STUDY OF FACTORS CAUSING DELAYS IN BUILDING PROJECT IMPLEMENTATION IN PASAMAN DISTRICT

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Abstract:*Very important for contractor For finish work appropriate time, because matter That will profitable for owners, contractors, consultants and other parties who play a role in activities. And vice versa lateness work will very influential to reputation contractor. Objective study that is For Identify factors determine factor become dominant reason lateness implementation project buildings in the district Pasaman. Method research used that is method study in a manner quantitative that is with spread questionnaire to para respondent. Results research conducted there are 9 factors reason delay that occurred on project building in the District Passover that is that is factor Power Work, factor Managerial, Monitoring Evaluation factors, factors implementation Occupation, factor Location, factor Other, factor Characteristics Place, factor Environment, factor Constraint Implementation*.

Keywords: *Delays, Factors, Building, Project, Pasaman*

A. Introduction

Project success is the main target for companies operating in the construction services sector. A project that is said to be successful is a reflection of the work of the contractor company. A project is said to be successful if the project can be completed at the specified cost, can be completed on time or even faster than the scheduled time, and with the specified quality achieved. The impact of project success will raise the image of the contractor company (Christiawan, 2014).

It is very important for contractors to complete work on time, because this will benefit the owner, contractor, consultant and other parties who play a role in the activity. And conversely, delays in work will greatly affect the contractor's reputation. Owners will usually entrust more construction activities to contractors who excel and have a good reputation. So punctuality of work can be said to be a necessity for contractors in order to gain the trust of the activity owner (Civronlit, 2016).

In recent years, a number of building construction projects in Pasaman district have experienced delays due to work not being completed on time. Sanctions are also imposed on service providers due to their negligence in implementing the project. There are 6 late building projects in 2017, namely the continuation of the construction of the prayer room for the Pasaman Regent's Office, the construction of the official residence of the Deputy Regent of Pasaman, the heavy rehabilitation of the official residence of the Chairman of the Pasaman DPRD, the heavy rehabilitation of the official residence of the District Regional Secretary. Pasaman, Heavy Rehabilitation of the UDKP Bonjol Building (Continued 2016), and North Rao Multi-Purpose Development (Continued 2016). The average weight of delay is 19% to 14%. There are 2 building projects that are late in 2021, namely the continuation of the heavy rehabilitation of the Pasaman district DPRD office and the construction of the Regional Health Lab Building. The weight of delays was 33% and 31% so that in the end the project lost contact. The total building projects that are late in 2017 and 2021 are 8 projects.

The cause of delays in building projects in Pasaman Regency is due to poor project management, many workers who are less skilled and have less experience in the field, in terms of capital, contractors tend to rely more on waiting for the final payment in carrying out work, not maximizing the use of current project finances. Running, so that work delays often occur which results in delays in completing work (Pasaman Regency PUPR Department, 2021).

In previous research conducted by Fredy (2018), the main factors causing project delays were. In the scope of Government projects, the 3 dominant factors that influence construction project delays are weather, labor, and design. In the scope of private projects, the 3 dominant factors that influence delays in construction projects are weather, materials and finance.

Triarman (2018) in the journal Analysis of Factors Causing Time Delays in Upper Structure Work on Construction Projects, the causes of time delays for upper structure work are first: the number of reinforcement factors that do not match the design, the second is the factor that the quality of the material used is not good, the third is: The material factor does not comply with specifications, the fourth is the factor of errors in work procedures, and the fifth is the factor of unskilled workers.

Anna (2018) in the journal Factors Causing Delays in Implementation of Construction Project Work in Manokwari Regency. The most influential sub-factors on the ten delay factors based on factor analysis are the sub-factor of inadequate number of workers, sub-factor of delays in availability of materials, sub-factor of equipment damage, sub-factor of surface conditions and below ground level, sub-factors of late payment of salaries to employees, sub-factors of prolonged rainfall intensity, sub-factors of changes in working time by contractors, sub-factors of changes in the scope of work at the time of implementation, sub-factors of inaccurate determination of the duration of working time, sub-factors processes and procedures for evaluating work progress over a long period of time and through an agreed schedule.

Delays are something that really needs to be paid attention to and are a top priority in the planning and implementation stages of the project. Therefore, efforts are needed to analyze and research more deeply the factors that can cause delays in the implementation of construction projects.

Because factors and variables have not yet been obtained, which will cause delays, research needs to be carried out. Apart from the factors and variables found in the field, there are many more factors and variables that must be looked for which will cause project delays. Therefore, the author is interested in raising this problem in a scientific work with the title Study of Factors Causing Delays in Implementation of Building Projects in Pasaman Regency.

B. Methods

In this research the author used a quantitative research method, namely by distributing questionnaires to respondents. The selected respondents were owners, consultants and contractors involved in construction projects in Pasaman district.

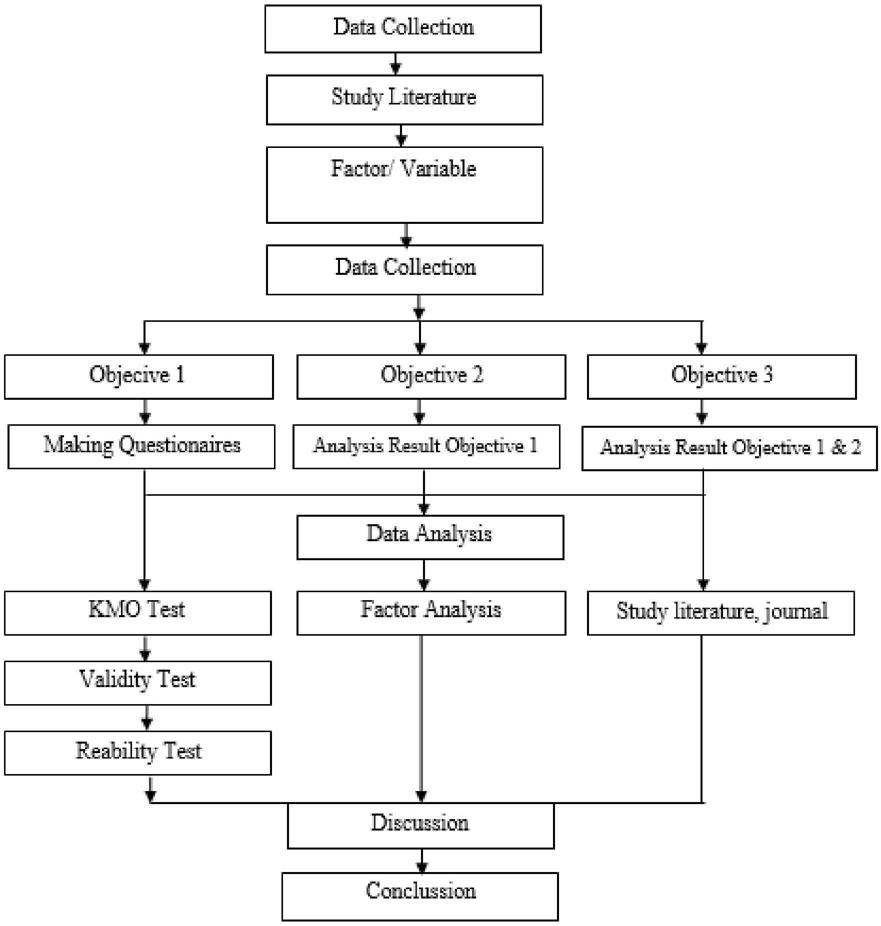

Figure 1. Research Methodology Flow Diagram

C. Results and Discussion

Objective 1

Assumption Test / KMO (Kaiser Mayer Oiken) and Bartlett's

To find potential causes that form the main problem, the KMO (Kaiser Mayer Oiken) and Bartlett's tests are carried out which are useful for determining the suitability of each variable to be tested.

Table 1. Uji Asumsi /KMO

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.678
Bartlett's Test of Sphericity	Approx. Chi-Square	877.624
	Df	325
	Sig.	.000

The test results shown in Table 1 show that the KMO and Bartlett's Test of Sphericity value is 0.678, which is above 0.50, with a significance of 0.000, which is below 0.05. It is stated that the sample has met the requirements and the analysis can continue.

Variable Validity Test
With a total of 100 respondents, the r table value is 0.1966

Table 2. Validity Test

No	Variable	Value r Calculate	r Value Table	Significance	Decision
1	X1a	0,578	0,1966	0,000	Valid
2	X1b	0,410	0,1966	0,000	Valid
3	X1c	0,715	0,1966	0,000	Valid
4	X1d	0,471	0,1966	0,000	Valid
5	X1e	0,518	0,1966	0,000	Valid
6	X1f	0,653	0,1966	0,000	Valid
7	X1g	0,543	0,1966	0,000	Valid
8	X2a	0,688	0,1966	0,000	Valid
9	X2b	0,769	0,1966	0,000	Valid
10	X2c	0,652	0,1966	0,000	Valid
11	X3a	0,648	0,1966	0,000	Valid
12	X3b	0,615	0,1966	0,000	Valid
13	X3c	0,649	0,1966	0,000	Valid
14	X3d	0,689	0,1966	0,000	Valid
15	X4a	0,459	0,1966	0,000	Valid
16	X4b	0,468	0,1966	0,000	Valid
17	X4c	0,354	0,1966	0,000	Valid
18	X4d	0,420	0,1966	0,000	Valid
19	X4e	0,716	0,1966	0,000	Valid
20	X4f	0,534	0,1966	0,000	Valid
21	X4g	0,672	0,1966	0,000	Valid
22	X4h	0,483	0,1966	0,000	Valid
23	X5a	0,753	0,1966	0,000	Valid
24	X5b	0,613	0,1966	0,000	Valid
25	X5c	0,653	0,1966	0,000	Valid
26	X5d	0,593	0,1966	0,000	Valid
27	X5e	0,552	0,1966	0,000	Valid
28	X6a	0,632	0,1966	0,000	Valid
29	X6b	0,602	0,1966	0,000	Valid
30	X6c	0,602	0,1966	0,000	Valid

Reliability Test
An instrument is said to be reliable if Cronbach's Alpha is more than ≥ 0.60. (Ghozali in Masril, 2014). The results of the reliability test in this research can be seen from the following table:

Table 3. Reliability Test Results

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.836	.831	30

Based on the reliability statistics table above, it can be seen that the Cronbach's Alpha value is 0.836 ≥ 0.60 so it can be said that the research is reliable.

Objective 2
Measure Of Sampling Aduquaecy (MSA)
The results of the factor analysis carried out were obtained by the Measure of Sampling Adequacy (MSA) value in the anti-image matrix table, which is as follows:

Table 4. Recapitulation of Measure of Sampling Adequacy (MSA) Values

No	Variable	MSA Value	Information
1	X1a	0,569	Variables worth using
2	X1b	0,469	Variable is not suitable for use
3	X1c	0,667	Variables worth using
4	X1d	0,593	Variables worth using
5	X1e	0,774	Variables worth using
6	X1f	0,663	Variables worth using
7	X1g	0,547	Variables worth using
8	X2a	0,454	Variable is not suitable for use
9	X2b	0,565	Variables worth using
10	X2c	0,592	Variables worth using
11	X3a	0,595	Variables worth using
12	X3b	0,664	Variables worth using
13	X3c	0,669	Variables worth using
14	X3d	0,713	Variables worth using
15	X4a	0,621	Variables worth using
16	X4b	0,576	Variables worth using
17	X4c	0,513	Variables worth using
18	X4d	0,492	Variable is not suitable for use
19	X4e	0,692	Variables worth using
20	X4f	0,484	Variable is not suitable for use
21	X4g	0,651	Variables worth using
22	X4h	0,720	Variables worth using
23	X5a	0,699	Variables worth using
24	X5b	0,631	Variables worth using
25	X5c	0,662	Variables worth using
26	X5d	0,684	Variables worth using
27	X5e	0,610	Variables worth using
28	X6a	0,644	Variables worth using
29	X6b	0,714	Variables worth using
30	X6c	0,613	Variables worth using

Of the 30 variables, 26 variables produced MSA values above 0.50, only 4 variables below 0.50, namely X1b, X2a, X4d, X4f, because there are invalid variables, a second MSA test is carried out and the invalid variables are removed.

Table 5. Recapitulation of Second Test Measure of Sampling Adequacy (MSA) Values

No	Variable	MSA Value	Information
1	X1a	0,591	Variables worth using
2	X1c	0,676	Variables worth using
3	X1d	0,643	Variables worth using

4	X1e	0,799	Variables worth using
5	X1f	0,649	Variables worth using
6	X1g	0,705	Variables worth using
7	X2b	0,623	Variables worth using
8	X2c	0,694	Variables worth using
9	X3a	0,677	Variables worth using
10	X3b	0,676	Variables worth using
11	X3c	0,684	Variables worth using
12	X3d	0,683	Variables worth using
13	X4a	0,668	Variables worth using
14	X4b	0,578	Variables worth using
15	X4c	0,587	Variables worth using
16	X4e	0,662	Variables worth using
17	X4g	0,586	Variables worth using
18	X4h	0,767	Variables worth using
19	X5a	0,748	Variables worth using
20	X5b	0,692	Variables worth using
21	X5c	0,787	Variables worth using
22	X5d	0,685	Variables worth using
23	X5e	0,664	Variables worth using
24	X6a	0,643	Variables worth using
25	X6b	0,756	Variables worth using
26	X6c	0,556	Variables worth using

Communalities

The second stage of factor analysis is Communalities. Based on the results of the analysis that has been carried out, a summary of the results is found as shown in Table 6.

Table 6. Communalities

Communalities		
	Initial	Extraction
X1a	1.000	.694
X1c	1.000	.759
X1d	1.000	.564
X1e	1.000	.747
X1f	1.000	.673
X1g	1.000	.598
X2b	1.000	.714
X2c	1.000	.722
X3a	1.000	.752
X3b	1.000	.742
X3c	1.000	.609
X3d	1.000	.681
X4a	1.000	.745
X4b	1.000	.740
X4c	1.000	.564
X4e	1.000	.709
X4g	1.000	.676
X4h	1.000	.532
X5a	1.000	.692
X5b	1.000	.778
X5c	1.000	.599
X5d	1.000	.667
X5e	1.000	.651
X6a	1.000	.698
X6b	1.000	.758
X6c	1.000	.712

From the table above, there are 26 variables remaining that have a correlation coefficient value of > 0.50 which can explain the factors formed, provided that the greater the communalities value, the closer the relationship between the variables in question and the factors formed.

Factor Analysis

Explaining Values *Variance* (*Total Variance Explained*)

Total variance explained, Total Variance Explained is an analysis used to see the optimal number of factors in explaining the variance of 26 variable items. Based on the analysis that has been carried out, a summary of the results is found as shown in table 4.8:

Table 7. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.327	20.489	20.489	5.327	20.489	20.489
2	2.628	10.107	30.596	2.628	10.107	30.596
3	2.094	8.055	38.651	2.094	8.055	38.651
4	1.814	6.976	45.627	1.814	6.976	45.627
5	1.443	5.550	51.177	1.443	5.550	51.177
6	1.213	4.667	55.844	1.213	4.667	55.844
7	1.186	4.563	60.407	1.186	4.563	60.407
8	1.057	4.065	64.472	1.057	4.065	64.472
9	1.012	3.891	68.363	1.012	3.891	68.363
10	.919	3.536	71.899			
11	.845	3.249	75.148			
12	.775	2.981	78.129			
13	.748	2.876	81.005			
14	.665	2.559	83.564			
15	.632	2.430	85.994			
16	.546	2.102	88.095			
17	.482	1.853	89.948			
18	.436	1.678	91.626			
19	.390	1.499	93.125			
20	.358	1.379	94.504			
21	.326	1.255	95.759			
22	.296	1.137	96.896			
23	.233	.896	97.792			
24	.226	.869	98.662			
25	.176	.677	99.339			
26	.172	.661	100.000			

From the table above, it can be seen that the variables analyzed can be grouped into 9 factors, namely those that have eigenvalues that show a number greater than one. A correlation figure below 0.5 indicates a weak correlation, while above 0.5 indicates a strong correlation.

Matrix Rotation Analysis

Based on the results of the tests that have been carried out, 24 items can be seen that form the factors causing delays that occur on building projects in Pasaman Regency, as shown in Table 4.9.

Table 8. Rotated Component Matrix

	Component								
	1	2	3	4	5	6	7	8	9
X1a	-.080	.197	-.073	.730	-.260	-.148	.117	-.075	.033
X1c	.401	.288	.409	.322	-.283	.188	.159	.103	.305
X1d	-.060	.383	.072	.220	.023	-.208	-.001	-.043	.561
X1e	.771	.148	.051	.111	.273	.115	.160	.015	-.039
X1f	.130	.183	.004	.682	.189	.032	.013	.346	.003
X1g	.118	.657	.056	.265	-.156	-.031	-.090	.157	-.144
X2b	-.115	.167	-.170	.120	-.161	.195	.552	.454	-.233
X2c	.288	.049	-.006	-.023	-.040	.630	-.179	.435	-.127
X3a	.090	.521	-.383	-.169	.355	.235	.331	.076	-.006
X3b	.436	.152	.219	.142	.295	.091	.101	-.061	-.593
X3c	.054	.710	.192	.014	.106	.048	.054	-.126	.181
X3d	-.255	.534	.314	.247	.375	-.024	.148	.071	-.049
X4a	.264	.146	-.011	.013	.797	.105	-.035	.066	-.034
X4b	-.103	.016	.302	.212	.175	.734	.071	-.065	-.120
X4c	-.020	-.011	-.009	.690	.129	.214	.093	-.113	.055
X4e	.138	.100	.751	-.048	.157	.113	.067	.269	.001
X4g	.051	.115	.800	-.053	-.058	.077	.031	.064	-.055
X4h	.090	.583	.006	.057	.126	.016	.247	.287	.147
X5a	.352	-.066	.280	.065	.557	.172	.352	.081	-.105
X5b	.191	.147	.065	.039	.046	.064	.831	-.118	-.061
X5c	.156	.011	.164	.240	.170	.105	.594	.148	.274
X5d	.364	.200	-.150	.044	.469	.156	.167	.081	.437
X5e	.410	.130	.298	-.248	.148	-.133	-.045	.523	.025
X6a	.808	-.042	.067	-.090	.121	.017	.098	-.056	-.052
X6b	.102	.006	-.003	-.019	.104	.808	.271	-.091	.038
X6c	-.172	.067	.317	.074	.088	-.020	.068	.745	.070

From table rotated component matrix then if the variable value is taken > 0.50, it is said to influence the factor or is also called a forming factor.

Dominant Factor

Based on factor analysis, the dominant factor was obtained which was the cause of delays that occurred in building construction projects in Pasaman Regency, which can be seen from the value of % of variance Rotation Sum of Squared Loadings on the 9 factors formed, namely factor 1 (one) value of % of variance produced is 20.489%, factor 2 (two) 10.107%, factor 3 (three) 8.055%, factor 4 (four) 6.976%, and factor 5 (five) 5.550%, factor 6 (six) 4.667%, factor 7 (seven) 4.563%, factor 8 (eight) 4.065%, factor 9 (nine) 3.891%. So the dominant factor is factor 1, namely the Labor factor.

Tabel 9. Rotation Sum of Squared Loadings

Rotation Sums of Squared Loadings	
Component	% of Variance
1	20.489
2	10.107
3	8.055
4	6.976
5	5.550
6	4.667
7	4.563
8	4.065
9	3.891

Table 10. The Most Important Factors Contributing to Delays

No	Factor	Variable
1	Labor	- There is a replacement of new workforce - Employees do not want to wear safety belts/safety devices

Objective 3

The concept for overcoming building project delays in Pasaman Regency using the PDCA method was then submitted to 3 experts.

Table 11. PDCA Method

Experts I	Experts II	Experts III
Causes of delay: 1. The contractor does not have a permanent workforce. 2. The contractor does not have permanent members starting from the Manager down to the smallest. 3. Unstable material prices and the existence of subcontractors from contractors to carry out project work. 4. The selection of tender winners was not good so the winners were drawn from contractors who had no experience. 5. The site manager in the field is not professional. 6. Not having sufficient finances to manage ongoing projects.	Causes of delay: 1. The workers used lack expertise and do not have sufficient skills. 2. The field implementers in the contract documents do not match those employed in the field when the project started. 3. Delay in delivery of manufactured materials or natural materials from suppliers 4. It is difficult to obtain natural and manufactured materials. 5. There is a design review proposed by the owner 6. Most contractors wait for the down payment term before starting work.	Causes of delay: 1. The field personnel in the field do not match those offered in the contract, the personnel appointed should be the personnel who were passed in the tender evaluation process. 2. Work in progress is not handled by people with special skills to carry out the work. 3. Workers employed in the field do not have sufficient expertise or skills. 4. The contractor did not carry out good management in carrying out the ongoing work. 5. The contractor does not have enough cash flow to start the project, hoping for a down payment. 6. A design review occurs.

Solution: 1. The contractor must have a permanent workforce, because currently many workers only work during the contract. 2. Contractors train new workers until they have expertise and skills and are then given expertise certificates. 3. The field manager/site manager must be a permanent person belonging to the company who has been trained and has a certificate of expertise. 4. Contractors must provide training and enlightenment regarding the need to use personal protective equipment for safety when carrying out work on the project. 5. Contractors must provide training to workers to implement K3 and wear PPE in the field. 6. Must have sufficient cash flow of at least 30% of the total projects undertaken.	Solution: 1. In the future, project workers must have certification. If craftsmen or workers are certified, their professionalism is likely to be higher, so the possibility of delays can be minimized. 2. Field implementers must always be in the field to cross check the work every day and must pay attention to the planned schedule and realization schedule for the work. 3. In the future, project workers must have certification. If craftsmen or workers are certified, their professionalism is likely to be higher, so the possibility of delays can be minimized. 4. The personnel in the field must be in accordance with those stated in the contract. 5. Regarding the issue of safety belts, it is now required in the tender document for implementing SMK3 in the field, so providers who employ workers must comply with the SMK3 regulations in the contract. 6. Currently, sanctions have been implemented for workers who do not wear PPE in the field, and K3 has been budgeted for in the Budget Plan (RAB). 7. Employees involved in the field must be given awareness to use safety bells as a safety device for themselves because safety devices must be implemented as regulated in the labor law, PUNO.10 of 2021 concerning SMK3. 8. Regarding finances, you	Solution: 1. From the start, partners have been required to prepare personnel in the field in accordance with existing regulations during the process of procuring goods and services. Participants who are appointed as winners must prepare personnel who have passed the tender evaluation process. 2. Personnel placed in the field must be personnel who have expertise in their respective fields in accordance with the requirements requested in the goods and services procurement process. 3. The most important thing is that managers within the company themselves manage the time for carrying out activities in the field, make a good time schedule, organize the company to achieve the progress that has been determined. 4. Executors in the field must have an important role in organizing activities in the field. If problems occur, the executor must be able to reschedule and review each activity to catch up with work. 5. The role of the department/owner who appoints a supervisory consultant as a field supervisor is to really pay attention to the work contract and schedule to see whether it is in accordance with the realization in the field. 6. For craftsmen, head craftsmen, foremen and

	must have initial capital of at least 30% of the value of the contract being worked on.	workers must have the ability and professionalism in accordance with the expertise certificate they have. 7. RK3 workers are provided with socialization to understand the importance of using PPE when carrying out work as a tool to protect themselves from work accidents that occur. 8. Contractors must implement organized, well-structured management. 9. The contractor must have sufficient cash flow before starting the project, at least 30% of the total project undertaken.

D. Conclusions

The conclusions from this research are:

1. The results of the research carried out show that there are 9 factors that cause delays that occur on building projects in Pasaman Regency, namely Labor factors, Managerial factors, Monitoring Evaluation factors, Work Implementation factors, Location factors, Other factors, Place Characteristics factors, Environmental factors, Implementation Obstacles factors .
2. The dominant factor causing delays that occur on building projects in Pasaman district is the labor factor.
3. The solution to overcome delays in building projects in Pasaman district is: Future project workers must have certification; Personnel in the field must be in accordance with those stated in the contract; Providers who employ workers must comply with the SMK3 regulations contained in the contract; Currently, sanctions have been implemented for workers who do not wear PPE in the field; Workers in the field must have an K3 certificate; Managerial within the company itself can manage time in carrying out activities in the field, create a good time schedule, organize the company to achieve predetermined progress; Executors in the field must have an important role in organizing activities in the field. If problems occur, executors must be able to reschedule and review each activity to catch up with work; The supervisory consultant must supervise the implementation of the activity program in accordance with the contract and schedule that has been determined; The Department as the owner also has an important role in supervising the progress of the activity program in accordance with the contract and schedule that has been determined; Contractors must have a permanent workforce, because currently many workers only work on contract.

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