



Study on living environment and quality of life of coastal community in Gorontalo City, Indonesia

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Abstract. Coastal communities in particular fishermen are dealing with uncertainties due to the open access characteristic of coastal regime. In addition, the decrease in some parameters of coastal ecosystem affects quality of life of coastal community. This behavioral study aims to examine the quality of life of coastal communities as shown in the happiness index, which is measured through the satisfaction of their life domains. The first-hand data from a purposive sampling survey was carried out within twelve coastal administrative villages in three sub-districts in Gorontalo city, Indonesia. The survey used structured questioner with Likert scale. Fisher's Exact Test used to see the extent of the different perception of the respondent's status as an employee and non-employee in providing answers whether they are happy or unhappy. Respondents were selected using purposive sampling design with household as the unit analysis. The result shows that the level of happiness of the coastal communities of the city of Gorontalo is at a moderate level, with Index of Happiness of 83.4 on a scale of 0–100. Total score of eleven elements of life satisfaction is 81.60, shows that the community of Gorontalo living in the coastal administrative villages is satisfied with their behavioral life. The community enjoys family harmony as reflected in the highest of 82.37 and less satisfy with education aspect as the lowest score of 60.38. The moderate level of coastal community happiness of Gorontalo City implies the need for efforts to improve sustainability approach in regional development, especially in education and living environment aspect. Strategic policies should also be taken with the Gorontalo Provincial Government to reduce the impact of upstream development to the coastal area of Gorontalo City.

Key Words: decentralization, coastal management, happiness, empowerment, coastal ecosystem.

Introduction. A fast-growing population has encouraged land occupation and resource exploitation within coastal areas. United Nations estimates that around 44% of world population living in these areas. Countries with a high population living in coastal areas include the United States, 39% of the 123 million US population (Portman et al 2015), and Indonesia, 60% of the 250 million total population (Siry 2007). Since coastal is a natural system boundary it is vulnerable to environmental stresses which is either caused by human activities or external factors. To some extent, the condition will affect human life.

Gorontalo City, a small coastal city in the northern part of Sulawesi Island also experiences an escalation in natural resource exploitation. There are 7,914 inhabitants living in coastal area that extends 15 km along the Gorontalo Bay coastline (Tomini Bay) in the south of Gorontalo City. They inhabit the left and right sides of the Bone River estuary to the coastal area. Various development activities in the coastal area had result in the decline of various physical parameters. Sedimentation causes the adjacent waters to become cloudy and encourage the formation of deltas in the middle of the river estuary. In 2015, the Environment and Research Board of Gorontalo Provincial Government released report that the adjacent water is moderately contaminated. This, in long term can influence socio-economic conditions as well as the quality of life of coastal communities.

Quality of life was one of popular topics in western societies in 1970s and referred to overall sense of well-being as well as life satisfaction (Ng et al 2018). There is no, however, difference between the notions of quality of life, well-being, life satisfaction and happiness (Marans 2012).

Given that living environment including the condition of the coastal ecosystem is believed to be one of the most important factors affecting quality of life of coastal communities, there are very limited efforts examining relations between living environments and quality of life in Gorontalo coastal area.

This behavioral study is to fill the knowledge gap and sought to examine the first-hand data from a purposive sampling survey and to do situational analysis on physical biology data form literatures. Specifically, this paper seeks to examine the quality of life of coastal communities reflected in the happiness index by measuring the satisfaction of their life domains.

Material and Method. The present behavioral study used two types of data, namely primary and secondary data. The primary data was collected directly in the field through field survey and interviews with stakeholders by using a structured questioner. The survey took place within twenty-two administrative coastal villages of Gorontalo city in three sub-districts namely sub-district of Kota Timur, Hulonthalangi, and Dumbo Raya (see Figure 1). Respondents were selected by using purposive sampling design. The unit analysis is household. Household-related information is represented by a respondent who has status as the head of household or his partner. The number of respondents were 100 people scattered over the villages consists of self-employed (22%), fishermen and civil servants respectively (11%), manual workers (7%) and fishermen (6%). Approximately 86% respondents are head of the households, while the rest are housewives (14%). Based on the level of education, most respondents have completed: high school (35%); while the rest is composed of junior high school (23%), bachelor degree (20%), and elementary level (2%). Only 1% of the respondents have master's degree. There are 11 domains of life measured encompassing issues on health, education, job, income, environment, security, family life, social life, leisure, housing and asset, as well as affection of life satisfaction.

Secondary data regarding bio-physic and social economy was collected through literature review by studying data from the results of researches and studies of various agencies and research institutions.

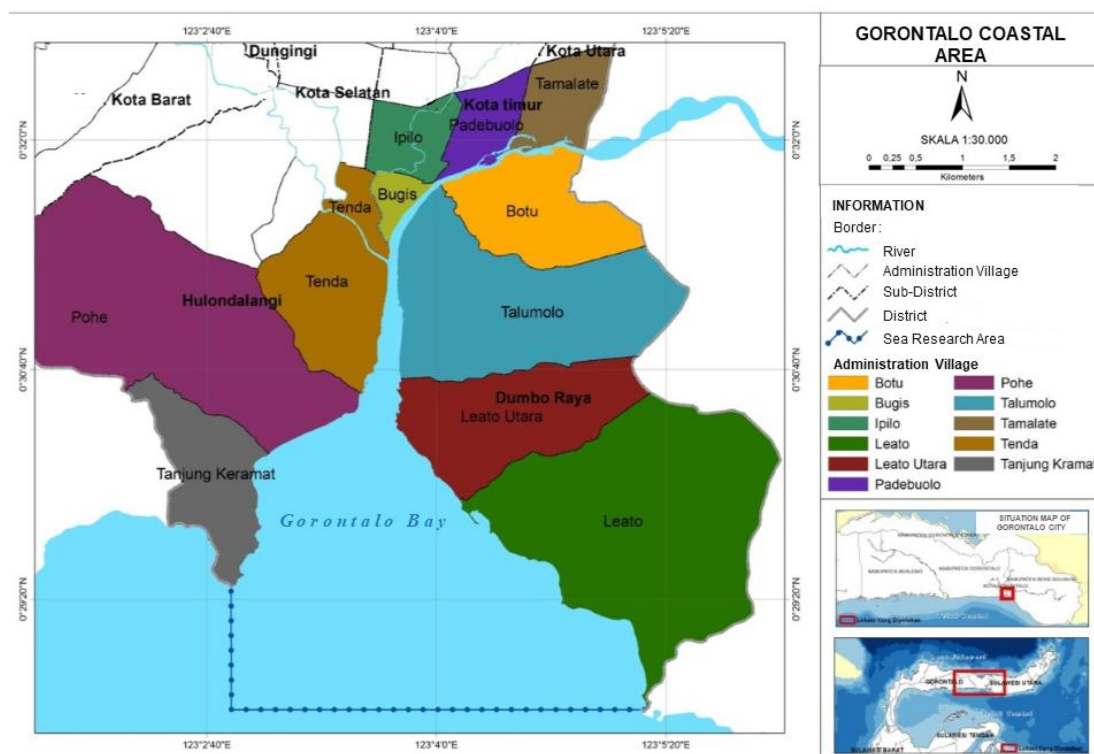


Figure 1. Site location: coastal area of Gorontalo City.

The questioner data were analyzed quantitatively. Data obtained from the survey was coded to order them uniformly. After data coding, the percent of respondent answer was further counted in the form of frequency table and cross tabulation table. The descriptive analysis was carried out by using descriptive statistics, which is a statistic used to analyze data by describing collected data. Data analysis was further presented in a cross tabulation table. The inferential technique analysis was conducted with inferential statistic. Data's were processed using software Microsoft Excel 2010. Fisher's Exact Test was used to see to what extent the different perception of the respondents (employee and non-employee) in providing answers whether they are happy or unhappy with the Happiness Index dimension. Data processing used the SPSS Program version 23.

Results. The result of the study indicates that the Happiness Index of the Gorontalo people living in the coastal area is 83.4 on a scale of 0–100. The higher the index is, the happier the community is, and vice versa. The number is reflecting the level of satisfaction towards the 10 important aspects of life which has different contribution level towards the index of happiness. It should be noted that the higher the contribution of the aspect is, the more important the factor is towards the index of happiness.

Based on the results of questionnaires distributed to 100 respondents, 94% stated that they are happy and just only 6% is not feeling happy. For both employee (civil servants) and non-employee (self-employed, fishermen, manual workers), more than 90% are experiencing happiness. According to the analysis, the harmony of family life rated as the highest aspect for the life satisfaction of the Gorontalo's community (82.37). While the lowest rate showed by the aspect of education (60.38). The level of satisfaction toward the 10 aspects of life is presented in Figure 2.

Fisher's Exact Test on the variables of happiness index revealed p-value 0.05, showing there is no difference between employees and non-employees in perception of the dimensions of Happiness Index.

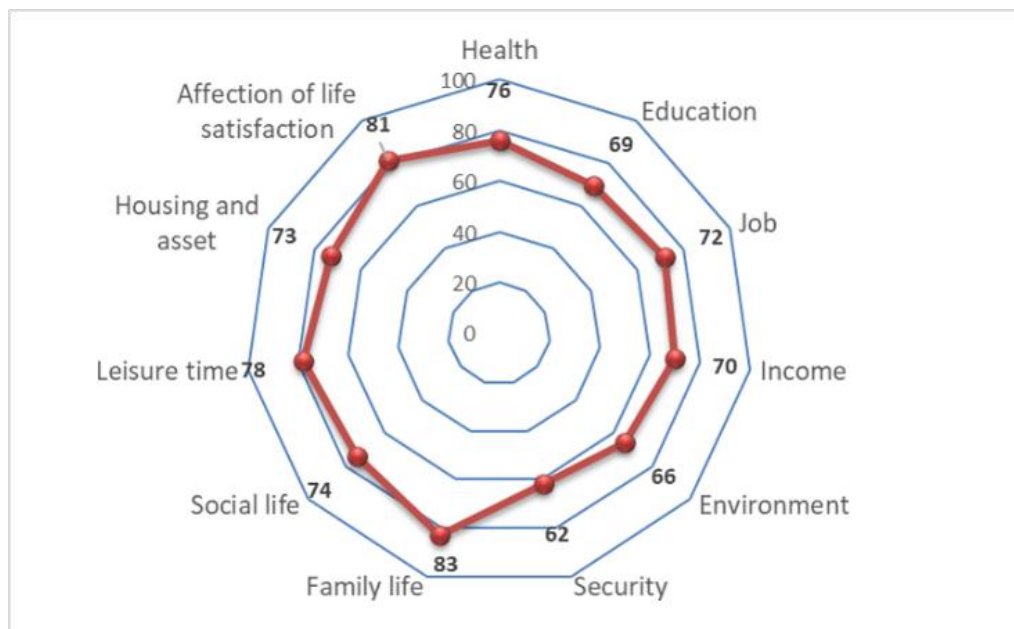


Figure 2. Satisfaction level of eleven life dimensions of coastal communities in Gorontalo City.

The figure shows that the level of satisfaction of coastal communities on health reached a score of 76. The community are quite satisfied with the health services provided among others, with the presence of health coverage such as BPJS/JKN, JPK for civil servants and pensioners (ASKES), insurances (JAMKESMAS and JAMKESDA), private health insurance, as well as the allowance/reimbursement of medical expenses from companies. Approximately 82% of respondents have health coverage. Health complaints

are generally caused by digestive disorders (stomach discomfort, nausea, diarrhea or constipation) (31.3%). While the psychosomatic disorders are only a few, such as, feeling nervous, tension, anxiety, excessive restlessness (7%); or often excessive fear (6%). In maintaining their health, 90% of the respondents simply rest or sleep adequately, do work-outs or physical activity (61.9%) and consume vitamins/supplements (38.8%). Interestingly when they are ill, 54.3% percent of the people choose to be not hospitalized. The reasons for not choosing inpatient or outpatient treatment are because they treat themselves for relief. Health is one predominating variables in measuring life satisfaction. When analyzing absolute levels of life satisfaction, Gwozdz & Sousa-Poza (2010) showed that life satisfaction declines rapidly due to low levels of perceived health. Their findings confirm that perceived health status significantly affect life satisfaction especially among the old generation. Vinson & Ericson (2012) found four variables as major predictors of life satisfaction encompass free choice and control over life, health, marriage and be a part of a local community. In fact, data shows that health services delivery such as the availability of Posyandu (health center at a village level) and medical doctors need to improve particularly in administrative villages under the administration of two new sub districts of Kecamatan Hulonthalangi dan Dumbo Raya.

A score of 69 describes the level of satisfaction toward education. The composition of the people living in the coastal areas are generally dominated by high school graduates (35%), junior high school (23%) and elementary (14%). Higher education level (bachelor or master degree) was represented by only 1% of the respondents. In general, the coastal communities of this city work in the private sector and fishermen. There is no, however, effort seen to improve their education level or increase their knowledge. In order to gain additional or increase knowledge people read newspaper and consult electronic media. This is supported by data that indicating the decrease in number of student who attend classes both at Elementary School (SD/MI) and (Junior High School (SLTP/MTs) in all administrative villages. Data shows that ratio of student-teacher is below the requirements as indicated by Minister of Education Act No. 23/2013 concerning Amendment to Minister of Education Act No. 15/2010 regarding Minimum Service Standard of Basic Education in District/City that is 32 for Elementary School (SD/MI) and 36 for (Junior High School (SLTP/MTs). Furthermore, number of elementary school (SD/MI) is still also under requirement as guided by Government Regulation (PP) No. 19/2005 about National Standard of Education. This is, in general, found in administrative village of Padebuolo, Pohe, Talumolo and Bugis. Furthermore, the lack of number of junior high schools (SMP/MTs) is found in administrative villages of Padebuolo, Ipilo, Talumolo and Bugis. Education has pivotal role in human life. It is, however, may depend partly on relative position rather than absolute levels. For the high-income group in which higher levels of education are attained the contribution of education to subjective wellbeing is not significant; nonetheless, the contribution to life satisfaction becomes significant for people attain a given level of education (Salinas-Jiménez et al 2011). However, human capital factors such as level of education contribute more substantively to life satisfaction for individuals (Vemuri et al 2011).

The level of satisfaction for job aspect scored 73 in the index of happiness. Community is satisfied enough with their work. Employments at the private sector, laborers and fishermen are dominant, respectively at 17%, 12% and 13%. Approximately 77% worked at least in the week before the interview. Interestingly the majority (62%) would like to do housework and only 31% other activities. The community is satisfied with their work for a variety of reasons. Nearly 92.9% are happy with the condition of workplace. Projection simulation in the Masterplan of Economic Zone Development of Sub-Districts in Gorontalo City of 2015, shows that in 2030 the Sub-district Kota Timur will be most populous zone among the three others. It means more jobs should be created mainly in the trade sectors. Focus should be given to develop more SMEs as more favorable jobs in the region.

The income aspect recorded a score of 70. The majority is able to saving some of their income at least once a month (54.5%) or other months (24.2%). The reasons vary that is 50.6% are saving for the future family/household, 45.8% are to finance

unforeseen needs, and only 3.6% are saving in order to avoid excessive consumption. However, 21.2% of the respondents do not have savings account at all. The reason is due to utilization of money to support business capital or investment (33.3%), feel no need to do saving (16.7%), or because the income is not sufficient enough to save up (40.7%). Under the limited income, however, the community is still able to reserve some spending for charity at least once a month (62.6%). A large part of the community (68.7%) feels that their income is sufficient. However, only 30.6% of them have pension plans. The most commonly effort to fill the gap when income is insufficient by adjusting needs or expenses. In fact, income is generally not the main factor to achieve happiness neither in developed nor in developing countries. In the future, the concept of happiness at country level will replace the wealth indicator of a nation, such as the GDP. In other words, the more advanced a nation is, the happier its citizens are (Veenhoven 2005). Boyce et al (2010) confirmed that absolute income and reference income have no effect on happiness. According to Delhey (2010), happiness perceived to be pretty materialist in poorer places, and more post-materialist in richer ones. In China, the variations in city size have an independent impact on residents' life satisfaction, particularly among the newest city dwellers Chen et al (2015).

The environmental aspect has score of 66. This score reflects a lower level of satisfaction due to the environment factor which is perceived as either moderately polluted (49%) or lightly polluted (36.7%). This can be seen from the condition of the Bone River, which crosses the villages. Respondents say that the river is experiencing turbidity (75.8%) and smelly (11.1%) which is contributed by garbage (51%), erosion (38.8%) and sedimentation (10.2%). In the last year, people experienced negative environmental impacts due to the floods that have been occurring more than once (28.3%). About 75% respondents concern that flood could mostly happen in this area. Gorontalo city is experiencing flood every year result in sedimentation in coastal area. Flood does not only take sediments but also chemical substances from upland areas. One alarming issue is the entry of mercury (Hg) to coastal water. This organic chemical originally comes from the mining activities in upland areas, which are dominated by gold mining's with no permissions. Salam et al (2016) found that Hg levels in the Bone River estuary at low tide exceed the maximum limit and below the maximum limit in the time of high tide. This is presumably caused by the influence of high tide to estuary water. Also, the excessive amount of total coliform recorded in the estuary waters reaches 2 500 MPN/100 mL, exceeding the threshold of Minister of Environment Decree No. 51/2004 concerning Marine Pollution and/or Damage Control for Seawater Quality for Ports of 1 000 MPN/100 mL (Regional Environment and Research Board, 2015). The high total coliform content is a result of the high input of waste entering the river. This is also exacerbated by the habit of people who are still discard they household black water in inadequate places; sometimes even directly in the river.

Security aspect has a score of 62. The city of Gorontalo is generally moderate conducive under a controlled security level. Despite the fact, crimes cannot be eliminated from public life. About 13% respondents say that they experience burglary more than once in the past year; 22% have experienced it once; but 65% convey never have experienced theft. Majority of the community have never suffered robbery/theft (88.8%), fraud/embezzlement (87.8%), destruction of goods (91.8%), sexual abuse (91.8%), and the attempted murder (92.9%). The community is also not bothered by brawls or mass fights as often occur in other areas. 13% says that this case occurred only once in the last year while 67.7% say it never happened. These finding indicates that security issues in the coastal area of Gorontalo city are relatively good.

The family life aspect's score is 83 and provides significant contribution towards the happiness of coastal communities of Gorontalo city. The happy family life is marked, inter alia, by the harmonious interaction and communication within the family. Approximately 91% of respondents say they communicate daily and only 7% communicate once in a week. Disputes are rarely happen, said 79% of the respondents and just only 14% say that there are frequent quarrels in the family. A mutual respect within the family contributed to the establishment of the good family atmosphere was reported by 97% of the respondents. About 60% express that they enjoy shared

activities including leisure time, dinner, watch TV, and others and only 10% rarely do these things. Interestingly, most of the families have joint decision-making procedure between the spouses when deciding certain things.

The social aspect of life has a score of 74. Concerning the social life of the respondents is generally characterized by good relation with their neighbors. 53% of the respondents know most of their neighbors and 57% of them frequently socialize and hang out with together. The trust within the neighbors is well-maintained. 57.6% of the respondents entrust their house to the neighbor when they travel or need to stay longer elsewhere. This mutual trust is awakened by various factors. Sohn (2010) found that social trust is positively related to happiness. It is, however, unclear whether social trust can increase happiness or not. Approximately 80.8% believe the role of religious figures in the neighborhood around the residence become a model or moral guide. Meanwhile, 82.8% believe that community leaders in the neighborhood around the residence play a role in helping resolve the problems of the citizens. However, despite this conducive social relation within the society, it turns out that only 26% are willing to help other people in need of financial aid. The remaining 59% do not have such willingness, while 10% are unsure. About 75.8% stated that when they need it would easily get financial aid from micro-finance institutions or banks. More than 70% agreed to frequently participate in public activities such building public facilities, religious celebrations, etc. Lim & Putman (2010) state that life satisfaction is more enjoyed by religious people due to regular attendance in religious activities. Contrary to atheists with the lowest level score of happiness, respondents who identified as religious had a higher average happiness, a mean of 3.31 on the happiness scale where 1 is not at all happy, and 4 is very happy (Vinson & Ericson 2012). It seems that religiosity enhances subjective well-being since religious organizations contribute to the presence of social interaction between likeminded people, fostering friendships and social ties (Lim & Putnam 2010).

The leisure time aspect recorded a score of 78. According to this score, most respondents have much time to enjoy togetherness or do activities with their family. The average leisure time is 77.6 hours per week, while the leisure time they spend without family is 57.8 hours. Approximately 90% say that they are either socialize with neighbors or watching TV and movies during their leisure time. DeLeire & Kalil (2010) who tested the relationship between spending expenses and happiness in a study entitled the Health and Retirement Study (HRS), represented by adult American people, found that spending that contribute towards happiness is the "leisure spending". Whereas expenses paid for charity, food, health, vehicle and residence are not significantly related to happiness.

The housing and asset aspect has a score of 73. Most of respondents (79%) have their own house to live in. Only 18% are residing at their parents or relatives house. This shows a level of well-being of the local community from the perspective of the household economy. The average of house sizes is 369 m² in which 87.8% have floor made out of wall floor, and only 5.1% from bamboos. About 83% inform that they have their own water disposal system; 87% say using electricity/gas/liquefied petroleum gas as the main fuel and 68% said using refillable water as drinking water sources.

For all life satisfaction aspects, the scored reached 81.60. This score indicates that Gorontalo community, in general, who is living in all coastal administrative villages are satisfied with their life. Around 70.75% said that they feel glad, carefree or joyful throughout their daily life at least within the last month. Approximately 74.10% said they easily forgive them who have done something wrong within the last month. In facing disasters such as death, accidents, etc., about 75.90% respondents said they are still patient in dealing with such events. Finally, 76.20% respondents feel that their hopes/desires have already been accomplished. In the ASEAN context, for example, the Asian culture and social values play an important role in influencing the condition of happiness of its member countries in comparison to their countries' economic structure (Yuen & Chu 2015). Social values, however, that related to religion and ethnic issues have no significant influence on happiness (Hariyanto 2017). According to Marans (2003), since millennium era is begun and population now resides in urban areas, it is important to examine the quality of life by measuring life satisfaction and happiness of the people.

Conclusions. Quality of life is a multi-dimensional issue in which many life domains are discussed. This study has mapped the state of quality of life among the community living in coastal area of Gorontalo City. The finding shows the linkage between quality of life and living environment as showed in the level of satisfaction with eleven life domains. The total score of eleven elements of life satisfaction shows that the community of Gorontalo living in the coastal administrative villages is satisfied with their behavioral life. Also, the index of happiness is at a moderate level (fairly happy) indicating that the coastal communities in Gorontalo City living in harmony with the living environment. In fact, community enjoys family harmony as it reaches the highest score. The community, however, is less satisfied with education aspect, which shows the lowest score in the index. In general, the community is adequate satisfied with health aspects, family activities, social trust, the ownership of own house and other relevant elements. It is, however, harmonious interaction and communication within the family plays a significant contribution to the happiness. Whereas, community is less satisfied with the surrounding environment due to pollution due to water turbidity and smell pollution. Floods that occur more than once every year have been contributing to the damage and influencing to social life. The moderate level of coastal community happiness of Gorontalo City implies the need for efforts to improve the performance of regional development, especially in education and living environment aspect. The Gorontalo City Government can carry this out by looking at the current condition and needs as well as the future projections. Strategic policies should also be taken with the Gorontalo Provincial Government in particular with regard to the upstream development activities (upland areas) to reduce environmental risks in the coastal areas of Gorontalo City.

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