related to job satisfaction. Based on the above literature, the following alternative hypothesis has been presented:

H_6: Operating procedures of local government positively impact the job satisfaction of civil engineers.

2.2.7 Teamwork and job satisfaction

Valaei and Rezaei (2016) found that co-workers and teamwork are positively related to job satisfaction. Hanaysha & Tahir (2016) found that teamwork has a substantial positive effect on job satisfaction. Teamwork increases productivity, develops creative ideas, and enhances a culture of mutual understanding and collaboration in the organization. Likewise, Musinguzi et al. (2018) stated that job satisfaction increases with consolidating teamwork. Effective teamwork is essential for job satisfaction, which ultimately leads to employee performance. The following alternative hypothesis has been proposed based on the above literature:

H_7: Teamwork in local government positively impacts the job satisfaction of civil engineers.

2.2.8 Working environment and job satisfaction

Job satisfaction varies by employee category, with engineers and architects showing the highest levels and a strong positive correlation between working environment and job satisfaction (Egemen, 2024). Likewise, Valaei and Rezaei (2016) found that the working environment is positively related to job satisfaction. Work environment and relationships significantly affect job

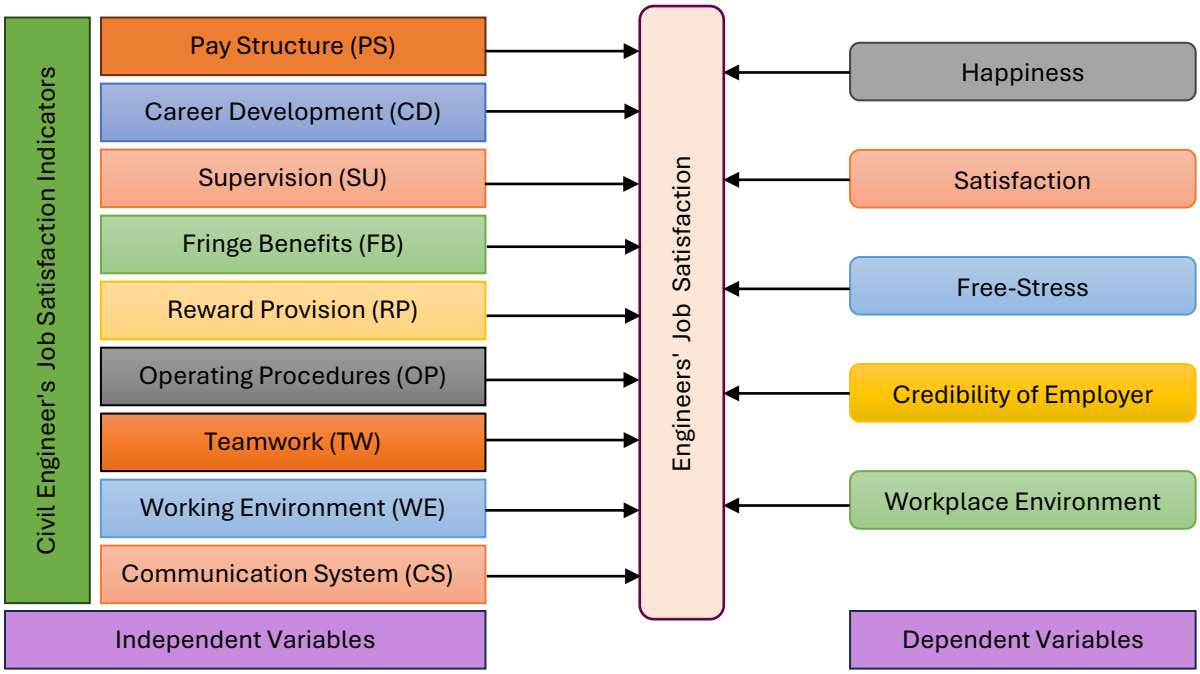
satisfaction (Anasi, 2020; Raziq & Maulabakhsh, 2015). Based on the above literature, the following alternative hypothesis has been stated:

H_8: Working environment in local government positively impacts the job satisfaction of civil engineers.

2.2.9 Communication system and job satisfaction

Valaei and Rezaei (2016) found that communication is positively related to job satisfaction. The communication culture, supervisor communication, and individual feedback are the influencing factors to enhance job satisfaction and performance (Pincus, 1986). Job satisfaction can be increased through the occurrence of a progressive communication environment (Mehra & Nickerson, 2019). Organizational communication has a positive influence on job satisfaction and employee commitment (Pongton & Suntrayuth, 2019). The following alternative hypothesis has been anticipated based on the above literature:

H_9: Communication system in local government positively impacts the job satisfaction of civil engineers.



Note: Based on the literature review.

Figure 1: Conceptual framework of research

In Figure 1, job satisfaction of civil engineers can be impacted by many factors. Job satisfaction can be measured in terms of happiness, satisfaction, free-stress, credibility of employer, workplace environment, and is hypothesized to positively correlate in this study. Pay structure, career development, supervision, fringe benefits, reward provision, operating procedures, teamwork, working environment, and communication system are the independent variables under the civil engineers' job satisfaction.

3. Research methods and data collection

This study is based on the primary data gathered by a self-administered questionnaire, through several steps, including planning, sampling, pretesting, surveying, monitoring, verifying, coding, processing, analyzing, and reporting. Surveying people's interests, views, or perceptions with a self-administered questionnaire is a common practice (Gnambs & Kaspar, 2014; Rada & Domínguez-Álvarez, 2013). The research strategy, methodology, population, and sample size, sampling process, and data collection and analysis techniques are briefly described.

As shown in Figure 2, Gandaki, one of Nepal's seven provinces, covers 21,504 km and borders the Tibet Autonomous Region of China to the north, Bagmati Province to the east, Karnali Province to the west, Lumbini Province and Bihar, India, to the south. Its provincial capital is Pokhara. With 11 districts and 85 local level administrations, 26 municipalities, 58 rural municipalities, and one metropolitan city, Gandaki makes up around 14.57% of all of Nepal.

(a) **(b)**

Figure 2: Study Area (a) Nepal's map (b) Gandaki Province

The sample for this study comprised civil engineers working at the local level in Gandaki Province. Non-probability convenience sampling was used to select participants. The population was obtained from the Ministry of Federal Affairs and General Administration (MOFAGA), the Municipal Association of Nepal (MuAN), and the National Association of Rural Municipalities in Nepal (NARMIN) in 2024.

A total population of 291 civil engineers is at the local level in Gandaki Province. The proposed sample size was 166, considering 95% confidence level, 5% variability assumed, and 5% margin of error. By allowing 5% potential non-response, the targeted sample size was determined to be 174. However, 169 complete responses were received from the local level civil engineers, so our final sample size for this study was 169.

Data was collected via a structured questionnaire survey. First, structured questionnaires were pre-tested with thirty engineers, and the questionnaires were revised based on feedback. The

value of Cronbach alpha ranges from 0.7 to 0.9, indicating good to outstanding levels of internal consistency. The structured questionnaire covers job satisfaction assessments in three sections: general profile information, job happiness using the single global rating method (SGRM), and job satisfaction for various factors. Likert scales were used to measure the level of job satisfaction of the respondents. The data were analyzed with the help of descriptive and inferential statistics, such as a correlation matrix and regression analysis.

4. Results and discussion

4.1 Demographic profile of respondents

The demographic profile of respondents includes gender, banking experience, involvement in banks, education level, designation, and specialization area of the respondents. The demographic profile of respondents has been presented in Table 1.

Table 1: Demographic profile

Demographic variables		No. of respondents	Percentage
Gender	Male	140	82.8
	Female	129	17.2
Designation	6th-level officer	80	47.3
	7th level officer	69	40.9
	8th level officer	20	11.8
Involvement	Federal government	13	7.7
	Province government	21	12.4
	Local government	135	79.9
Education level	Bachelor	139	76.3
	Master	29	22.5
	Above master	1	1.2
Experience	Up to 3 years	12	7.1
	3 to 5 years	57	33.7
	5 to 10 years	62	36.7
	More than 10 years	38	22.5
Annual income (USD)	2,500 to 5,000	109	64.5
	5,000 to 7,500	59	34.9
	7,500 above	1	0.6

Marital status	Married	116	68.6
	Unmarried	53	31.4
Job location	Office based	111	65.7
	Site based	58	34.3
Total		169	100

Note: *Calculation based on field survey 2024.*

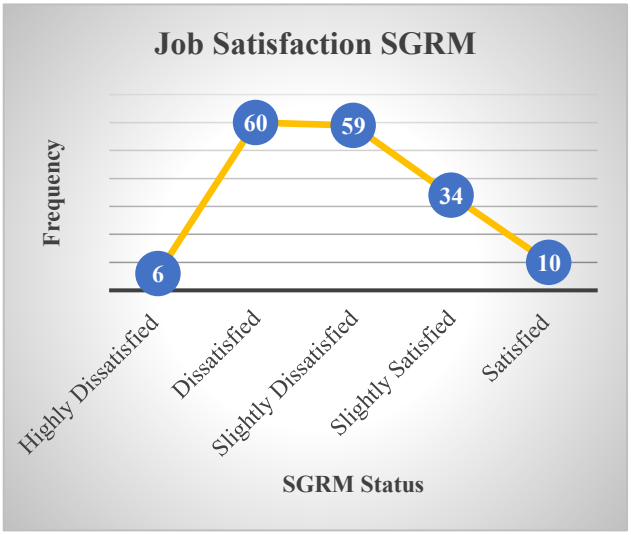
Table 1 shows that many of the respondents are male (82.89%), married (68.6%), with 6th and 7th level officers (88.25) being involved in the local level government (79.9%). The majority of the respondents have bachelor-level education (76.3%), and more than five years of experience (59.2%). Likewise, most respondents have an annual income of up to USD 5,000 and an office-based job location (65.7%).

4.2 Job satisfaction by single global rating method

The single global rating method (SGRM) is a widely used technique for measuring job satisfaction. This approach is used to rate the job satisfaction of employees, usually using a single question. It gives a common sense of employee satisfaction; however, it lacks a specific form of job satisfaction. This method is relatively cost-effective to measure the morale and active engagement of employees (Green et al., 2006). The job satisfaction of local-level civil engineers using SGRM is presented in Table 2.

Table 2: Job satisfaction of local-level civil engineers using SGRM

Job Satisfaction By SGRM	Frequency	Percent
Highly Dissatisfied	6	3.6
Dissatisfied	60	35.5
Slightly Dissatisfied	59	34.9
Slightly Satisfied	34	20.1
Strongly Satisfied	10	5.9
Total	169	100



Note: *Calculation based on field survey 2024.*

The job satisfaction levels of local-level civil engineers were examined using SGRM. The study shows that 5.9% of respondents are strongly satisfied, 20.1% slightly satisfied, 35.5% unhappy, and 3.6% severely dissatisfied. The majority of the local-level civil engineers are found unhappy, suggesting general discontent in their employment.

4.3 Job satisfaction by summation of job factor method (SJFM)

The summation of the job factor method (SJFM) measures job satisfaction through multiple traits of the job rather than on a single assessment system. It evaluates the satisfaction of employees using a standardized scale in terms of pay structure, working environment, career advancement opportunities, participative approach, supervisors' support, and work-life balance (Green et al., 2006). Table 3 shows the job satisfaction of local-level civil engineers using SJRM.

Table 3: Job satisfaction of local-level civil engineers using SJRM

Job Satisfaction By SJFM	Frequency	Percent
Highly Dissatisfied	1	0.59
Dissatisfied	8	4.73
Slightly Dissatisfied	113	66.86
Slightly Satisfied	44	26.04
Strongly Satisfied	3	1.78
Total	169	100.00

Note: *Calculation based on field survey 2024.*

Employee job satisfaction was measured by the summation of work-related variables. Table 3 shows that 26.0% of respondents were somewhat satisfied, 1.8% were satisfied, 4.7% were dissatisfied, and 0.6% were very dissatisfied. This study shows that the majority of local-level civil engineers have a low level of job satisfaction.

Descriptive statistics for job-related variables

The frequency distribution of variables connected to jobs looks at how often different characteristics occur in a dataset that has to do with jobs. It gives a concise summary of the frequency with which particular job-related variables like pay structures, career development, supervision, fringe benefits, reward provision, operating procedures, teamwork, working environment, and communication system occur within the sample population. Table 4 reflects the descriptive statistics for job-related variables.

Table 4: Descriptive statistics for job-related variables

Variable	SD	D	N	S	SS	HS	Mean	Std. Dev.
PS	3 (1.8)	42 (24.9)	107 (63.3)	13 (7.7)	4 (2.4)	0	2.734	0.624
CD	5 (3.0)	22 (13.0)	43 (25.4)	72 (42.6)	27 (16.0)	0	3.479	0.951
SU	1 (0.6)	9 (5.3)	23 (13.6)	92 (54.4)	40 (23.7)	4 (2.4)	3.877	0.844
FB	2 (1.2)	15 (8.9)	29 (17.2)	92 (54.4)	27 (16.0)	4 (2.4)	3.667	0.892
RP	5 (3.0)	31 (18.3)	81 (47.9)	46 (27.2)	4 (2.4)	2 (1.2)	3.049	0.842
OP	8 (4.7)	62 (36.7)	66 (39.1)	22 (13.0)	10 (5.9)	1 (0.6)	2.737	0.941
TW	0	4 (2.4)	21 (12.4)	81 (47.9)	53 (31.4)	10 (5.9)	3.502	1.153
WE	9 (5.3)	44 (26.0)	29 (17.2)	65 (38.5)	21 (12.4)	1 (0.6)	3.183	1.135
CS	4 (2.4)	43 (25.4)	83 (49.1)	30 (17.8)	7 (4.1)	2 (1.2)	2.942	0.882
Weighted average							3.241	0.43

Note: Calculation based on field survey 2024. The figure in parentheses is the percentage.

Table 4 shows that the mean value of pay structure, reward provision, operating procedures, working environment, and communication system is lower compared to the weighted average. It shows that local-level civil engineers are not happy with the above job satisfaction indicators. However, career development, supervision, fringe benefits, and teamwork are better at the local level of government.

4.2 Correlation matrix of Job satisfaction and Job-related variables

The relation between job satisfaction and job-related variables explores how factors like pay structure, reward provision, operating procedures, working environment, and communication system affect employees' overall satisfaction with their jobs. Understanding this relationship helps organizations optimize conditions to enhance employee well-being and productivity. The correlation matrix of job satisfaction and job-related variables is presented in Table 5.

There is a significant positive relationship between several job-related characteristics and job satisfaction (JS). With $p < 0.01$, there are strong positive relationships with "PS" ($r = 0.427$), "CD" ($r = 0.424$), "SU" ($r = 0.395$), "FB" ($r = 0.521$), "RP" ($r = 0.545$), "OP" ($r = 0.485$), "TW" ($r = 0.563$), "WE" ($r = 0.495$), and "CS" ($r = 0.513$). The results show a significant relationship between the dependent and independent variables. The significant positive correlations (all $p < 0.01$) between these variables and job satisfaction range from 0.395 to 0.563.

Table 5: Correlation matrix of job satisfaction

	JS	PS	CD	SU	FB	RP	OP	TW	WE	CS
JS	**1**	**0.427****	**0.424****	**0.395****	**0.521****	**0.545****	**0.485****	**0.563****	**0.495****	**0.513****
PS	**0.427****	1	0.410**	0.389**	0.432**	0.454**	0.408**	0.467**	0.418**	0.430**
CD	**0.424****	0.410**	1	0.370**	0.440**	0.460**	0.420**	0.475**	0.430**	0.445**
SU	**0.395****	0.389**	0.370**	1	0.410**	0.425**	0.380**	0.430**	0.395**	0.405**
FB	**0.521****	0.432**	0.440**	0.410**	1	0.530**	0.485**	0.520**	0.470**	0.490**
RP	**0.545****	0.454**	0.460**	0.425**	0.530**	1	0.495**	0.550**	0.500**	0.520**
OP	**0.485****	0.408**	0.420**	0.380**	0.485**	0.495**	1	0.490**	0.455**	0.470**
TW	**0.563****	0.467**	0.475**	0.430**	0.520**	0.550**	0.490**	1	0.505**	0.525**
WE	**0.495****	0.418**	0.430**	0.395**	0.470**	0.500**	0.455**	0.505**	1	0.495**
CS	**0.513****	0.430**	0.445**	0.405**	0.490**	0.520**	0.470**	0.525**	0.495**	1

*Note: Calculation based on field survey 2024. ** Correlation is significant at the 0.01 level (2-tailed).*

The study conducted by Paudel et al. (2020, 2019) revealed a significant positive relationship between various factors and job satisfaction among civil engineers at the Provincial level. Moreover, they found a significant relationship between several factors, such as pay structure, working environment, teamwork, and job satisfaction among local-level employees, with benefits showing the strongest and most significant relationship.

These findings emphasize the significant correlation between co-workers, pay, promotion opportunities, operating conditions, rewards and benefits, and communication with job satisfaction. The importance of factors such as effective communication, supportive supervision, fulfilling job tasks, fair compensation, growth opportunities, attractive benefits packages, positive performance appraisals, favourable working conditions, adequate tools, job security, and positive co-worker relationships in enhancing job satisfaction among civil engineers is highlighted.

The normality of the dependent variable (JS by SJFM method) was evaluated using a Kolmogorov-Smirnov (K-S) test. Contrary to what the alternative hypothesis (H1) says, the null hypothesis (H0) asserts that the data have a normal distribution. The K-S test uses a predefined significance level (e.g., a = 0.05) to compare the observed data to a normal distribution and determine whether there is sufficient evidence to reject the null hypothesis in favour of the alternative hypothesis. The p-value and test statistic obtained from this comparison help us make this determination.

The Kolmogorov-Smirnov test p-value in Table 6 is 0.200, above the significance level of 0.05. The dependent variable (JS by SJFM) does not follow a normal distribution, so the null hypothesis that it cannot be rejected. This suggests that a reasonable assumption about the data's distribution is that it is normal.

Table 6: Tests of normality of the dependent variable

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
JS	0.051	169	0.200*	0.986	169	0.058
*. This is a lower bound of true significance.						
a. Lilliefors Significance Correction						

Note: Calculation based on field survey 2024.

4.3 Regression analysis

A multiple regression analysis was conducted to examine the impact of various job-related factors on job satisfaction. Job satisfaction served as the dependent variable, while independent variables included pay structure, reward provision, operating procedures, working environment, and communication system. The analysis aimed to ascertain the direction and impact of these factors on job satisfaction, providing insights into the key determinants of job satisfaction. Before running the multiple linear regressions, the essential assumptions were verified to run the regression. The job satisfaction of civil engineers has been expressed in the following regression model:

$$\mathrm{JS} = \beta 0 + \beta_1 \mathrm{PS} + \beta_2 \mathrm{CD} + \beta_3 \mathrm{SU} + \beta_4 \mathrm{FB} + \beta_5 \mathrm{RP} + \beta_6 \mathrm{OP} + \beta_7 \mathrm{TW} + \beta_8 \mathrm{WE} + \beta_9 \mathrm{CS}$$

Table 7: Regression analysis

Variables	Beta	T-value	Sig.	VIF
(Constant)	-0.353	-1.754	.021	---
PS	.143	3.187	.002	1.114
CD	.208	4.126	.000	1.403
SU	.168	3.560	.000	1.225
FB	.149	3.045	.003	1.322
RP	.244	4.592	.000	1.552
OP	.206	3.888	.000	1.551
TW	.250	5.366	.000	1.196
WE	.215	4.830	.000	1.093
CS	.210	4.397	.000	1.261
R-square: 0.712	Adjusted R-square: .695		F-value: 43.592	P-value: 0.000

Note: Calculation based on field survey 2024.

a. Dependent Variable: Job satisfaction (JS)

Based on the above regression results, all the independent variables - pay structure, reward provision, operating procedures, working environment, and communication system have a positive and significant impact on job satisfaction of civil engineers in the local level government. The research examines those factors that influence the job satisfaction of civil engineers in local government, and from the regression analysis, most of the variables showed a significant relationship at the 0.01 level, thus supporting the hypotheses.

H_1 states that job satisfaction is influenced by the pay structure of civil engineers in the local government (β = 0.143, T = 3.187, Sig. = 0.002). This result is consistent with the findings of Maciej et al. (2013) and Wang and Brower (2018), who postulated that pay is one of the main factors affecting job satisfaction. H_2 states that career development significantly influences job satisfaction, with β = 0.208, T = 4.126, Sig. = 0.000. In this regard, Wang and Brower (2018) also noted that opportunities for career advancement significantly motivate employees. H_3 states that supervision has a significant effect on job satisfaction (β = 0.168, T = 3.560, Sig. = 0.000). Maldrine and Kiplangat (2020) support this, observing that effective supervision enhances morale and satisfaction.

H_4 states that fringe benefits have a positive effect in bringing job satisfaction with β = 0.149, T = 3.045, Sig. = 0.003. This result is supported by Nisar and Siddiqui (2019), who address the role of benefits. H_5 states that there is a significant impact of reward provision on job satisfaction (β = 0.244, T = 4.592, Sig. = 0.000). This contrasts with Jayarathna (2014) expectancy theory, suggesting further exploration of contextual influences. H_6 states that operating procedure significantly influences job satisfaction (β = 0.206, T = 3.888, Sig. = 0.000), consistent with Trismiyanti et al. (2020), who underline the value of clear policies and processes.

H_7 states that teamwork positively impacts job satisfaction significantly with β = 0.210, T = 4.397, Sig. = 0.000. Again, it goes back to Hamidaton et al. (2023), who discussed the issue of mutual support. H_8 states that the working environment significantly impacts job satisfaction; as such, β = 0.215, T = 4.830, Sig. = 0.000. According to Hackman and Oldham (1976), a profound working environment has an intrinsic value in job satisfaction. H_9 states that the communication system significantly affects job satisfaction, with β = 0.250, T = 5.366, Sig. = 0.000, consistent with Meintjes and Steyn (2006), who identify communication as key to organizational success.

The findings reveal that pay, promotion, supervision, fringe benefits, operating procedures, co-workers, the nature of work, and communication satisfaction significantly influence job satisfaction among civil engineers. These results align with Herzberg's two-factor theory, as stated by Wedadjati and Helmi (2022), which highlights intrinsic and extrinsic factors in job satisfaction. Reward provision has a significant effect, which might be because of cultural or contextual moderating effects. This finding is inconsistent with Deci and Ryan (2013), who argue that material rewards are indeed motivating factors. An adjusted R-square value of 0.695 denotes that this model explains a substantial variance in job satisfaction, bolstered by robust predictors with multicollinearity diagnostics less than 2. Thus, these findings are consistent with those of Ismajili (2012) and Ismajli et al. (2015) and confirm the critical nature of pay structure,

supervision, and communication, although Hackman and Oldham (1975) place emphasis to the working environment. Based on the above discussion, organizational and interpersonal factors are the key elements enhancing civil engineers' job satisfaction at local government levels.

5. Conclusion and policy implications

This research identified the important factors that influenced job satisfaction among civil engineers in Gandaki Province, Nepal, which are pay, promotion, supervision, fringe benefits, operating procedures, co-workers, the nature of work, and communication. A significant proportion of the respondents were relatively dissatisfied, reflecting a wider systemic problem in the local government context. It can be concluded that pay structure, career development, supervision, fringe benefits, reward provision, operating procedures, teamwork, working environment, and communication system have a positive and significant impact on job satisfaction among the civil engineers in the local government. Payment structure was judged to be the least satisfying component, whereas teamwork was the most. This study finds a low level of job satisfaction for civil engineers working at the local level government. The productivity of civil engineers and the performance of infrastructure projects in local governments can be improved through job satisfaction techniques. A holistic policy intervention enriching organizational and interpersonal dimensions that may help to improve job satisfaction among civil engineers. Local government may adopt a job satisfaction policy for local level engineers to enhance the construction work performance in the local government.

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