



PLANNING PROBLEMS IN THE IMPROVEMENT OF ACCESS TO EMERGENCY OBSTETRIC CARE IN EASTERN INDONESIA

Frederika Rambu Ngana^{1,2*}, AAIN Eka Karyawati³

¹The Northern Institute, Charles Darwin University, Ellengowan Drive, Darwin, Northern Territory 0909, Australia

²Faculty of Science and Technology, Nusa Cendana University, Kupang City, Nusa Tenggara Timur 85001, Indonesia

³Faculty of Mathematics and Natural Sciences, Udayana University, Badung, Bali 80361, Indonesia

*frederika.rambungana@cdu.edu.au

ABSTRACT

Maternal death is the worst performing of the Millennium Development Goals (MDGs) and Indonesia did not achieve its MDG #5 target in 2015. Therefore, the Indonesian government needs to review its strategies to decrease maternal deaths. One cause of maternal death is a lack of infrastructure, which can delay reaching emergency obstetric care (called *Poned*). This qualitative study investigated problems with priority planning in the Kupang district in order to improve access to emergency obstetric care (EMOC). A number of observations were conducted in the *musrenbang* (the district planning process). Interviews were carried out to gain an insight into the planning process from village to district level. A model for travel time to EMOC was created to support this study. In this study, six problems were identified in the district planning (*musrenbang*) regarding improving access to EMOCs. Those were (1) no planning proposal about improving access to EMOC, (2) budget constraints, (3) decision on the priority planning not being based on the level of urgency, (4) undue political influence, (5) lack of evidence and (6) incorrect measure of accessibility to obstetric care. Hence, to improve access to EMOC, scenario modelling with combined cost-benefit analyses (CBA) as an evidence-based planning should be applied in the *musrenbang*. It will help the health planners in Eastern Indonesia to gain a deep understanding about the problems in district planning process for access improvement to EMOC. Scenario modelling with CBA could provide the evidence during *musrenbang*.

Keywords: evidence-based planning; maternal death; scenario modelling

First Received

10 April 2021

Revised

23 May 2021

Accepted

28 May 2021

Final Proof Received

29 May 2021

Published

29 May 2021

How to cite (in APA style)

Rambu Ngana, F., & Karyawati, A. E. (2021). Planning Problems in the Improvement of Access to Emergency Obstetric Care in Eastern Indonesia. *Indonesian Journal of Global Health Research*, 3(2), 151-166. <https://doi.org/10.37287/ijghr.v3i2.447>

INTRODUCTION

According to the WHO (2020), every year almost 300.000 women die during pregnancy and childbirth. WHO established a Millennium Development Goal (MDG) to reduce the maternal mortality ratio (MMR), which is the number of maternal deaths per 100.000 live births. The goal was to reduce the 1995 MMR by 75% by 2015. All countries instituted plans to implement this MDG, but Indonesia could not achieve the MDG target. Indonesia faces the problem of high maternal mortality. To decrease maternal mortality, the Indonesian Ministry of Health set a national target to decrease MMR to 102 by 2015. The MMR in Indonesia in 2015 was still high – 305 (Kementrian Kesehatan Republik Indonesia, 2020).

In an attempt to decrease the MMR, in 2004 the Indonesian Ministry of Health implemented a national program, the Basic Emergency Obstetric Care program – or *Poned* (*Pelayanan*

Obstetri Neonatal Emergensi Dasar) – at district level (Kementerian Kesehatan RI, 2013). Since then, the MMR has decreased, but the number of maternal deaths is still high, especially in remote locations. Belton, Myers, and Ngana (2014) found that one cause of maternal deaths in eastern Indonesia resulted from the delaying women to reach emergency obstetric care locations. Because of geographical isolation, access to health services is difficult in the remote eastern areas of Indonesia (UNICEF, 2017). For example, the Timor Tengah Selatan district in eastern Indonesia has a mostly rugged landscape with many rivers and poor roads, making travel difficult and slow (Myers, Fisher, Nelson, & Belton, 2015). Most people in the Timor Tengah Selatan district are isolated from health services by valleys, hills and rivers; in emergencies, many villagers have difficulty accessing health services quickly (Myers et al., 2015). To tackle this problem, a maternal health program with a ‘clustering island’ approach was implemented in eastern Indonesia by UNICEF in 2010. The program reduced travel time to reach obstetric care from 48 hours to 8 hours (UNICEF, 2017). However, more maternal deaths can be prevented if emergency obstetric care (EMOC or *Poned*) can be reached within 2 hours (Myers et al., 2015). The Indonesian Ministry of Health has used travel time as the basis for determining the location of *Poned*: the *Poned* location should be reached in less than 1 hour by public transport. For a referral hospital, travel time should be less than 2 hours (Kementerian Kesehatan RI, 2013).

Indonesian national infrastructure planning should aim to improve access to health facilities by considering geographical conditions. Titaley, Hunter, Dibley, and Heywood (2010) suggested the accessibility and availability of health-care services should be improved, particularly for communities in rural areas. Provision of better maternal health services is essential to achieve Indonesia’s maternal health goals. For maternal emergencies, the time taken to reach EMOC is critical. Thus, the Indonesian Government needs to review their infrastructure planning to decrease maternal deaths by considering travel time to *Poned*. Few studies have investigated the problems in planning to improve access to EMOC. The purpose of this research is to investigate the problems associated with decision making about priority infrastructure planning to improve access to EMOC. In this study, we observed a *musrenbang* (district government planning process) in the Kupang district and interviewed the participants to understand how priority planning decisions were made, and how the participants measured the effectiveness of decision making for planning. We also created a travel time map to show problems in accessibility to EMOC.

METHOD

Study Area and Demographics

This case study was carried out in the eastern Indonesian province of Nusa Tenggara Timur (NTT). NTT is facing development problems because its rural population is geographically isolated from public services, which is related with poor transport infrastructure and the large number of islands. NTT province consists of a land area of 47,349 km² that is mainly mountainous and hilly, with few flatlands (BPS NTT, 2013). The province experiences a short but intense wet season every year, during which road access is often disrupted by flooding and landslides. The NTT province has 21 districts, 1 city, and four main islands: Timor, Sumba, Alor and Flores. The western part of Timor which is in eastern Indonesia has 1,188 smaller islands (PPID NTT, 2019).

The population of NTT province in 2019 was about 5.5 million and the average population density was 115 people per km² (BPS NTT, 2019), which is less than the national average for Indonesia. For 2014 to 2018, most of the NTT districts have an MMR of more than 103

maternal deaths per 100,000 live births (Figure 1), which exceeds the Indonesian MDG of an MMR of 102 by 2015 (Belton et al., 2014).

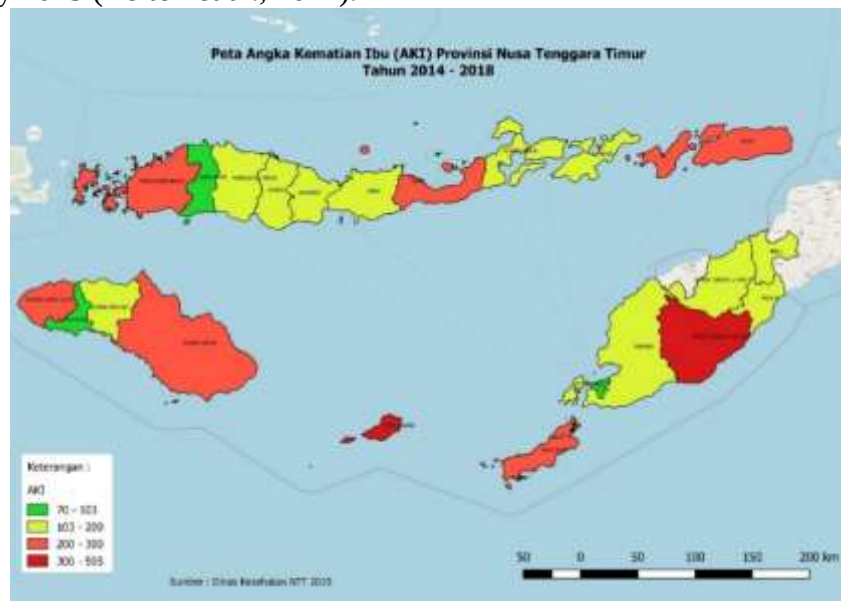


Figure 1. Maternal mortality ratio (MMR, deaths per 100,000 live births) averaged for 2014–2018 for the districts of Nusa Tenggara Timur province in eastern Indonesia (Dinas Kesehatan Provinsi NTT, 2019).

This case study was undertaken in the Kupang district in the eastern Indonesian province of NTT. The Kupang district comprises Timor Island and some islands close to Kupang city, the capital city of NTT. This district was chosen for the research because of its rugged geography and because the population is dispersed across Timor Island.

In 2018, 8,510 women gave birth in the Kupang district. Deliveries at health facilities were 5,562; deliveries not at health facilities were 644. The number of babies born (neonatal) was 8,105. The number of live births was 5,530 and the number of stillborn babies was 78. The number of pregnant women was 8,916, including 8 who died (Dinas kesehatan kabupaten Kupang, 2019). *Poned* in Kupang district are Puskesmas Oesao, Puskesmas Oekabiti, Puskesmas Takari, Puskesmas Uitao (on Semau Island) and Puskesmas Lelagama.

Qualitative Methods

We observed *musrenbang* (*Musyawarah Rencana Pembangunan*), an Indonesian Government planning process. The participants were interviewed to understand how priority planning decisions were made, and how the participants measured the effectiveness of decision making for planning (Figure 2).



Figure 2. Observation of *musrenbang* in a subdistrict.



Figure 3. Travelling to Amfoang subdistrict.

We observed *musrenbang* from village level to district level. The *musrenbang* activities occur every year from January to April. They are held from the sub-village level to the district level. We were invited by the head man of the district to take part in their planning process from village level to district level. The planning meetings were held in several subdistricts which are located long distances apart. Travelling to some of the meeting places took three days and was sometimes difficult and dangerous (Figure 3): large rivers had to be crossed, and forests and mountains negotiated. Local villagers provided accommodation for us along the way. Sometimes we travelled by boat to other islands. Moreover, the roads were in extremely poor condition. In addition, the planning meetings were held during the rainy season when flooding occurred, making attendance at several meetings impossible.

To understand the problems with accessibility and difficulty travelling to *Poned*, we went to poor communities in remote areas in the Kupang district. To visualise the access difficulties, we created a travel time model with a scenario for travel in the rainy season. The observations and interviews were audio and video recorded. The audio and video recording were transcribed for the analysis. The data were analysed using NVIVO software.

Ethical considerations

Ethics approval for the study was obtained from the university's Human Research Ethics Committee of Charles Darwin University (reference number H14016). There was no likelihood of harm or discomfort to participants in this research project. Written informed consent was obtained from participants.

RESULTS AND DISCUSSION

Development planning in the Kupang district occurs through *musrenbang*. *Musrenbang* was facilitated by the planning agency, *Bappeda* (*Badan Perencanaan Pembangunan Daerah*). This meeting process is based on a regulation UU No. 114 year 2014 from the Ministry of Internal Affairs (*Kementerian Dalam Negeri*) Republic of Indonesia. The process started in January at the sub-village level (*musrenbangdus*), in February at the village level (*musrenbangdes/kel*), in March at the sub-district level (*musrenbangcam*), in April at the SKPD forum and finished at the district level (*musrenbangkab*) at the end April. The SKPD forum is a coordination forum among development actors to discuss priority planning and

activities resulting from the subdistrict *musrenbang*. At each level of *musrenbang*, five areas of planning were discussed: government, education, economy, health, and infrastructure.

Not all participants from the bottom level attended the upper level of *musrenbang*. A maximum of five participants were sent as a delegation to the next level of *musrenbang*. Participants from each *musrenbangdus* sent their delegation to attend *musrenbangdes/kel*. Participants from each *musrenbangdes/kel* sent their delegation to attend *musrenbangcam*. Participants from each *musrenbangcam* sent their delegation to *musrenbangkab*. Before the *musrenbangkab*, there is a SKPD forum. However, at the SKPD forum, there were no delegation from *musrenbangcam* present at the meeting. At the SKPD forum, each of the five planning areas meets separately. We only attended the SKPD forum for infrastructure planning. The SKPD forum was held at the *Bappeda* office. The participants who attended the *musrenbang* from the village level to the district level are listed in Table 1.

Table 1.
List of participants in *musrenbang*

Musrenbangdes/kel ~40 people	Musrenbangcam ~100 people	SKPD Forum ~15 people	Musrenbangkab ~200 people
1. Delegations from the subdistrict officer	1. Dewan Perwakilan Rakyat Daerah (DPRD, regional House of Representatives)	1. Bappeda (district planning agency)	1. Governor's delegation
2. Pendamping desa (village assistants)	2. Satuan Kerja Perangkat Daerah (SKPD, regional work units)	2. Dinas Pekerjaan Umum (public work department)	2. Bupati - Kepala Daerah Tingkat Kabupaten (regent of Kupang district)
3. Babinkamtibmas (officer of the community police in the village)	3. Camat (headman of subdistrict) and subdistrict officers	3. Badan penanggulangan bencana daerah (BPBD, district disaster management agency)	3. SKPD
4. Badan Permusyawaratan Desa (BPD, the village consultative body)	4. Kapolsek (head of sector police)	4. Other participants which attended the meeting to oversee or to negotiate their planning proposal (such as DPRD).	4. DPRD
5. Delegations from Badan Usaha Milik Desa (BUMDes, village-owned enterprises)	5. Danramil (subdistrict military commander)	5. A Camat oversee the meeting by phone.	5. NGO
6. Rukun Warga (RW, neighbourhood representatives).	6. Delegations from villages		6. Subdistrict delegation
7. Lembaga Pemberdayaan Masyarakat Desa (LPMD, Village Community Empowerment Institution)	7. Religious leaders		
8. Religious leaders	8. Doctor and midwives from Puskesmas (community health centre)		
9. Youth leaders	9. Delegations from school		
10. Pemberdayaan dan Kesejahteraan Keluarga (PKK, Empowerment and Family Welfare)	10. Tokoh masyarakat (community leaders)		
11. Village Midwife	11. NGO (non-governmental organisations)		
12. Delegations from school			
13. Tokoh masyarakat Desa (village community leaders)			
14. The principal of the public school			

We did not list participants of the *musrenbangdus* because we observed only *musrenbang* from *musrenbangdes/kel* to *musrenbangkab*. *Musrenbangdus* was not formally held at sub village level.

The *musrenbang* process in the Kupang district was almost similar to the *musrenbang*'s guidelines written by Djohani (2008), Muluk (2008), Setyanto (2008), Suherman and Muluk (2008) and Suherman (2008). However, in this study, we found problems in the district planning regarding accessibility planning to EMOC. Those were (1) no planning proposal about improving access to EMOC, (2) budget constraints, (3) decision on the priority planning not being based on the level of urgency, (4) undue political influence, (5) lack of evidence and (6) incorrect measure of accessibility to obstetric care.

(1) No planning proposal about improving access to EMOC

The first problem is the absence of a planning proposal to improve access to EMOC in the district development planning. This means improving access to EMOC is not urgent for the district government. Whereas, increasing access to EMOC in the Kupang district relates to saving women's lives. Women died in eastern Indonesia because of long travel time to EMOC. Travel time to EMOC should be reached less than one hour by public transport (Kementerian Kesehatan RI, 2013). However, most areas in the Kupang district are more than 2 hours travel to EMOCs (Figure 4).

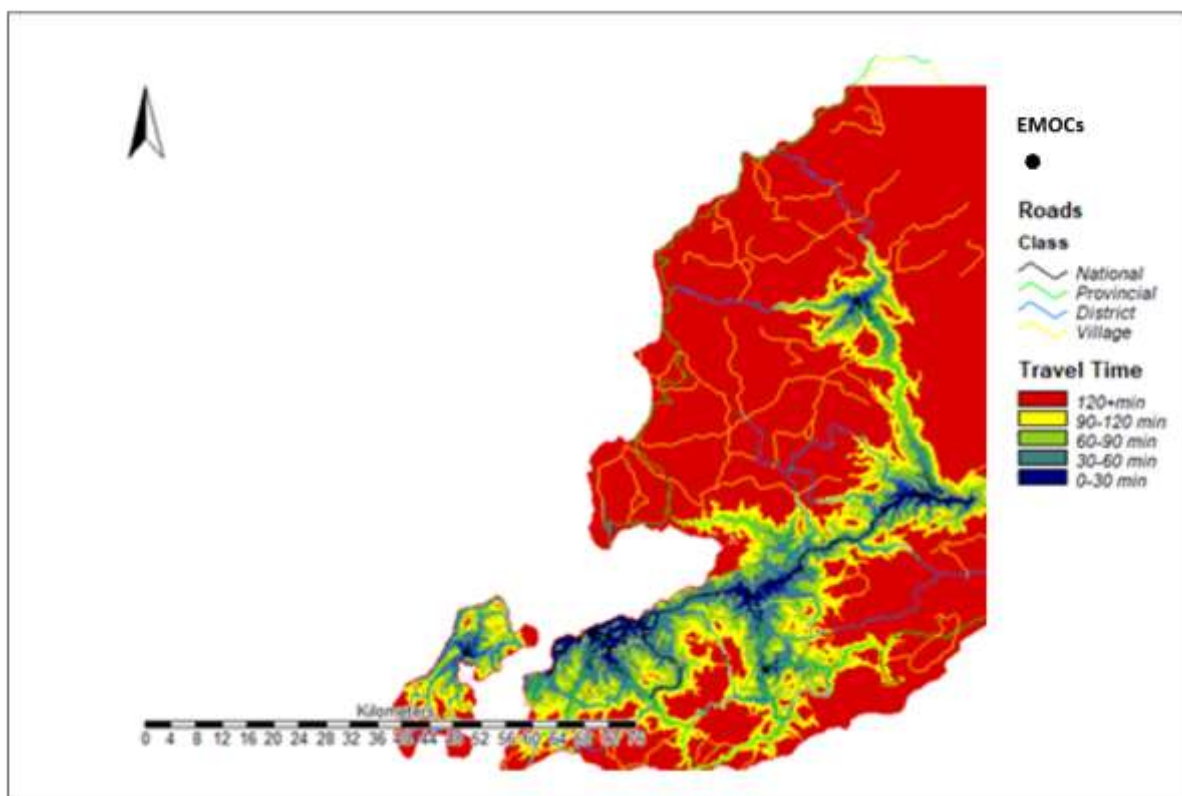


Figure 4. Map showing travel times to EMOCs (*Poneds*) in the rainy season in Kupang district. The red areas denote travel times of more than 2 hours.

Therefore, travel time is very important in terms of maternal health. Long travel time can cause a delay in reaching emergency obstetric care (Belton et al., 2014). Reducing travel time to EMOC should be priority planning in the district. Therefore, increasing access to EMOC is very urgent for the Kupang district.

(2) Budget constraints

Kupang district has a limited budget for planning, which cannot accommodate all planning proposals. Only five planning priorities in each planning area are chosen. In the observed *musrenbang*, participants at each level of *musrenbang* selected their five planning priorities for each planning area, which were sent to the next level above for consideration. This level then selected its five priorities. For example, the five priorities from the *musrenbangdus* (sub-village level) were sent to the *musrenbangdes/kel* (*musrenbang* at village level), and so on up the levels to the subdistrict level, and then to the SKPD forum. In this forum, the five planning priorities from each subdistrict were discussed to determine which could be accommodated in the RKPD (*Rencana Kerja Pembangunan Daerah*). The RKPD is a regional development work plan for the coming year. The chosen planning proposals at the SKPD forum were brought to the *musrenbangkab*. In this meeting, the final RKPD was made. At the end of *musrenbang*, only a few planning proposals from the bottom levels were accommodated in the planning budget. Thus, this process narrows down the number of planning proposals as they progress up the *musrenbang* levels (Figure 5).

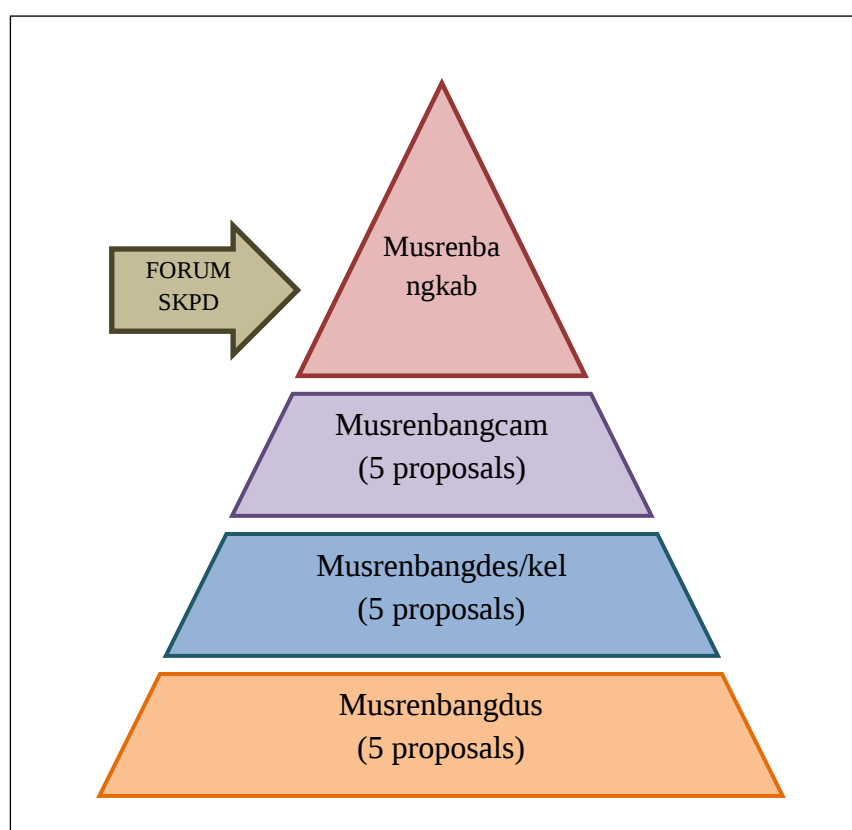


Figure 5. Planning proposals at each stage of *musrenbang*. Forum SKPD = *Satuan Kerja Perangkat Daerah*,

Budget limitations are the main issue in reducing maternal mortality in Kupang district (Saputra, Fanggidae, & Mafthuchan, 2013). Problems with limited budgets in government planning occur not only in Indonesia but also occurs in other developing countries (Ariteja, 2017). It is important to the district planners to be able to determine planning priorities based on urgency. Priority planning should be very urgent planning, which concerns saving a life (Setyanto, 2008) and benefits for many people (Djohani, 2008). Therefore, reducing maternal mortality should be a priority planning in the *musrenbang*.

(3) Decision on the priority planning not being based on the level of urgency, The priorities planning is determined with a scoring method; the planning proposals are scored from 1 to 5, with 1 the highest priority (Figure 6). Scoring and ranking method are used to determine the priority planning. Scoring : 1 to 5 based on the criteria of the priority planning, which number 5 is the highest score. Then the total scores are ranked. Ranking : 1 to 5, which 1 is for planning with the highest score as the highest priority.

No.	Kategori	Isi	Skor					Total Skor	Ranking
			Skor 1	Skor 2	Skor 3	Skor 4	Skor 5		
1	KEPERAWATAN	KEPERAWATAN							
2	KEPERAWATAN	KEPERAWATAN							
3	KEPERAWATAN	KEPERAWATAN							
4	KEPERAWATAN	KEPERAWATAN							
5	KEPERAWATAN	KEPERAWATAN							
6	KEPERAWATAN	KEPERAWATAN							
7	KEPERAWATAN	KEPERAWATAN							
8	KEPERAWATAN	KEPERAWATAN							
9	KEPERAWATAN	KEPERAWATAN							
10	KEPERAWATAN	KEPERAWATAN							
11	KEPERAWATAN	KEPERAWATAN							
12	KEPERAWATAN	KEPERAWATAN							
13	KEPERAWATAN	KEPERAWATAN							
14	KEPERAWATAN	KEPERAWATAN							
15	KEPERAWATAN	KEPERAWATAN							
16	KEPERAWATAN	KEPERAWATAN							
17	KEPERAWATAN	KEPERAWATAN							
18	KEPERAWATAN	KEPERAWATAN							
19	KEPERAWATAN	KEPERAWATAN							
20	KEPERAWATAN	KEPERAWATAN							

Figure 6. Scoring for priority planning.

The scoring is determined through *musyawarah* (deliberations). *Musyawarah* is an Indonesian cultural practice that respects the majority decision of participants. Hence, the highest-scoring option is based on the choice of the majority of the participants, and the participants make a united decision (*mufakat*).

However, the scoring of proposals is subjective, as noted by a Bappeda Officer: the community like to use scoring method for making decision of priority planning. It is easy for them. No need to think too much. But they do not know why a planning got score one (1) and other got score two (2). Sometimes, the planning score 1-1. So, there is no guideline on how to decide rank 1, 2, 3, 4, 5 for the priority planning.

The deliberation was used to decide the scoring of the proposed plans (1 to 5). The scoring was based on the majority votes of the participants not based on the assessment for the level of urgency. According to Djohani (2008), to determine priority planning in the *musrenbang*, the participants should use both scoring and ranking methods to assess planning proposals. The planning proposal with the highest score is then ranked number one as priority. An urgent

proposal must receive the highest score. For example, planning to solve a problem that can cause death is urgent and must be immediately resolved (Djohani, 2008). Therefore, planning to improve access to EMOC should be the first of the district planning.

(4) Undue political influence

In the Kupang district, planning proposals from lower levels must be maintained at the higher levels. However, undue political influence affects priority planning decisions, which results in priority proposals from the previous level of *musrenbang* no longer appearing on the list of priority plans at the next level. Dropping proposals from the lower levels usually happens at the upper levels of *musrenbang*. For example, a regional parliamentary member from the Kupang Timur subdistrict changed the priorities to his own preferred proposals, despite their not appearing on the priority lists of *musrenbangcam* in the subdistrict. For instance:

As member of Commission C (budgeting section at parliament), we are in a dilemma to help the subdistricts in Amfoang to provide funds for their planning. Meanwhile, we must keep trust of our community in Kupang Timur subdistrict. Actually, there were several road plans in Kupang Timur subdistrict which were not included in the priority planning list, but we fought to win it. (Parliamentary Member I). Our budgeting system is political. Therefore, sometimes in commission meeting, there are debate between SKPD leaders and DPRD. (Parliament Member II). Even though, the regional secretary of Kupang district asked the SKPD leaders to choose the most urgent planning priority.

All SKPD leaders must choose the very urgent planning to be priority for our APBD [regional revenue and expenditure budget] for next year. (District Secretary [SEKDA]). But the undue political influence at district level also affected the process. The political influence in *musrenbang* caused inequitable planning funding, with few regions receiving development funding from the district government. For example, the Kupang Timur subdistrict received the most funding for infrastructure planning, while planning proposals from the Amfoang subdistrict received little funding from the RKPD.

There are not equitable planning results between Amfoang and Kupang Timur subdistrict. Only few infrastructure planning from Amfoang get funding. Meanwhile, there are a lot of roads and bridges broken in Amfoang. It is difficult to travel in Amfoang. I am sad because only few parliament members from Amfoang and also SKPD attended the *musrenbangcam* in Amfoang. Not like in Kupang Timur, which the parliament members have commitment to help this subdistrict. (Bappeda).

Our findings are consistent with a report by the Australia Indonesia Partnership for Decentralisation (2014), which found that planning in Indonesia is influenced by the political process. As a result, there were not equitable planning results in the Kupang district. Some areas in the Kupang district still have long travel time to EMOC. For example, the condition of infrastructure in Amfoang is poor and needs funding for upgrading. In the rainy season, some areas in Amfoang are difficult to reach (Dinkes Kabupaten Kupang, 2016). This study shows that the decision made for prioritized planning at the district level was influenced by politic.

(5) Lack of evidence

We found that the representatives of the *musrenbang* from the lower levels could not defend the proposals which they submitted at the higher level because they often lacked evidence of

the importance of their planning proposal for the community. As a result, many planning proposals from *musrenbangdes/kel* were not accepted at *musrenbangcam*. Likewise, many proposals from *musrenbangcam* were not accepted at *musrenbangkab*. According to Badan Pemeriksa Keuangan Indonesia (2016), regional planning in Indonesia is ineffective due to many proposals from lower levels not appearing in the RKPD. For example, for the whole of Indonesia from 2014 to 2016, only 50% of planning proposals in the *musrenbang* appeared in the RKPD. This inline with Kompas Online (2008) cited by (Jackson, Purnawati, & Shaxson, 2018) which mentioned also that the *musrenbang* process is ineffective.

(6) Incorrect measure of accessibility to obstetric care.

Even though, no proposed planning regarding improving access to EMOC. However, there was one planning proposal to build new *poskesdes* (village health posts) to enable pregnant women to reach the *poskesdes* quickly. The existing *poskesdes* was difficult to be reached by those women. The women had to travel a long distance to the *poskesdes*. Therefore, the planning participants wanted to decrease the distance of the women to reach the *poskesdes* by proposing a plan to build a new *poskesdes*. We found that the *musrenbang* participants did not understand how decisions to improve clinic access for pregnant women should be made.

Participants noted:

I hope the location of new Poskesdes do not go too far, because many clinics did not meet the SPM [Minimum Service Standard] for health which the location of health facility must be less 3 kilometres so that people can reach it easily. Currently, the SPM is less than 40% because many pregnant women reached the clinic more than 5 to 10 km. That is pity for the pregnant women which used to come to clinic with their children. (*Bappeda* Officer)

The location of this new *poskesdes* is on the old village; the location is chosen to avoid pregnant women and children from dying because it was very far from them to come here [a clinic in a main city], so it really needs to build there. (District Health Officer)

These officers stated that *musrenbang* participants wanted to build new *poskesdes* that can be reached by pregnant women. However, their assumptions about accessibility were based on distance travelled in kilometres not based on travel time in hours. The distance (in metres) was used to measure accessibility problems to reach obstetric care in the district. Whereas, the travel time (in minutes) should be used for analysing access to obstetric care, not by using the distance (in metres). The distance should not be used as a measure of accessibility to obstetric care. It is not following the regulations of the Indonesian Ministry of Health (Kementerian Kesehatan RI, 2013) where travel time is used regarding accessibility to obstetric care. For example, travel time is important to be taken into account if intrapartum complications happen. The WHO intrapartum care model recommends that travel time to appropriate referral needs to be considered in development health care facilities where the caesarean section is not available (WHO, 2018).

The method of measuring accessibility to obstetric care by the district government is incorrect. Therefore, an incorrect measure of accessibility to obstetric care may mean that the Kupang district government does not recognise the problems or the urgency to address them. For example, the current locations of all EMOC in the district are in the capitals of each sub-district. If accessibility to EMOC is measured by using distance (in metres), the location of EMOC is closer to the women. However, if accessibility to EMOC is measured by using travel time (in minutes), then the location of EMOC is further away from the women.

Travel time is a more suitable measurement of accessibility for difficult geographic and terrain conditions. Some areas in the district have difficult geographic conditions (large rivers, hills, mountains and poor infrastructure) which are blocked in the rainy season. Some roads are cut off by flooding and landslides. This situation causes many women in Kupang district to be remote from obstetric care. These women often have to find alternative ways to access EMOC, such as crossing an ocean by boat or crossing rivers, walking through the savanna and forests, riding a horse, travelling by car or motor cycle, and sometimes a combination of those. The difficulties of the women to reach the EMOC cannot be seen by the district government.

Scenario modelling with combined cost and benefit analysis

We suggest that the decisions for priority planning in the Kupang district *musrenbang* should be evidence based. Evidence can demonstrate the urgency of a planning proposal and if it will benefit most community members. In Indonesia, evidence-based planning has been used in *musrenbang* in Aceh (Bappeda Kota Subulussalam, 2020). The Aceh Government mandated that all proposed planning must be evidence based to benefit the community and use government funds wisely.

Gap between evidence and political decision-making can be bridged using scenarios approach. Regarding planning to improve access to emergency obstetric care, we suggest using scenario modelling with a cost-benefit analysis (CBA) as evidence on which *musrenbang* participants can make the best decisions for priority planning. Scenario modelling with CBA can be used to compare the results of various scenarios. The *musrenbang* participants can then select the best strategy or prioritise their planning with minimum costs but maximum benefit for their communities. In America, CBA has been used since the 1940s for planning within limited budgets by the Bureau of Reclamation and the US Army Corps of Engineers to convince Congress of the need for public dollars to build dams (Vesilind & Morgan, 2004). The Bureau and the Corps put their arguments to the Congress by comparing resulting benefits and the costs of the projects; the project with the highest CBA was built first. CBA could be used to choose the best option for planning proposals at *musrenbang*. For example, a CBA of infrastructure planning with various scenarios for new clinics could be based on building costs and the benefits of a new clinic for decreasing travel time to EMOC for the most people.

Problems planning to improve access to EMOC might be solved using scenario modelling. The scenario modelling consists of cost and benefit analysis (CBA). The CBA can be used to analyse the benefit of the location of EMOCs based on the PONEB (EMOC)'s guidelines from the Ministry of Health Republic of Indonesia (Kementerian Kesehatan RI, 2013) which compares the cost of proposed planning. For example, the cost is the budget for infrastructure planning (such as planning to build EMOC, to fix bridges or to construct roads) and the benefit is the number of people who travel to emergency obstetric care for less than 1 hour as an impact of that infrastructure planning. This case study suggests a scenario modelling framework for improving access to emergency obstetric care in district planning. The framework can be drawn below (Figure 7).

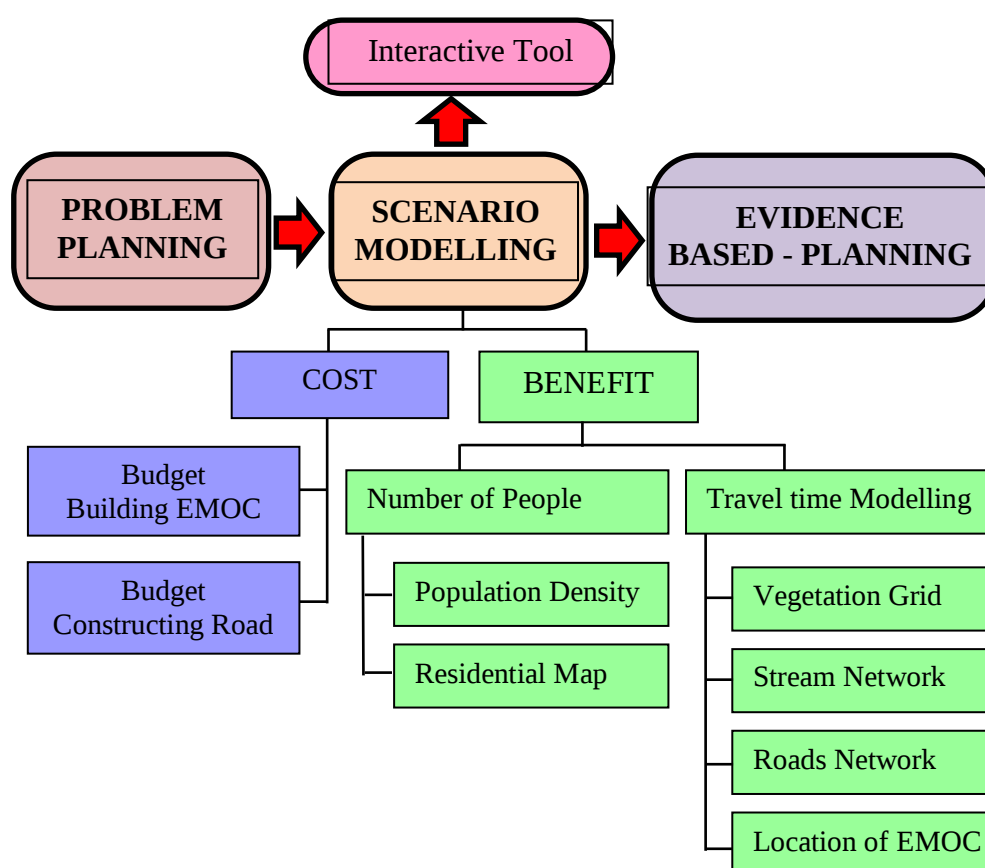


Figure 7. Scenario modelling framework for evidence-based planning to improve access to emergency obstetric care.

The CBA can be created using travel time modelling. Travel time modelling to support evidence-based planning for health services at the district level has been suggested by Fisher and Lassa (2017) in Indonesia and Huerta Munoz and Kallestal (2012) in Rwanda. The travel time model for the location of emergency obstetric care can be created by considering geographical accessibility features (vegetation, stream network, roads network and location of health services) which influence travel time in different seasons (Myers et al., 2015). After the travel time model is created, the number of people can be aggregated into the travel time model. The number of people can be counted by using population density and a residential map. Both the travel time model and the number of people can be results from scenario planning to improve access to EMOC. Therefore, the scenario modelling with CBA can be used to support evidence-based planning in the Kupang district planning.

Further work

This study has limitations. The research was done only during *musrenbang* at the village to the district level. We did not attend other government meetings to check whether the evidence was used there for making planning decisions to improve access to EMOC. We have developed an interactive scenario modelling tool for improving access to EMOC. We presented the interactive scenario modelling tool in another paper. Maternal health in Kupang district is not a priority planning by the district parliament (DPRD) (Saputra et al., 2013). Therefore, the district planners should emphasise to the planning participants the importance of improving access to EMOC. It can be started at the *musrenbangdes/kel* at the village level. Before the *musrenbang* begins, the district health planners and bappeda should introduce the

scenario modelling tool to all *musrenbang* participants in different villages. The participants will then understand the urgency of improving access to EMOC. After all participants accept the tool, then the village midwife can submit a proposed plan to increase access to EMOC to the sub-village development planning meeting (*musrenbangdus*). After the midwives' proposed plan has been listed in the *musrenbangdus* planning, the proposed planning can then be sent to the *musrenbangdes/kel*. In the *musrenbangdes/kel*, the village midwife can refine the planning proposal to increase access to EMOC by using the CBA scenario modelling tool. The tool could be used as evidence to strengthen the proposal to increase access to EMOC. The evidence from the midwife can also be supported by asking testimonials from the families of pregnant women who faced problems accessing the EMOC. The midwife should be selected to become a part of the sub-district *musrenbangkec* delegation to oversee the proposed plan to improve access to EMOC. After the proposed planning is included in the district planning priorities, then the health planners and *bappeda* could oversee the planning proposal at the SKPD forum and *musrenbangkab*.

CONCLUSION

Long travel time to the emergency of obstetric care (EMOC) is one cause of maternal deaths in eastern Indonesia. Therefore, the district government in eastern Indonesia need to have effective planning to improve access to EMOC. There are six problems planning to improve access to emergency obstetric care. Those were (1) no planning proposal about improving access to EMOC, (2) budget constraints, (3) decision on the priority planning not being based on the level of urgency, (4) undue political influence, (5) lack of evidence and (6) incorrect measure of accessibility to obstetric care. To solve those problems, we suggest the district planning (*musrenbang*) to use scenario modelling combined with cost and benefit analysis (CBA). Scenario modelling with CBA could provide the evidence during *musrenbang*.

ABBREVIATIONS

musrenbangdus: musyawarah rencana pembangunan dusun; *musrenbangdes/kel* : musyawarah rencana pembangunan desa/kelurahan ; *musrenbangcam* : musyawarah rencana pembangunan kecamatan; *musrenbangkab* : musyawarah rencana pembangunan kabupaten; *SKPD* : Satuan Kerja Perangkat Daerah; *poskesdes* : pos kesehatan desa; *Bappeda* : badan perencanaan pembangunan daerah; *SEKDA*: sekretaris daerah; *RKPD*: Rencana kerja pembangunan daerah.

ACKNOWLEDGEMENTS

We thank the Bupati of Kupang district in Nusa Tenggara Timur province, Indonesia, for permission to conduct this research in *musrenbang*. This research was supported by Charles Darwin University and the Directorate of Higher Education of the Republic of Indonesia.

REFERENCES

- Arteja, S. (2017). Demographic Bonus for Indonesia: Challenges and Policy Implications of Promoting Universal Health Coverage. *Jurnal Perencanaan Pembangunan: The Indonesian Journal of Development Planning*, 1(3), 265-274.
- Australia Indonesia Partnership for Decentralisation. (2014). Delivery Strategy 2010-2015. Retrieved from <http://aid.dfat.gov.au/countries/eastasia/indonesia/documents/AIPD-delivery-strategy.pdf>
- Badan Pemeriksa Keuangan Indonesia. (2016). *IHPS II Tahun 2016*. Retrieved from <https://www.bpk.go.id/ihps>

- Bappeda Kota Subulussalam. (2020). Usulan program 2020 wajib berbasis bukti. Retrieved from <http://bappeda.subulussalamkota.go.id/info/115/kategori-3-musrenbang.html>
- Belton, S., Myers, B., & Ngana, F. R. (2014). Maternal deaths in eastern Indonesia: 20 years and still walking: an ethnographic study. *BMC Pregnancy Childbirth*, 14(1), 39-39. doi:10.1186/1471-2393-14-39
- BPS NTT. (2013). *Data Statistik Provinsi Nusa Tenggara Timur*. Retrieved from <https://ntt.bps.go.id/>
- BPS NTT. (2019). *Statistik Sosial dan Kependudukan Provinsi Nusa Tenggara Timur 2019*. Badan Pusat Statistik Nusa Tenggara Timur Retrieved from <https://ntt.bps.go.id/>
- Dinas kesehatan kabupaten Kupang. (2019). *Laporan KIA 2018*. Dinas Kesehatan Kabupaten Kupang: Dinas Kesehatan Kabupaten Kupang
- Dinas Kesehatan Provinsi NTT. (2019). *Laporan KIA 2018*.
- Dinkes Kabupaten Kupang. (2016). *Profil Kesehatan Kabupaten Kupang tahun 2015*. Dinas kesehatan kabupaten Kupang Retrieved from https://www.kemkes.go.id/resources/download/profil/PROFIL_KAB_KOTA_2015/53_03_NTT_Kab_Kupang_2015.pdf
- Djohani, R. (2008). *Panduan Penyelenggaraan Musyawarah Perencanaan dan Pembangunan Desa*. http://kawasan.bappenas.go.id/images/data/Produk/PanduanMusrenbang/Musrenbang_Desa.pdf: Perpustakaan Nasional : Katalog Dalam Terbitan (KDT).
- Fisher, R., & Lassa, J. (2017). Interactive, open source, travel time scenario modelling: tools to facilitate participation in health service access analysis. *International Journal of Health Geographics*, 16. doi:10.1186/s12942-017-0086-8
- Huerta Munoz, U., & Kallestal, C. (2012). Geographical accessibility and spatial coverage modeling of the primary health care network in the Western Province of Rwanda.(Research). *International Journal of Health Geographics*, 11, 40.
- Jackson, E., Purnawati, E. B., & Shaxson, L. (2018). How and when do policymakers use evidence? Taking politics into account. In *Knowledge, politics and policymaking in Indonesia* (pp. 67-88): Springer.
- Kementerian Kesehatan RI. (2013). *Pedoman penyelenggaraan Puskesmas mampu PONED*. Retrieved from <http://cdn.stikesmucis.ac.id/PEDOMAN%20%20PENYELENGGARAAN%20%20PUSKESMAS%20MAMPU%20PONED.pdf>
- Kementrian Kesehatan Republik Indonesia. (2020). *Profil kesehatan Indonesia 2019*. <https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-indonesia-2019.pdf>: Katalog Dalam Terbitan. Kementerian Kesehatan RI
- Muluk, S. (2008). *Panduan Penyelenggaraan Musyawarah Perencanaan Pembangunan Kelurahan*. http://kawasan.bappenas.go.id/images/data/Produk/PanduanMusrenbang/Musrenbang_Kelurahan.pdf: Perpustakaan Nasional : " Katalog Dalam Terbitan (KDT).

- Myers, B., A., Fisher, R., P., Nelson, N., & Belton, S. (2015). Defining Remoteness from Health Care: Integrated Research on Accessing Emergency Maternal Care in Indonesia. *AIMS Public Health*, 2(3), 256-273. doi:10.3934/publichealth.2015.3.256
- PPID NTT. (2019). Tentang Provinsi NTT. Retrieved from <https://ppid.nttprov.go.id/tentang-provinsi-ntt/>
- Saputra, W., Fanggidae, V., & Mafthuchan, A. J. K. J. K. M. N. (2013). Efektivitas kebijakan daerah dalam penurunan angka kematian ibu dan bayi. 7(12), 531-537.
- Setyanto, W. P. (2008). *Panduan penyelenggaraan musyawarah perencanaan pembangunan kecamatan*.
http://kawasan.bappenas.go.id/images/data/Produk/PanduanMusrenbang/Musrenbang_Kecamatan.pdf: Perpustakaan Nasional : Katalog dalam terbitan.
- Suherman, N. (2008). *Panduan penyelenggaraan forum SKPD*: Perpustakaan Nasional : " Katalog Dalam Terbitan (KDT).
- Suherman, N., & Muluk, S. (2008). *Panduan penyelenggaraan musyawarah perencanaan pembangunan kabupaten/kota*: Perpustakaan Nasional : " Katalog Dalam Terbitan (KDT).
- Titaley, C. R., Hunter, C. L., Dibley, M. J., & Heywood, P. (2010). Why do some women still prefer traditional birth attendants and home delivery?: a qualitative study on delivery care services in West Java Province, Indonesia. *BMC Pregnancy Childbirth*, 10(1), 43-43. doi:10.1186/1471-2393-10-43
- UNICEF. (2017). *Improving Maternal and New Born Health Services in Eastern Indonesia. Finding from External Review*. Retrieved from <https://www.unicef.org/indonesia/documents/improving-maternal-and-newborn-health-services-eastern-indonesia>
- Vesilind, P. A., & Morgan, S. M. (2004). *Introduction to enviromental engineering* (Vol. 2): Thomson Brooks Cole.
- WHO. (2018). *WHO recommendations Intrapartum care for a positive childbirth experience*: World Health Organization.
- WHO. (2020). *Maternal Mortality*. Retrieved from https://www.who.int/gho/maternal_health/mortality/maternal_mortality_text/en/

