

The Impact Of Climate Change On Maternal And Child Health

A Study From Indonesia



Why examining the impact of Climate Change

Calculation made for NDC indicated that, negative impact of climate change potential loss from environment damage measured 3.45% of GNP in 2100. As one of largest archipelago countries, some 42 million people living on low-lying land less than 10 meters above sea level, Indonesia is among the world's most vulnerable countries to sea level rise that potential to damage severely of the coastal areas.

Previous studies predicted that in 2050 there are approximately 23 million people at coastal areas experience annual flooding, approximately 2000 islands are potentially drown and severe damage of coastal ecosystem. Besides, the coastal community is considered as the poorest and the most vulnerable groups.

Although adaptation policy has included health impact of climate change, almost no mention on maternal and child health. On the other side, Indonesia puts priority to promote quality of human resources. While maternal and child health remain in unfavourable level, potential loss from climate change will exacerbate the condition of maternal and child health.

A study was initiated in 2022 by Pita Putih Indonesia an NGO works for promotion of maternal and neonatal health to reveal the findings from studies around the world how climate change has affected pregnant women and the outcomes of pregnancies and bring about what people experience in climate changing related to maternal health in the affected areas. This study is used for advocacy effort targeted to parties work for maternal and child health in raising awareness and promoting protection of maternal and child health from the impact of climate change.

What was revealed from the study

- Myriad of studies confirmed the relation between climate change and maternal and child health. Climate change has reverse impact to pregnancy and the outcomes. Many evidence have confirmed increased risk in pregnancy due to any form of climate change. The risks include hypertension, gestational diabetes, stress among pregnant women and even increasing violence against women. Infants are risked from preterm birth, low birth weight, infant death, birth defect, under nutrition and even cognitive impairment. Most studies confirmed excess risks related to climate change. It happens everywhere including in Indonesia.
- In most inhabited island, Jawa Island, its northern coast has been affected by sea level rising and extreme weather causing coastal abrasion. Other islands have also been

affected with different type of the impact on environment, including temperature rising, frequent flooding, strong winds, drought and land slides.

- The study in the affected areas showed what people experience in their daily life across period of their life. People observed degraded environment causing reduction of source of water and food, changing climate and its impact on agriculture, reduction of fish production and catching, changing food pattern with missing of fish, more vulnerable children to sickness and increase risks in pregnancy among the women villager.
- Although health aspect is part of adaptation policy in NDC, it misses maternal and child health from its vision.
- Government response mainly to address physical impact of climate change. Local government initiatives were activities on rehabilitation and prevention of physical environment degradation, economic empowerment, and rehabilitation of settlement, but have not touched health, even further, maternal and child health.

How the study was done

The study used two approach.

One was literature review of studies that have been conducted in many places of the world. To see what are the impact of climate change to maternal, neonatal and child health.

Second was an explorative study in the coastal areas of Ketapang, Marga Mulya and Tanjung Anom villages in Tangerang regency, Jayamulya and Cemarajaya villages in Karawang regency, just next to the Capital Jakarta, and Kedungsalam village in Malang regency East Java.



Explorative approaches used Focused Group Discussion of women and men at study location to collect information on how the environment changed overtime, what they experience and what they observe in daily life related to livelihood and health. Interview was also used to collect information from officials of local government agencies for health, environment, social affair, community health centers and head of villages on initiatives made to address the changing climate and its impact.

Key Findings

1

**The impact of climate change
on maternal and child health**

2

Environmental Changes

3

Socioeconomic changes

4

The changing of health situation

5

Government response

1. The impact of climate change on maternal and child health

Findings from studies around the world revealed evidence on the impact of climate change on maternal and child health. The list below describes what is the impact and where the study conducted.

Climate change	Adverse effect	Location of studies
Heat and cold	Pre term Birth	North America, Europe, Australia, New Zealand, Sub Sahara, China
	Still birth	North America, Europe, Australia, New Zealand, Sub Sahara, China
	Low Birth weight	North America, Europe, Australia, New Zealand, Sub Sahara, China, Bolivia, Peru,
	Infant Death	USA,
	Higher pre and eclampsia when conception occurs during higher temperature	USA, South Africa, Israel
	Congenital anomalies	USA, Canada, Israel, Turkey, Iran, Mexico
	Higher Pre eclampsia and eclampsia during cold and rainy seasons	India, Norway, Australia
	Gestational Diabetes Mellitus on cardio vascular disease	China
	Gestational Diabetes Mellitus	USA, Australia
	Pneumonia in children	China
Wild fires	Low birth weight, preterm birth	USA California, Italy, Brazil
	Birth defect	USA, Brazil
	Psychological impact	
Climate change	Adverse effect	Location of studies
Extreme weather Storm, hurricane, typhoon, flood	Low birth weight, pre term birth, fetal distress, fetal death, Post-traumatic Stress Disorder	USA, Thailand, Poland,
	Cognitive impairment	China
	Impact on children death	Srilanka
Drought	Low birth weight	Bangladesh, Malawi
Sea level rising	Hypertension	Bangladesh
Pollution: Air (SO ₂ , NO ₂ , PM _{2.5})	Low birth weight	China
	Hypertension	China
	Pre term birth	
	Birth defect	China
Pollution chemical	Birth defect	
	Abortion, Pre term birth	India
	Autism	Finland
	Leucemia	
Nutrition	Low birth weight	
	Stunting	
Social impact	Violence	USA, India

2. Environmental Changes

a. Coastal Degradation causes loss of natural resources

Being in coastal area people experience the movement of coastal line. In the abrasion area they notice that coastal line moves deeper to the land. La Nina phenomenon has been more frequent and sea level rising evoked flooding in this area. During monsoon, sea water arose, causing tidal flood and penetrate up to 4-5 km toward the land. Previously farmland and fish and shrimp cultivation ponds have been replaced by inundation of sea water. In certain area, part of the village has become separated island. Many people's house have been destroyed by flood and enforced them to evacuate and move.

Abrasion has changed the landscape of the villages. Marine life along the coast has also been affected, fish become scares and sea weed is gone. Rising seawater temperatures bleach coral reefs and releasing algae that produce nutrients for coral reefs and make the coral die.

Coastal abrasion has eroded agriculture areas and fish and shrimp cultivation ponds causing lower productive areas. In higher areas, rice cultivation become harder with erratic weather and irregular season. Drought has reduced ground water resources severely. Rice cultivation becomes harder and people just plant corn or legumes. In recent years, monsoon is longer but with less precipitation.

Increasing sea water level around Java island is estimated to drown, thousands of hectare of rice field. Fishery has been affected by damaged coastal areas, extreme weather and irregular season. Degraded marine biota has reduced the amount of fish that enforced fishermen to sail further under unsafe weather condition.

b. Rising sea water damaged water and sanitation

Tidal flood become more frequent. Sea water have reached residential areas and the abrasion has damaged the homes of the community. Sewage stream have also been affected, resulting in dirty environment. It is difficult to make septic tank as the soil becomes watery.

Rising sea level has also caused sea water intrusion. Water sources can no longer be used, water becomes salty. Sea water intrusion has made water becomes salty and to get clean water, people have to buy and use pipe water which is also limited.

c. Abrasion hampers access to health facilities

In Karawang, the damage caused by flood and abrasion has broken roads. This condition hampered transportation and lessen access to health facilities. People may get delay for health treatment with this situation. The nearest health facility becomes difficult to reach from the village, while mobile health service is infrequent through Village Health Post.

3. Socioeconomic changes

a. Reduction of Family Income due to climate crisis

Villagers have been seeing the changes in their livelihood and observe what changes happen and the difference in situation from time to time. The impact of climate crisis has reduced the availability of nature as resources for local economic activities. Local community have to find new jobs and face that fact of income loss.

Previously fish and seaweed producing village, has changed to less productive area and some has changed into tourist destination. The left over fish that can be caught, now only sold to visitors and seaweed is no longer source of family income. Given more limited amount of what the sea can now offer, they rely on tourism related works, such as open or work at kiosks, food stall or restaurant, souvenir shops, or renting rooms. The others became seasonal farmer or worker in other places.

Before abrasion damaged their land, people previously live from shrimp, fish, crab and shellfish cultivation which they earned enough to support family needs. The changing climate with rising sea level and rob flooding has destroyed their ponds, their main source of income. If in the past, women used to work in water melon and coconut farm, now they work in shellfish processing depots. Nowadays, on average farmer could only get half of previous harvest. Many people have to rely on uncertain temporary jobs and villages are no longer prosperous.

b. Women have more burden on domestic and economic works

People feel that ambient temperature has become hotter compared to 10 years or longer ago. People also noticed the changing of dry and rainy season becoming more erratic. Meteorology office recorded the increase of temperature during last 30 years and showed an increase of average temperature from 1983 to 2016 by 1.56 degrees Celsius. Water sources diminishing and some rivers previously used for domestic purposes tend to dry.

Decreased income with scarce natural resources, drought, eroded farmland, destroyed coral, lessen fish catch has pushed women to involve more to earn the living. They have to work to support family income or work harder with more scarce natural resources. Women's burden has become heavier and even worse when rob brings flood to their homes. During drought, women have to spend more time for collecting water and now they have to que to wash in the river. Many businesses required water to process the product like washing raw material have to refrain as the water sources becomes limited.

"In 2017, this village experienced long drought season. More than six month we suffer from having clean water for domestic works as well for our economic productive activities. We are, women, had to stop all economic activities since we had to focus on domestic works. We have to walk about 2 km to reach the river, the only water sources available. Sometimes we spent almost all day here since have to que". – Mistinah, 45, Malang regency.

For rural women who rely on natural resources for their life, climate change causes heavier domestic burden due to scarcity of clean water. In some region, women have to spend their time from light to dark.

The use of contraceptives among married women, mostly injectable perceived to be a safer method is a logical choice in where economic distress occurs. They consider it as a way to reduce domestic burden of child bearing and caring for the risk of getting pregnant.

c. Loss of economic resources leads to further social issues

The changing situation of environment that has created impact on social and economic circumstances has affected women in any extent. In Karawang, social problem was added with increased juvenile delinquency, increased adolescent marriage and even child prostitution.

4. The changing of health situation

a. Extreme Fluctuation of Air Temperature Leads to More Health Complaints

Villagers feel the air temperature can be very chill during transition of dry to rainy season and become much hotter during the dry season. Hot spell felt hotter while cold felt much colder than before. Women feel headache and stressful more with heat. They observe more joint and bone complaints with the more extreme fluctuation of the weather.

Other diseases noticed were the increasing cases of cardio vascular diseases and diabetes among the elderly and skin irritation among them who still live close to sea water. They also noticed diarrheal and upper respiratory tract infection among the children. In Karawang regency, the people noticed frequent occurrence of Dengue Fever cases and Malaria. Many water spots might relate to it.

b. Changing of family food pattern and decrease of protein intake

Significant reduction of sea product has changed people's consumption pattern. Protein from fish is changed with vegetable protein, sometime with egg. Vegetable protein is more available and cheaper compared to fish. Fish previously abundant and cheap, is now scarce and expensive. Consumption pattern is different now, compared to early years of people's childhood. Habit to get more practical food becomes common. Even instant noodle now becoming common food for the children. This changing food pattern has erased fish or other sea food from daily menu. The women believe that fish protein builds immunity and health particularly among children. They notice more frequent and lengthy cold and other diseases among the children. Current sick days are now longer than that in the past. Herbal use in the old time can no longer cure and replaced by medicine.

“This village was known as a place with abundant of fish and seaweed. These were our source for livelihood and daily family food consumption. Since I got married and became a mother almost none of fish in our family food. We change it with vegetable protein like tofu and soybean cake. This might be the reason for decreasing immunity among pregnant women and children”. Yani-43, villager in Malang regency

c. Sea water intrusion lead to the hypertension disorder of pregnant women

Women villager noticed that they see more hypertension than several years later. The saltwater encroaching on drinkable water, the salt intake for the whole communities' increases and it has a big impact on maternal health as it could lead to hypertensive disorders in pregnancy, such as pre-eclampsia.

Women observed increased pregnancy complication such as, spontaneous abortion, premature births and pregnancy with hypertension which enforced them to send the women to hospital for delivery. They also noticed that several families of reproductive ages experienced infertility, increasing cases of changing pattern and more painful menstruation among adolescents.

d. Scarcity of Clean water and women reproductive health

During long dry season the women face difficulties to find water for their reproductive health needs. Women needs more water for cleaning during menstruation. The absence of sufficient water causes of itching and bad odor. Among pregnant women domestic works becomes harder and affecting their pregnancy and babies.



5. Government response

The impact of climate change on maternal and child health has not been included in government adaptation policy neither local government. Adaptation policy put priority on communicable and vector borne diseases. No mention yet, for maternal and child health. Accordingly data describing the issue is limited if not none. Similarly at sub national level, the regencies. Local government is not aware of the impact of climate change on maternal and child health. There was no study to examine the relation between changing climate and diseases pattern.

Climate policy is implemented at local government, but more of physical and environment concern. Local government initiatives are aimed more to address the impact of disaster including hydrometeorological disaster. In some area, affected villages are included in disaster resilient village (Desa Tangguh) program as one of disaster mitigation measures. The community is empowered through training activities to mitigate and strengthen preparedness against disaster.



Community Health Centers were strengthened to cope the possible health impact in disaster prone areas.

Local government also run program called Coastal Community Development movement aimed to strengthen economic activities by development of business center, culinary industry and other modalities to improve economy of the people. This program also rearrange settlement areas, mangrove rehabilitation, improvement of irrigation and rehabilitation of water reservoirs and building breakwaters to protect coastal areas. However the program and support has not yet cover all of the needs of affected population. Collaboration with NGOs and companies through their corporate social responsibility is also done. National government also put effort through strengthening of people's resilience so called ProKlim Village program focused on adaptation and prevention of environment degradation.

Recommendation

Given the importance of human resources, the crucial timing of human development and protecting the rights of women and children, the study recommends:

- (1) Inclusion of maternal and child health issues and its indicators in climate change adaptation strategy;
- (2) Awareness raising on the impact of climate change on maternal and child health among parties and stakeholders work for maternal and child health promotion at national, sub national and community levels;
- (3) Promotion of research and improve data system to include the impact of climate change on maternal and child health, including potentials of the community in mitigation and adaptation;
- (4) Promotion of collaboration among all stakeholders in the government, professionals, civil society work for maternal and child health and wellbeing to address the issues;
- (5) Collaboration of international community, to allocate resources and support protection of mother and children from negative impact of climate change.

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