

Enhancing People Resilience toward the Impact of Climate Change on Human Health: Community Based Risk Assessment in 9 villages in Indonesia¹

Abstract

In Indonesia, natural calamities such as earthquake, volcano eruption and seasonal drought and flooding have occurred from time to time far before the CC issues were exposed and these have become key causes of the decreasing of people welfare and health status. The accelerating impact of the climate change has further worsened the health situation of people, especially the vulnerable segments of the population such as the poor. At village level the accessibility to health services is limited and survival of the poor depends to the existing traditional social support system.

Currently the supportive social fabric of the rural communities has been negatively affected by modernization, economy centered development strategy and top down project oriented interventions and this has increased vulnerability to CC impact. In the last decade CC related hazards such as flooding and landslides has increased significantly and this has increased exposure in term of number of the poor in the affected areas. These hazards have been perceived by the general population as related to local or regional environmental damages due deforestation, bad waste management, urbanization and bad development planning rather than as global warming issue.

This project intends to improve the resilience of the most vulnerable segments of the population of 9 pilot villages toward the health impact of climate change through risks reduction. The project interventions are focused to build the grassroots capacity for reduction of vulnerability through: (1) the increasing of people knowledge and awareness on climate change and its public health impacts; (2) re-strengthening the supportive social system of the communities; (3) facilitation of community based initiatives for health impacts mitigation; and (4) facilitation of network of stakeholders

The selection of 9 pilot interventions/villages is based on three criterions; i.e. the variety of possible public health impacts of CC; geographical settings which will determine the type of CC related hazards; and cultural/traditional background of the population

RATIONALE : DISEASE RELATED CLIMATE IN INDONESIA

Indonesia is an archipelagos country with total population reach almost 237 million people. It comprised by 17,508 islands lies upon of equator line from Sabang in west to Merauke in the East. With 80,000 kilometers (50,000 mi) of coastal line, Indonesia also becomes the longest coastal line's country in the world. Among other island, Java become the most populous island in Indonesia, and even in the world with about 160 million inhabitant.

Majority of the people depend on agrarian resources; land and seas, as farmers or fisheries for living. Rapid industrialization and green revolution since 1970s created urbanization and slump area in many urban centres in Indonesia.

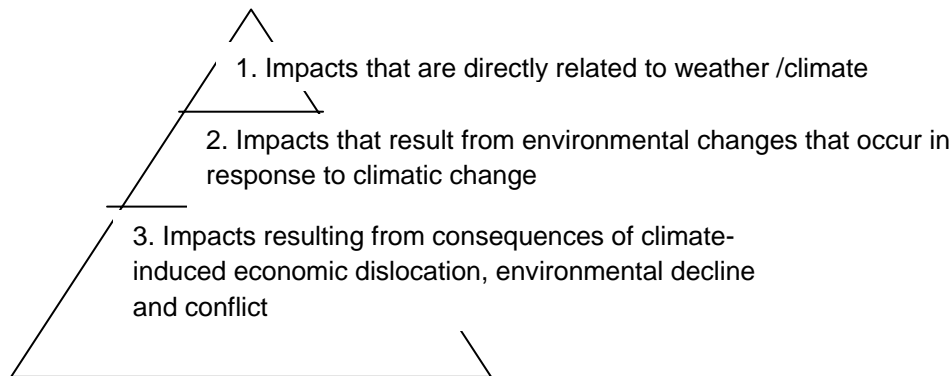
When the Global Forum endorsed the need to achieve the eight Millennium Development Goals (MDGs) in 2000, climate change was just beginning to be recognized and its widespread effects on health were largely unclear. Now that we know more, it would be irresponsible not to employ our efforts to sensitize key players and initiate research to

¹ Presented by Sigit Wijayanta PhD, Executive Director of Christian Foundation for Public Health (Yakkum) on Climate Change and Health Conference, Haus am Schuberg, Hamburg, 25-26 September 2009.

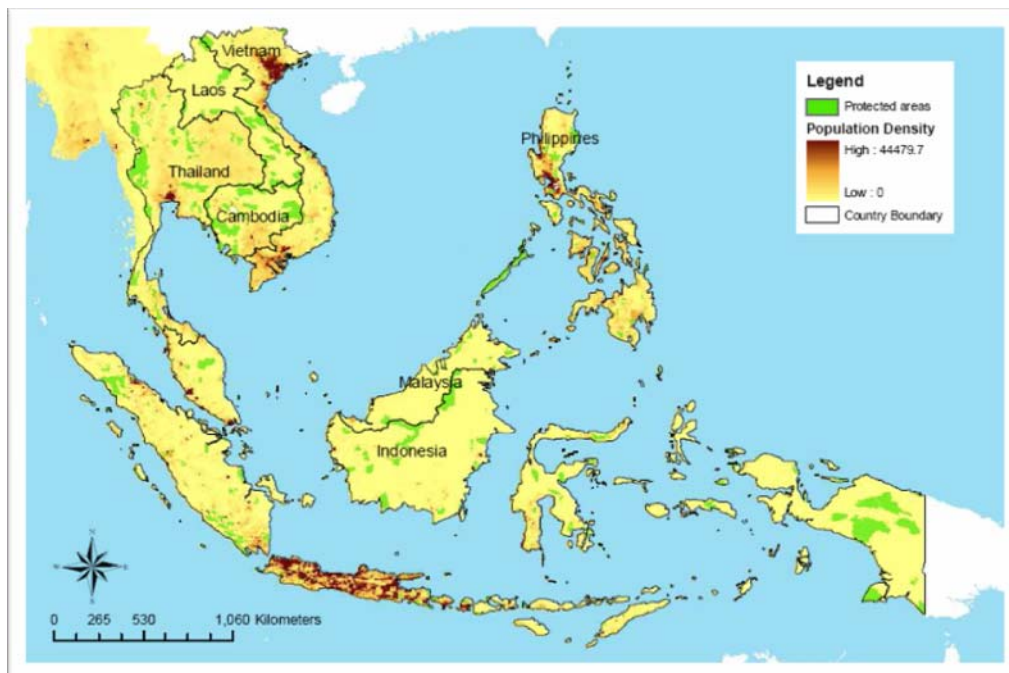
combat this latest health **threat that adds to and exacerbates existing ones**. The concern with climate change will complement efforts to achieve the MDGs, not detract from them.

Figure 1 postulates the three broad categories of health impacts to result from changing climatic conditions²

Figure 1: Three broad categories of health impacts



Officially, 16 percent of the population lives under poverty line where most of the poor live in rural areas. Asian financial crisis in 1997/98, where Indonesia was hit most, worsened economic capacity. Privatization of public services, including health services, as the main economic policies decreased accessibility and affordability of people to access right, including right to health.



Various impacts and hazard of climate change had suffered by Indonesia; since raising sea levels to extreme climate change such drought and floods. In particular to health, global

² as given in Ebi, from McMichael 2001 IPCC Health.

warming also increasing sufficient conditions pests and disease. As been studied by Dr. Paul Epstein, global warming had created wide-ranging impacts on human health.³

In Indonesia we found some evidences that increasing temperature caused by global warming, from 25.26° to 27° C, is ideal condition for breeding of mosquitoes. For example, because of mosquitoes, Malaria still becomes big problem in Indonesia. For Malaria, we had counted 1.6 million cases with 700 mortality rate. The highest rate of Malaria still in East Nusa Tenggara with 16,290 infections and the rate in Java and Bali increasing from 18 cases per 100,000 inhabitants in 1998 to 48 cases per 100,000 inhabitants in 2000. For other areas outside Java, in average, the rate of increasing of malaria cases almost 60% at the same period.

Other cases caused by mosquitoes can be found from the DHF data. In Central Java for example, the DHF cases increased about 40% each year, from 6,586 cases in 2006 to 11,424 cases during the first half year of 2009. The yearly average of the mortality rate for the last 4 years is 232 cases.

The other case is ARI. Since last 10 years, ARI remain the first rank of the diseases in Indonesia with high mortality mostly in drought and poor provinces in Indonesia, i.e. East Nusa Tenggara. Vascular diseases, like stroke, heart diseases, thrombosis, morbidity and mortality rate increased to 40% as well as in urban and rural areas.

Climate change and global warming also were increasing the hazard of disaster, in term of frequency and magnitude. Until now, because of so many disasters, at least 18,195,948 peoples were affected. Among those, 40% morbidity and 5% injury and rate of mortality reach 189,615 peoples. Disaster also created disability. In Yogyakarta, disability that caused by disaster reached 33.000 peoples. Drought and floods made the highest mortality rate because of diarrhea. Until now, in Indonesia diarrhea in general are still becomes the second killer of the infants and the fifth killer of children in all age. 162.000 infant deaths or 460 infant killed by Diarrhea.

Drought also brought problems in Indonesia. El nino were predicted will decrease 27% of the rice production and therefore raise issue of malnutrition and hunger. Malnutrition as impact of drought had suffered by at least 2.3 million people in whole country. A further impact of lack of food in Indonesia and respectively related with the need of more rice subsidies for the poor and a higher budget in the Indonesian budget to Import rice.

Climate extreme change anomaly also predicted will decline of physical endurance, Easy expose for different virus; Increase the vulnerability of children and elderly people; mental health problems.

Instead of impact of climate change, economic crisis in Indonesia had prevented Indonesia from achieving MDGs targets. For Goal 1; eradicate extreme poverty and hunger, the USD14.125 million investments for poverty alleviation in the last 4 years, only impacted to 1% decreased. Until now, 27 million people live below poverty and under nourished baby reached 2.3 million people.

³ Martin Jalleh, A changing climate for disease and death, Third World Network. Retrieved from Ibon Primer on Climate Change. Ibon International. 2008. Page 10

Impact of CC to MDG's Target Achievement?

- **Goal 1: Eradicate extreme poverty and hunger.** Indonesians government had invested 14.125 million USD for poverty alleviation in the last 4 years, but the number of people below poverty line has only decreased 1% (27 million live bellow national poverty line). Under nourished: 2.3 Million people. Surely CC has increase the poverty.
- **Goal 4: Reduce Child Mortality.** The infant mortality rate in Indonesia is 40. The highest rates are in poor and drought provinces. The MDG target of IMR at 23 in 2015 in challenged.
- **Goal 5: Improve Maternal Health.** MMR 420 the highest among the other ASEAN countries. To reach MMR at 200 would be a dream.
- **Goal 6: Combat HIV/AIDS and other infectious diseases. Reported** HIV/AIDS in Indonesia 16 110 (estimate cases 193 030), while Malaria: 1,6 million cases with 700 mortality rate.
- **Goal 7: Ensure Environmental Sustainability (water and sanitation):** Access for drinking water is decreased due to calamities

ASSESSING ON PEOPLE VULNERABILITY AND RESILIENCE TOWARD THE IMPACT OF CLIMATE CHANGE CONCERNING HUMAN HEALTH IN INDONESIA

Conditions as been presented above are rationale of research on people vulnerability and resilience toward the impact of climate change concerning human health in Indonesia.

Objective

Objectives of the research are:

1. To understand the peoples perspective in their vulnerability toward impact of CC, especially in their health
2. To discover peoples resilience to survive from the impact of CC, especially in their health
3. To recommend the expected capacity building to enhance the resilience and capacity of the people
4. To recommend the needed advocacy work to enhance the resilience and capacity of the people

Theoretical Framework

According to the United Nations International Strategy for Disaster Reduction Secretariata⁴, a "risk" is defined as follows:

Risk, Hazard, and Vulnerability

⁴ a United Nations International Strategy for Disaster Reduction Secretariat Basic Terminology: www.unisdr.org/eng/library/lib-terminology-eng-2004.htm

The terms “risk,” “hazard,” and “vulnerability” have been used in many confusing and contradictory ways. Adaptation practitioners generally use these terms in the same way that disaster risk reduction and hazard management specialists do. The UNISDR presents these terms together in the following equation:

Risk = Hazard x Exposure x Vulnerability

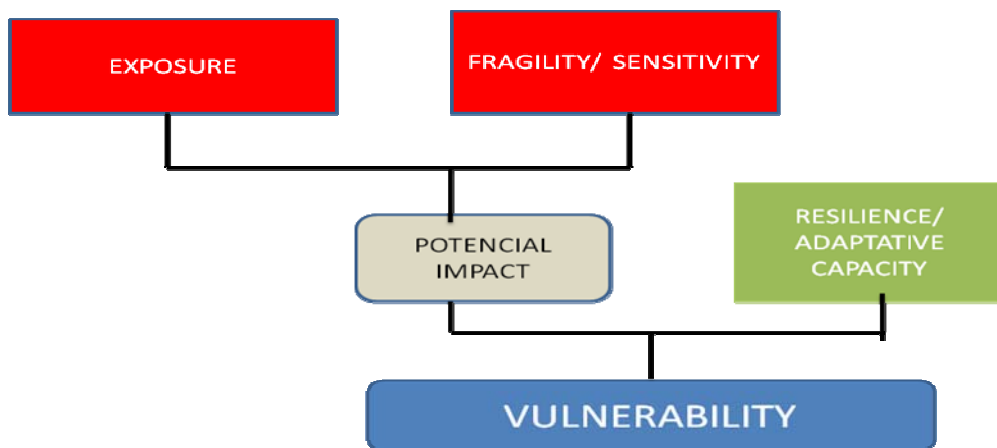
Where:

- Overall **risk** of damage or losses is determined by the nature, intensity, and frequency of the **hazard**, (e.g., the frequency of flood of a certain level);
- **Exposure** to a hazard (e.g., the number of people living on a floodplain); and
- **Vulnerability** to the hazard (e.g., the conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards).

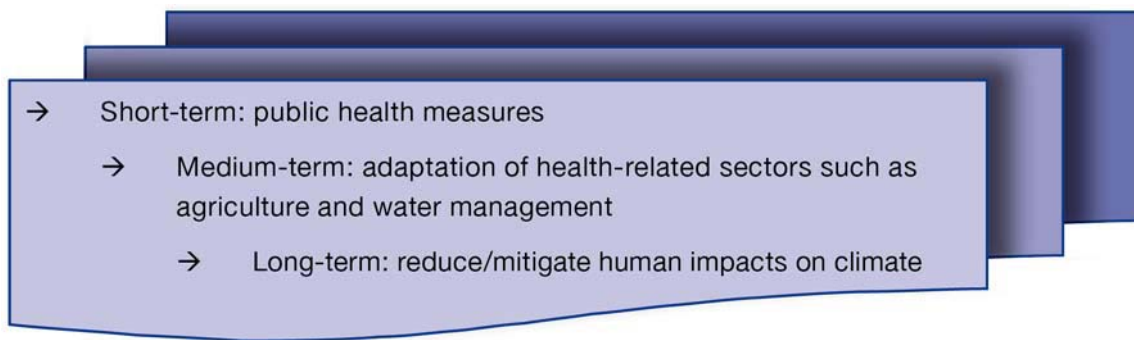
For instance, climate change will alter the frequency and intensity of hazards; population increase and settlement patterns will change **exposure**; and social, economic, and environmental factors will change **vulnerability**. Adaptation seeks to reduce **exposure** and **vulnerability** to the hazards associated with climate change impacts.

To assess the people vulnerability and resilience toward impact of CC, we develop theoretical framework by assuming that risk assessment of impact of CC as impact of hazard combined by vulnerability and capacity. Vulnerability is combination between exposure, fragility, and resilience. Hazard is counted by multiplying magnitude with frequency.

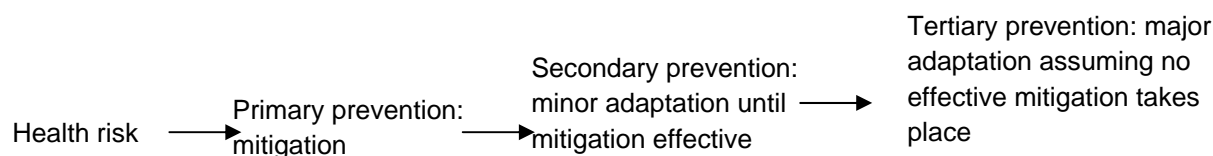
Hazard	= Magnitude x Frequency
Vulnerability	= Exposure + Fragility + Resilience
Risk assessment of impact of CC	= <u>Hazard x Vulnerability</u> Capacity
Disaster	= Hazard x Vulnerability-Capacity



Responses to prepare for the impact of climate change on health



Planing process of community based adaptation and mitigation are as follows:



Guided Hypothesis

1. Magnitude and Frequency of hazards are felt increased
2. The fragility of the people is also felt increased
3. The level of fragility is correlated with the availability of better life conditions.
4. The level of resilience will depend on the felt potential impact and awereness of Impact of CC
5. Resilience is correlated with traditional Survival Life adaptation and the level of external Intervention.

Methodology

1. Type of Study: Participatory Action Research
2. Area of study :5 Villages in Java, 2 Villages in East Nusa Tenggara, 2 village in sumatra
3. Data Collection Method: Focus group Discussions
4. Data analyses Method : (1) Focus Group discussion guided by Vulnerability and Resilience Frame work & hypothesis. (2) Stakeholder workshop attended by Government-people organization and representative of all dept in hospital) for Plan of Action
5. Research Team
 - a) Field Focus Group implementation : 7 units of CD Unit of Yakkum Hospitals , Yakkum Emergency Unit (YEU) and Yakkum Central Rehabilitation Unit.
 - b) Principal Investigator : Sigit Wijayanta, Supported by Climate Change Task Force of Yakkum (Kedri -CD Betheda, Nicolas –YEU; - Syamsul – Yakkum Jakarta Advocacy Office etc)
6. Time Frame :
 - FGD in 9 villages (June-August 2009)
 - Stake holder Workshop for Intervention planning in 5 cities (7 – 16 September)
 - Sept 2009-sept 2010 (First Intervention – Supported by EED)

SUMMARY OF FGD & STAKE HOLDER WORKSHOP

Case 1: Bandar Harjo, Semarang.

Bandar Harjo is urban-coastal area in Semarang, Capital city of Central java Province. Inhabited by 2.311 people, majority work in informal sector or dockworkers, and 20% of population are below poverty line. Since 1992, sea level from Java Sea had risen and flooded Bandar Harjo. Magnitude of flood had expanded almost 500% since 1992. Areas that had been flooded by sea water reach 1000 meter from the beach. ARI, diarrhea, Myalgia, TB, DHF Skin diseases, women anemia become to fifth biggest health problem in Bandarharjo. Citizens tended to assumed that the root of problem is project of city reclamation. Health service accessibility and active health volunteers are the factor of resilience at local level. Focus of resilience done by Yakkum Citarum Hospital Semarang is how could the outbreak of diarrhea and Dengue be decreased during SLR (sea level rise) by managing the sanitation system and the disposal also problem of child malnutrition.

Case 2: Purwosari, Semarang.

Purwosari is an urban slum area in Semarang , lived by 9,051 inhabitants, majority working in formal sectors, and 20% live under poverty line. As well as Bandar Harjo, floods because of raising sea level become environmental problem in that area. Purwosari suffered by SLR since 2005, since 2007 rob had increased 400% and area that had been exposed almost 100 m from river bank. ARI, Diarrhea, degenerative diseases among the elders, Mental Health and DHF become the most health problem in Purwosari. There are strong social system and active health volunteers that can be counted as factor of local resilience. The nearest Yakkum hospitals that is Cipto Hospital Semarang, focus their program for mental health and holistic geriatric program to decrease the risk of Cardio Vaculair and stroke, especially duriang SLR.

Case 3: Wonotirto, Temanggung.

Characteristic of Wonotirto is a rural at highland area, inhabited by 4,025 peoples, and majority work as farmers. Hazard in that area were usually caused by small tropical cyclone which used to be happened in December to January. Since 2006, the cycles of cyclone were become unpredictable and almost happened every month. In the last two years, magnitude of hazard from medium to high. In average, the cyclone destroyed 5 to 7 hectares. People assumed that the hazard caused by deforestation, erosion, and superstitious or supernatural effect. Some Variables of fragility in Wonotirto are on the level of education where 60% of the people were never goes to school, 20% people live under poverty line. Health hazard in that area were composed by ARI, diarrhea, Allergy, and undernourished children, and the coming increase of HIV case due to high migration. Wonotirto still had a strong social system, however because of modernization there is no rice-barn system left in that village. Social system of the communities also suppress by usuries and no active health post. Yakkum Ngesti Waluyo Hospital Parakan, are now trying to intervenes the condition by trying to increase status of nutrition of the children during the expose of hazard and also to decrease the HIV infection rate..

Case 4: Donomulyo, Lampung.

Donomulyo is a rural low-land area, lived by 6,331 inhabitants, majority working as farmer, fisherman, and informal sectors. Droughts and floods alternately every year. The frequency of flood and drought had double increase since 2003. Magnitude of flood and drought were categorized medium to high magnitude. About 60% of farmlands were destroyed by flood and drought, food production were decreased almost 55%. The cause that understandable by local people is changing of farming to mining activities. Area that had been exposed by hazard is near 100 m to 1 km from the river, sometimes in almost all areas. Majority of peoples were only had basic education and almost 30% of people were live under poverty line. However, there are still a strong social system, active health post/village health post, there also had a village level cooperative, and now develop the use of alternative medicine/herb. Resilience of the people can be increased by developing the food diversity and ensure a good and sufficient nutrition for the children. Unit Implementation: Mardi Waluyo Hospital Lampung.

Case 5: Limpakuwus, Purwokerto.

Limpakuwus is a rural low-land area, inhabited by 5406 inhabitants, majority working as farmer. Droughts had doubled since 2006. Magnitude is categorized medium to high magnitude. About 50% of food production was decreased. The cause that understandable by local people are deforestation, population growth, low education-small migration. Area that had been exposed by hazard is near 100 m to 1 km from the river, sometimes in almost all areas. Hazard was exposed 100m to 1 km from the river and impacted in all area. In Limpakuwus, almost 80% of the population is under poverty line, access to health services is costly, ranking of diseases comprised by ARI, diarrhea, and skin. Limpakuwus still had a strong social system and to anticipate the health service, people are using alternative medicine or herb. Current resilience focus is on how to increase the variety of food to maintain the status of nutrition of the children during the drought. Yakkum Unit Implementor to response this problem are Sinar Kasih Hospital –Purwokerto.

Case 6: Ngabenrejo, Grobogan.

Ngabenrejo is a rural low-land area, inhabited by 4965 inhabitants, majority working as farmer, fishermen and informal sectors. During the last 5 years, floods were always happened, especially when rainy season. It always decreased farm productivity to 50%. People were assumed that the roots of problem are deforestation and its impact to sedimentation on the river. Floods were exposed 100 m to 1 km, in some, almost covered all areas. About 40% of the population lived below poverty line, access to health service also problem because far and costly. Ranking of diseases in that area are; (1) DHF, (2) diarrhea; (3) skin. However, people had a strong social system and now developing the system of housing that adaptable to the condition of local environment. Panti Rahayu Hospital, as the Yakkum units focus their intervention mainly on how to decrease the death rate of DHF.

Case 7: Hambrapraing and Haideha, East Sumba, East Nusa Tenggara.

Population of Hambrapraing is about 1409 inhabitants. Around 30% among them are uneducated and 60% only had basic education. Majority lives as farmer or livestock labor. Local hazard caused by drought and savannah burning. It happened every year and every 4 years drought had longer cycle. People assumed deforestation of the neighbor village as the

cause of drought. The critical time for savannah burning and heat are on September to October. During that period, livestock were dying because of heat. Therefore, food shortage will always happen during February. Poverty, usuries, and expensive cost for custom or ritual ceremonies increase the fragility of the people. People believe in traditional calendar of hazard and mandara system (food barter) to sustain their living. Focus on resilience program at that area is to build the food barn system as the way to increase nutrition status of the children. Unit Implementor : CD Bethesda Hospital.

Case 8: Margabakti, Bengkulu.

Margabakti is populated by 1975 inhabitants. Around 95% works as farmers, 85% were only basic to higher level of education, and most of the population were originally came from Java as “trans-migrant”. Drought is become the major problem in that area. Drought and decreasing of rainy season halted the changing of food diversity. Amount of products tended to decrease and it cover almost all areas. Poverty, consumerism, and lack of public service become the variables of fragility at local community. In Margabakti, people had high social resilience but did not support by sufficient technical resiliencies. The current resilien focus is to maintain or increasing the food diversity as the way to improve status of nutrition for children during the drought season. Unit Implementor : Yakkum Emergency Unit.

Case 9: in Karang Mojo Yogyakarta

Climate changes also predicted increase the CP cases and the quality of life of difable. Data from Yakkum Rehabilitation Center in Karangmojo, Yogyakarta showed that the rate of difable increase 7% annually, in every 100 case referral in Yakkum’s rehabilitation center, 30% among the handicapped people are Cerebral Pasti cases. Most of the cases came from the most frequent drought areas. In Karangmojo village, 40% of the disability are CP and has close relation with the status of nutrition of women. Karangmojo is a village where drought is one big problem. Root problem of the drought is because of geological characteristic and climatology. It expose to all areas and population. Poverty, lack of nutrition and consumerism increase the level of fragility. However, people have high social resilience but low technical resilience. The Current Resilience Focus: How could the nutrition status of pregnant mothers maintained during the drought to prevent the birth of handicapped children with CP. Unit Implementor: Yakkum Rehabilitation Center

FINDINGS

Based on data of assessment above, generally hazard in all areas are high in the term of frequency and medium in the term of magnitude. Level of vulnerability is exposed from medium to high. Fragility in all areas was tended to high and level of resilience is medium to high. Factors that attributed to the impact of climate change are existing violence against economic, social and cultural rights plus variability of climatology. Quality of mitigation and adaptation program were low in order of technical and structural, but it covered by how people are struggling to defend their living using the existing social system.

Hipotesis 1,2, 3, 5; were supported in all villages. Which mean, the magnitude and frequency of hazards are felt increased; the fragility of the people is also felt increased; the level of fragility is correlated with the availability of better life conditions; the level of resilience will

depend on the felt potential impact and awareness of Impact of CC; the resilience is correlated with traditional Survival Life adaptation and the level of external Intervention. Even though we had found the relevancy of impact of climate change to the local situation, but at the same time we also found dilemmas in campaigning the climate change. We saw that increasing awareness to enhance resilience, or creating skeptical plus over blaming of CC as the root of the problem and releasing the responsibility of the existing structural injustice problem; Enhancing the peoples self initiative, or creating new project expectations of the people. Therefore we need to find a sufficient strategy to bring the message of global warming without eliminating local issue that concerned by people.

The people intervention to decrease the impact of CC to health is just started is focused to decrease the most killer disease for the most vulnerable groups. The climate change is considered not as a main cause but the supporting cause. Each Yakkum unit focus to one area for the vision of local transformation of climate change adaptation and mitigation. It is expected that all learning process will contribute many community based approach for brader transformation of CC.

CHALLENGE

Increasing concern on climate change issues is in fact tending to be the high level issues in developing countries. People, especially the poor, whom become the most vulnerable and the most impacted element in the society, are not receiving sufficient information and guidance on how to challenge the global warming. They life and living environment were in general impacted by CC and forced them to adapt with the new situation that was beyond of their knowledge and believe.

People's Protocol on Climate Change

- DECLARING that in order to address the climate crisis, the people must have real stewardship, access and control over the natural resources on which they depend rather than TNCs, international financial institutions or even governments. In so doing we assert people's sovereignty over natural resources
- Believe that the climate change crisis is not simply about adaptation and mitigation, but changing the whole economic framework into one of human rights, eco-sufficiency and sustainability.
- There shall be a comprehensive review and the formulation of a new definition of existing adaptation and mitigation measures based on consultations with affected and vulnerable communities.
- The importance of grassroots education, organizing and mobilizations to promote and realize our alternative vision and program for social transformation is recognized as an important tool to achieve the rights of peoples in the context of climate change
- A program for research and development on community based, appropriate sustainable technologies including recycling methods, renewable energy and other alternatives to unsustainable means of production shall be pursued. as well as a comprehensive international policy framework for economic diversification

Questions that now needed to be raised are where are all programs on climate changes had gone to? What is the impact of US\$1.5 billion of NAPAs that been said were used to fund 385 projects in 38 LDCs? What happen also to US\$10-40 billion of World Bank that annually deliver to “climate-proof” investments in developing countries? What is wrong with US\$50 billion fund of Oxfam that annually used to fund the adaptation program? Same question also needed to be addressed to US\$ 200-210 billion for mitigation plus US\$ 49-171 billion of the UNFCCC secretariat that informed will be used to fund the adaptation by 2030? Last what German Gov and the Civil Society will do to anticipate the impact of climate change in poor countries?

Quoted from the draft of People Protocol on Climate change, that the only solution to challenge and to address the climate crisis, is that the people must have real stewardship, access and control over the natural resources on which they depend rather than TNCs, international financial institutions or even governments. In so-doing we assert people’s sovereignty over natural resources

RECOMMENDATION

Suggested Community Based Approach :

1. From Issue based to Problem based: Start with the existing problems of the people, without directly related campaigns on global warming issues.
2. People analysis using current problems (1) The traditional social justice analysis. And (2) CC Risk assessment : Hazard-Vulnerability- Resilience Approach. Combine the two analyses based on peoples perspective.
3. The vision is local transformation for community based CC resilience, for snowballing effects to widen the contexts.
4. The best entry point are food and health problems. CC is not a specific project design, but has to be mainstreamed in the holistic development approach.
5. Focus of the intervention are the most vulnerable people (in term of Health Impact), using functional and structural approach

Suggested Advocacy Agendas

1. Alternative global economy: Back to struggle for sustainable development through transformational development process with CC mainstreaming.
2. Aid Effectiveness: Implementation of Paris Declaration and Ghana Action Plan --- Focus more on Community based CC transformation, more than global disclouse Talks.
3. MGD and Global Health Policy : Revision of the target achievement & double budget for achieving the goal.
4. Promoting and Advocating the Implementation of People’s Protocol on Climate Change.
5. **Establishment Global and National fund of CC related to Health:** Focus on Human impact
6. **Enhancing thre role of Stakeholders:**
 - Breton wood Institutions—Fair and community oriented carbon trading
 - UN Institutions—more inter coordination team for CC, a clearer strategy to manage the impact CC to human life

- National and Local Government—Long term plan of CC, in National development Plan
- Corporation carbon producer responsibility: Carbon cost Internalization and Carbon recovery Tax
- Civil Society capacity building: Micro/Lokal transformation on CC (CB Mitigation and adaptation)

Reported by:

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ⁱ To increase the health conditions of the Indonesian society, YAKKUM (Yayasan Kristen untuk Kesehatan Umum / Christian Foundation for Public Health), a church-based, non-profit organization, has established a comprehensive health care system, which consists of 12 Hospitals in central Java (one of them settled in south-Sumatra) with 1680 beds, various Maternity Houses and Poly – Clinics, Community Development Sub-Units, Rehabilitation Units for physical handicapped people, Emergency unit (YEU) , Pharmaceutical Factory and 2 Nursing and 1 Midwifery Education Institutions. The total number of permanent staff of Yakkum are 4200. Visit www.Yakkum.or.id. Or contact us wijayanta@yahoo.com