

Effects of the Implementation of Road Widening Project in the Province of Sorsogon

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Abstract— This study assessed the extent of effects of the implementation of road widening projects in the province of Sorsogon from 2016 to 2019. Specifically, it sought answers to the following questions: 1. What is the extent of effects of the implementation of road widening project as perceived by the respondents in terms of: efficiency, effectiveness, equity, ethics, economy and environment; 2. Is there a significant difference in the perceptions of the respondents along the identified variables; 3. What are the problems met in the implementation of the project? And 4. What could be proposed based from the results of the study? This study made use of the descriptive correlational-survey method with questionnaire as the main research instrument. It involved 240 respondents composed of DPWH engineers, Local Government Units Officials and members of the community who were purposively selected. The statistical tools utilized were the Chi-square, weighted mean, frequency and ranking. Based from the data collected, the researcher arrived at the following conclusions: the effects of the implementation of road widening project as perceived by the respondents in terms of efficiency, effectiveness, equity, ethics, economy and environment were all interpreted as moderately effective: the perceptions of the three groups of respondents did not differ significantly on the effects of implementation of the road widening project along the identified variables: the problems met in the implementation of the road widening project to include resettlement of households that were affected by the road expansion, settlement of the right-of-way to registered residential lots and peace and order during construction were affected by external group: the convergence plan was designed in order to improve the implementation of the road widening project in the province of Sorsogon. In light of the foregoing conclusions, the following recommendations were offered: the DPWH to maintain a databank of proposed road widening project with resettlement, right-of-way and other issues for appropriate action before the implementation date of the project: the DPWH may continuously coordinate with the affected LGUs, barangay officials and community regarding the road widening project in order to maintain the understanding and acceptance of the project: the DPWH to provide support to stakeholders before and after the implementation of the road widening project to address misinformation and commotion: the proposed intervention may be submitted for review and evaluation to concerned authorities prior to its implementation to solve the most critical dilemma encountered by the affected household caused by the road widening and further study may be conducted to cover the entire region so as more respondents will be involved in the study. Also, other areas related to road management can be included in the study.

Keywords— extent of effects, implementation, perceptions, road widening.

I. INTRODUCTION

Roads are as common as humans. They have increasingly become developed as humans explored their environment in search for advancement and progress. During pre-historic age, there were only trails and rugged roads but as civilization progresses, so did the status and people have since relied on cars for transportation. Roads are meant to facilitate mobility for people and goods. And better roads are strongly associated with bigger trade flows. The improvement of infrastructure, specifically road widening projects, has a positive economic and social development impact. The ability of countries to participate in global and regional production and distribution networks depends a great deal on efficient transport and logistics infrastructure. The high number of transports urged the department to improve their projects and even implement programs for the welfare of the public. In fact, the government intends to provide immediate access to safe and reliable road

network systems, thus, proposed programs to be implemented by the DPWH. The province of Sorsogon is a recipient of numerous projects for the last four years amounting to billions of pesos and these include road widening projects along Daan Maharlika Road. There are a total of 19 road widening projects implemented by the DPWH from 2016 – 2019 and these projects are located at the towns of Castilla, Casiguran, Irosin, Juban, Matnog and Sorsogon City. One of the issues that the DPWH encountered is the delay in the implementation of some of these road projects. The problem occurs because of natural calamities that strike Sorsogon, especially it being one of the most often pathway of typhoons. Another reason is the “tree-line rule” set by then DPWH Secretary Singson in his memorandum on the implementation of road widening projects without resorting to tree cutting. And another problem which is considered the biggest to settle is the issue on the road right-of-way. As the population of

Sorsogon province continues to grow, the intensity of the traffic and pedestrians crossing has increased significantly and there is no scope for increasing the road length and widening due to land acquisition problem especially at junctions in multiple directions. For a variety of reasons such as population, economic and auto ownership growth, increasing traffic demand can exceed the carrying capacity of the road during peak periods and as a consequence, traffic condition deteriorates and safety risk worsens. As the national government invested billions of pesos for these projects, the researcher wants to look at the extent of effects of the implementation of road widening project implemented by the DPWH in the province of Sorsogon. It will meticulously examine the effects of implementation along the different aspects as well as the efficiency and effectiveness of the project.

II. STATEMENT OF THE PROBLEM

Research Questions

This study assessed the extent of effects of the implementation of road widening project in the province of Sorsogon from 2016 to 2019.

Specifically, it sought answers to the following questions:

1. What is the extent of effects of the implementation of road widening project as perceived by the respondents in terms of:
 - a. efficiency
 - b. effectiveness
 - c. equity
 - d. ethics
 - e. economy
 - f. environment
2. Is there a significant difference in the perceptions of the respondents along the identified variables?
3. What are the problems met in the implementation of the project?
4. What could be proposed based from the results of the study?

III. OBJECTIVES OF THE STUDY

The objective of the study is to assess the extent of effects of the implementation of road widening project in the province of Sorsogon. Specifically, it aims to:

1. assess the extent of effects of implementation of road widening project as perceived by the

respondents in terms of efficiency, effectiveness, equity, ethics, economy and environment.

2. determine if there is a significant difference in the perceptions of the respondents along the identified variables.
3. find out if there are problems encountered in the implementation of the project
4. propose action plan based from the results of the study.

IV. METHODOLOGY

This study used the descriptive correlational-survey method of research as it assessed the extent of effects of the implementation of road widening project in the province of Sorsogon. It involved 240 respondents composed of Project Engineers and Project Inspectors from the DPWH Regional Office and DPWH Sorsogon First and Second District Engineering Offices, LGU officials composed of the Municipal Engineers, SB members on Infrastructure committees, Barangay Captains and members of the community where the project was implemented. A survey questionnaire was formulated and submitted to the dissertation committee for evaluation and approval.

Dry-run was conducted to 30 DPWH personnel outside Sorsogon province after which distribution of the survey-questionnaires to the respondents mentioned above was administered by the researcher. Considering the pandemic, sufficient time was given to the respondents to answer the questionnaires. Retrieval of the instruments was done. The data gathered from the respondents were subjected to statistical analysis where various descriptive statistics were considered. A weighted mean was used to assess the extent of effects of the implementation of road widening project as perceived by the respondents in terms of efficiency, effectiveness, equity, ethics, economy and environment. The Chi-square test of homogeneity was used to determine the significant difference among the perceptions of the respondents along the identified variables and ranking was utilized to identify the problems met in the implementation of the road widening project.

V. DATA ANALYSIS

Table 1: Extent of Effects of the Implementation of Road Widening Project in terms of Efficiency

Indicators	WM	Interpretation
1. Road repair maintenance does not affect the traffic flow.	3.35	Moderately Effective
2. Reduce traffic congestion inside and outside the town/city.	3.49	Moderately Effective
3. Minimize road cracks after the road widening.	3.35	Moderately Effective

4. The drainage that had been provisioned prevents the accumulation of the water along the national road.	3.42	Moderately Effective
5. Provide a proper compensation for resettlement of residents that had been affected by the road widening.	3.35	Moderately Effective
6. Traffic aide is provided during road repair in either sides of the lane.	3.42	Moderately Effective
7. Visible traffic signs for all motorists during road maintenance.	3.46	Moderately Effective
8. Systematic reporting to authority in case of road related accidents	3.43	Moderately Effective
9. Regular check of road status for repair and routine maintenance of national highway in the province.	3.42	Moderately Effective
10. Steel or concrete barriers were installed to prevent extended damages to houses that were near the national highway.	3.38	Moderately Effective
Overall Weighted Mean	3.41	Moderately Effective

Table 1 revealed the extent of implementation of road widening project in terms of efficiency. It can be gleaned that the overall WM was 3.41 which described as *moderately effective*. This meant that the implementation of road widening was efficient. It also

showed that among the indicators, reduced traffic congestion inside and outside the town/city got the highest WM of 3.49 described as *moderately effective*. This meant that the implementation of road widening had served its purpose.

Table 2: Extent of Effects of the Implementation of Road Widening Project in terms of Effectiveness

Indicators	WM	Interpretation
1. Tourist destinations are now accessible due to road widening.	3.49	Moderately Effective
2. In case of soil erosion along the national road, traffic flow is not hampered.	3.44	Moderately Effective
3. Road widening projects are able to handle the volume of vehicles on daily basis.	3.55	Effective
4. Road safety and signs are visible for users.	3.43	Moderately Effective
5. Reduce the number of accidents in year to year basis.	3.41	Moderately Effective
6. All roads are passable any time.	3.48	Moderately Effective
7. National roads that are considered accident prone areas were included in the widening projects.	3.48	Moderately Effective
8. Terrains slope near the national road has been stabilized to prevent soil erosion.	3.41	Moderately Effective
9. Culvert pipes are installed to prevent obstructions of water flow from both sides of the roads.	3.38	Moderately Effective
10. All establishments are now accessible.	3.42	Moderately Effective
Overall Weighted Mean	3.45	Moderately Effective

Table 2 presented the effects of the implementation of road widening project as perceived by the respondents in terms of effectiveness. The overall WM was 3.45 described as *moderately effective*. This meant that the implementation of road widening was *effective* and *moderately effective* in a way that road widening

projects are able to handle the volume of vehicles on a daily basis, that tourist destinations are now accessible and are passable any time and that national roads considered as accident prone areas were included in the widening project.

Table 3: Extent of Effects of the Implementation of Road Widening Project in terms of Equity

Indicators	WM	Interpretation
1. Reduce the travel time from one town to another.	3.49	Moderately Effective

2. The roughness of the road is suitable to minimize the wear and tear of any vehicle.	3.42	Moderately Effective
3. Help reduce fuel consumption to road users.	3.46	Moderately Effective
4. All motor vehicles are allowed to utilize the road regardless of its type.	3.44	Moderately Effective
5. Everyone can use the road regardless of race, time, etc.	3.47	Moderately Effective
6. Improved road safety all time due to constructions of pedestrian path.	3.44	Moderately Effective
7. Safe access for pedestrians and vehicles were provided.	3.45	Moderately Effective
8. There is provision lane for bicycle users.	3.29	Moderately Effective
9. Road expansions have a provision of elderly and persons with disabilities.	3.29	Moderately Effective
10. The road expansion enables also to accommodate a large volume of people for sidewalk users.	3.36	Moderately Effective
Overall Weighted Mean	3.41	Moderately Effective

Table 3 included the effects of the implementation of road widening project as perceived by the respondents in terms of equity.

From the table, the overall WM was 3.41 described as *moderately effective*. This showed that the majority of

respondents believed that the road widening is *moderately effective* and benefits the people in a way as reduce travel time from one town to another thereby reducing fuel consumption to road user and that everyone can use the road regardless of race, time and others.

Table 4: Extent of Effects of the Implementation of Road Widening Project in terms of Ethics

Indicators	WM	Interpretation
1. Speed limit were observed by any vehicles or road users	3.36	Moderately Effective
2. Allotted roadside parking for emergency had been observed	3.35	Moderately Effective
3. Road contractors handle the labor cost for the repair of damaged properties during the road widening projects.	3.35	Moderately Effective
4. Slow moving vehicles utilized the outer lane	3.33	Moderately Effective
5. Fast moving vehicles utilized the inner or middle lane of the road	3.38	Moderately Effective
6. Road signs were strictly followed by all road users to mitigate accidents	3.35	Moderately Effective
7. There is no any vehicles that pursue the counter flow of traffic direction	3.38	Moderately Effective
8. It preserves the areas that have the aesthetic value to the location	3.38	Moderately Effective
9. Constructions follows the national noise standard especially if the road works are nearby the school, hospitals and alike	3.4	Moderately Effective
10. Relocation of electrical poles as coordinated with the designated electric cooperatives	3.36	Moderately Effective
Overall Weighted Mean	3.36	Moderately Effective

Table 2-D presented the WM and interpretation of the extent of effects of the implementation of road widening project as perceived by the respondents in terms of ethics. The overall WM was 3.36 described as *moderately effective*. It showed that the respondents agree that the implementation maintain the ethics in

construction such as fast moving vehicles utilized the inner or middle lane of the road, there is no any vehicle that pursue the counter flow of traffic direction and preserves the areas that have the aesthetic value to the location.

Table 4: Extent of Effects of the Implementation of Road Widening Project in terms of Economic

Indicators	WM	Interpretation
1. Improved delivery of goods from locality and other products from other region.	3.47	Moderately Effective
2. New traffic stops had been established to purchase goods.	3.39	Moderately Effective
3. New job had been generated.	3.44	Moderately Effective
4. Maintenance of road widening does not decrease the GDP of the locality.	3.44	Moderately Effective
5. Farm products are delivered on time and of good quality.	3.48	Moderately Effective
6. Prime agricultural lands were not included in the road widening projects	3.38	Moderately Effective
7. There were no displaced SME or closed variety stores before and after the constructions of road expansion.	3.36	Moderately Effective
8. Increased financial transactions such as the presence of banks and alike.	3.38	Moderately Effective
9. New gasoline stations had been established for motorists' needs.	3.4	Moderately Effective
10. Presence of establishment that caters an emergency repair for vehicles.	3.36	Moderately Effective
Overall Weighted Mean	3.41	Moderately Effective

Table 4 included the WM as an interpretation of the extent of effects of the implementation of road widening project as perceived by the respondents in terms of economic. The overall WM was 3.41 described as *moderately effective*. This meant that the

implementation of road widening projects help the economy in many ways such as farm products are delivered on time and of good quality, there is an improved delivery of goods from locality and other products from other regions and new jobs are generated.

Table 5: Extent of Effects of the Implementation of Road Widening Project in terms of Environment

Indicators	WM	Interpretation
1. The air pollution does not worsen even after the road widening	3.47	Moderately Effective
2. It does not cause water pollution due to the gasoline or any chemical that fell off from passing vehicles.	3.39	Moderately Effective
3. Noise pollution does not worsen even after the road widening	3.44	Moderately Effective
4. Road diversions had been created to minimize the effect of air and noise pollution in the locality	3.44	Moderately Effective
5. Trees and animals were not harmed before and after the road widening	3.48	Moderately Effective
6. Generation of dust during the construction is being controlled to prevent health risk to nearby houses	3.38	Moderately Effective
7. Minimize flooding in the national road during heavy rains	3.36	Moderately Effective
8. Coastlines or areas that were considered as break waters were not included in the road widening	3.38	Moderately Effective
9. Road widening does not pose a thermal variation or increased in the thermal index in the nearby houses	3.4	Moderately Effective
10. No aquifers had been destroyed during the constructions of road expansion.	3.36	Moderately Effective
Overall Weighted Mean	3.41	Moderately Effective

Table 5 contained the WM and interpretation of the extent of effects of the implementation of road widening

projects as perceived by the respondents in terms of environment. The overall WM was 3.41 described as

moderately effective. It can be asserted that the respondents said that the road widening was moderately effective and did not harm the environment in different aspect such as trees and animals were nor harmed before

and after the road widening; as well as the noise pollution did not worsen even after the road widening and road diversion had been created to minimize the effects of air and noise pollution in the locality.

Table 6: Difference in the Perceptions of the Respondents along the Identified Variables

Statistical Bases	Statistical Analyses					
	Efficiency	Effectiveness	Equity	Ethics	Economic	Environment
Degree of Freedom	4	4	4	4	4	4
Level of Significance	5%	5%	5%	5%	5%	5%
Critical Value	9.49	9.49	9.49	9.49	9.49	9.49
Computed X2-test	1.32	1.08	2.46	1.42	0.84	1.61
Decision on Ho	DNR	DNR	DNR	DNR	DNR	DNR
Interpretation	NS	NS	NS	NS	NS	NS

Legend: NS-Not significant; DNR-Do Not Reject

Table 7: Problems Met in the Implementation of the Project

Problems	Sum of Ranks	Rank
Resettlement of households that were affected by the road expansion	317	1
Settlement of the right of way to registered residential lots	392	2
Peace and order during constructions is being affected by external group	419	3
Presence of prime agricultural lots that contribute to local economy	507	4
Presence of major industries or establishment along the road expansion	512	5
Spoils due to clearing of land for site preparation to be used for temporary construction camps	639	6
Contamination of the land from hazardous and toxic chemicals and construction materials spillage	672	7
Fugitive emissions from asphalt and concrete mixing plants	785	8
Removal of existing pavement and extraction of borrow materials Dust generated from haul roads, unpaved roads, exposed soils and stock piles materials	849	9
Dust generated from haulroads, unpaved roads, exposed soils and stock piles materials	917	10

Table 6 presented the problems met by the respondents wherein the resettlement of households that were affected by the road expansion ranked one. For the project to materialize, it was inevitable to relocate establishments and houses that are within the road right-of-way. It is among the few indicators that the management could do little about. In the same way, the settlement of the right-of-way to registered residential lots ranked second.

VI. INTERPRETATION OF RESULTS

Extent of Effects of the Implementation of Road Widening Project

Table 1 to 7 presented the extent of effects of the implementation of road widening project as perceived

by the respondents in terms of efficiency, effectiveness, equity, ethics, economic and environment. To analyze the data, weighted mean was utilized. Table 1 revealed an overall weighted mean of 3.41 which was described as *moderately effective*. This meant that the implementation of road widening was efficient and had a positive impact on the residents. The most basic definition of efficiency is the ratio of output and input. Hence, to have an efficient implementation of road widening implied that the benefits through the output should be maximized with minimal problems and output. If these are the objects for consideration for road development outputs, then having the public perceive that the implementation of

these road widening did minimal hassle and harm to them, it can be said that the project was efficient. These are clear implications that the project did its due diligence in minimizing the negative inputs or effects of the development project. Table 2 resulted to an overall weighted mean of 3.45 described as *moderately effective* meant that the implementation of road widening was *effective* and *moderately effective*. Effectiveness is the measure of how the project meets its goals and one of the most important roles of the road widening is the safety of the public using it. According to Rajashekara & Konthoujam (2015), there exists a relationship between the speed and flow of traffic. Specifically, the higher volume flow of vehicle in a certain road, the lower the speed of the traffic itself is. This is important because speed plays an important role in the overall safety of the traffic, not only to the drivers but also to the pedestrians but to the residents as well. Table 3 resulted to a weighted mean of 3.41 described as *moderately effective* and showed that the majority of respondents believed that road widening benefits the people by reduced travel time thereby reducing fuel consumption. That these benefit have a reach to all stakeholders that includes the public, the government and business entities. Table 2-D with an overall weighted mean of 3.36 described as *moderately effective* showed that the respondents agreed that the implementation of road widening maintain the ethics in construction. Indicators for ethics implicate the enforcement of principle. Safety protocols were established and legitimacy issues were recognized. Table 4' resulted to an overall weighted mean of 3.41 described as *moderately effective* and meant that the implementation of road widening project helped the economy in many ways such as farm products are delivered on time and of good quality and there is an improved delivery of goods from locality. Implications of better economy has indirect effects to the overall quality of life of all individuals in the form of cheaper prices of commodities, stronger tourism, job opportunities, easy transportation and accessible government services. Indeed, road development has paved the way to globalization and these are small steps towards industrialization and proliferation of technology. Lastly, in Table 5, the overall weighted means was 3.41 described as *moderately effective*. It can be gleaned from the table that the respondents said that road widening did not harm the environment in any aspect. Road widening was moderately effective in its environmental impacts implicating that the project was effective in its environmental impact mitigation and reduction strategies. The project was specifically preventive to such impact and even

excluded agricultural lands to be paved and trees to be cut in the development.

Difference in the Perceptions of the Respondents along the Identified Variables

Table 3 contains the statistical bases and statistical analyses of the difference in the perceptions of the respondents on the extent of effects of the implementation of the road widening project. The Chi-square test of homogeneity was used to determine significant difference. From the date, it showed that relative to efficiency and effectiveness, the χ^2 computed values are 1.32 and 1.08, respectively, which are less than the χ^2 critical value of 9.49 at 0.05 level of significant with degrees of freedom of 4. Hence, the null hypothesis was not rejected which meant that there was no significant difference among the perceptions of the respondents on the effects of the implementation of road widening project. This meant that they have similar observations on how the project made the usual activities become simple. It also implied that with the implementation of this project, this may be effective on the part of the commuters and travelers but with disadvantage to residents where activities are hampered due to the project. Likewise, the χ^2 computed values of 2.46 and 1.42 for equity and ethics, respectively, did not exceed the χ^2 critical value of 9.49 with degrees of freedom of 4 at 0.05 level of significance. Thus, the non-rejection of the hypothesis which was stated in null form states that there was no significant difference among the perceptions of the three groups of respondents on the effects of implementation of road widening projects. In the same manner, relative to economic and environment, the respondents have similar perceptions on the effects of the implementation of road widening project since the χ^2 computed values of .84 and 1.61, respectively, were less than the χ^2 critical value of 9.49 at 0.05 level of significance with degrees of freedom of 4. This means that the null hypothesis was not rejected which indicated that the perceptions of the respondents did not differ significantly.

Problems Met in the Implementation of the Project

Table 4 presented the sum of ranks and rank of the problems met by the respondents in the implementation of road widening project where in resettlement of households that were affected by the road expansion ranked one. For the project to materialize, it was inevitable to relocate establishments and houses that are within the road right-of-way. It is among the few indicators that the management could do little about. In the same way, the settlement of the right-of-way to registered

residential lots ranked second. This is a very tedious process since the settlement of right-of-way involved negotiations and processes for the legitimacy of the project which sometimes results to the delay in the project implementation. Ranked third was peace and order during construction is being affected by external group. This is a perennial problem due to the presence of armed groups on projects located at far-flung areas. This time however, this is being addressed by deploying police or military forces at the vicinity of the construction sites but such practice tends to add burden to the implementing agency and the contractor. Next in rank was the presence of prime agricultural lots which contribute to local economy. The economic value of real properties significantly increases when roads are constructed near the area. Nevertheless, lot owners must be appropriately compensated based on existing laws, rules and regulations. Another indicator which was considered significant was the presence of major industries or establishments along the road expansion. This factor has both positive and negative aspects. Negatively, the space between the road and the establishment was reduced, in effect, the risk of accidents and the exposure to pollution increases. Positively, however, the reduction of space would make the establishment more accessible and visible to the public that is to the advantage of the owners. The debris and spoils due to clearing of land for site preparation to be used for temporary construction camps ranked six. This is a clear indication that immediate clearing of the spoils that could obstruct traffic, pose hazards to motorists and pedestrians and add dust pollution to the sites are done immediately.

The contamination of the land from hazardous and toxic chemicals and construction materials spillage ranked seven, while fugitive emissions from asphalt and concrete mixing plants was ranked eight and the removal of existing pavement and extraction of borrow materials ranked nine and the dust generated from the haul roads, unpaved roads, exposed soils and stock piles materials got the last rank. These last four indicators all point to negative factors of the road widening in the form of pollution and hazard. But the fact that they were ranked at the bottom indicates that the stakeholders acknowledged the precautions put in place by the agency to minimize the environmental disturbance that goes with infrastructure project through careful and systematic planning.

Convergence Plan on Project Management of Road Widening Project in the province of Sorsogon

This Convergence Plan emerged based on the results of the study. It is a plan that involves inter-agencies

that are part of the agencies that will undertake activities in every implementation of road widening projects. To address the problems encountered by the stakeholders, a Convergence Plan was proposed to provide a mechanism to enhance future road widening projects in the province of Sorsogon.

VII. CONCLUSIONS

Based from the study, the following conclusions were drawn:

1. The effects of the implementation of road widening project as perceived by the respondents in terms of efficiency, effectiveness, equity, ethics, economic and environment are all interpreted as *moderately effective*.
2. The perceptions of the three groups of respondents do not differ significantly on the effects of the implementation of road widening project along the identified variables.
3. The problems met along the implementation of the road widening project to include: resettlement of households that were affected by the road expansion, settlement of the right-of-way to registered residential lots and peace and order during construction are being affected by the external group.
4. The convergence plan was designed in order to improve the implementation of the road widening project in the province of Sorsogon.

VIII. RECOMMENDATIONS

Based from the conclusions, the following recommendations were offered:

1. The DPWH to maintain a databank of proposed road widening project with resettlement, right-of-way and other issues for appropriate action before the implementation date of the project.
2. The DPWH may continuously coordinate with the affected LGUs, barangay officials and community regarding the road widening project in order to maintain the understanding and acceptance of the project.
3. The DPWH to provide support to stakeholders before and after the implementation of the road widening project to address misinformation and commotion.
4. The proposed intervention may be submitted for review and evaluation to concerned authorities prior to its implementation to solve the most critical dilemma encountered by the affected household caused by the road widening.
5. Further study may be conducted to cover the entire region so as more respondents will be involved in

the study. Also, other areas related to road management can be included in the study.

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