

LITERATURE REVIEW OF CLIMATE CHANGE IMPACT INDUCED MIGRATION

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ABSTRACT

Climate change impacts seem to be clearly over the world, especially, regions vulnerable to climate change and low resilience capacity. Climate change induced migration have also presented in these areas. This paper is the first step of research on human displacement caused by impacts of climate change and reasons making the vulnerable people to move on as well as where migrants resettle. The result of this review shows clearly that climate change is happening in Ho Chi Minh city and people who live in low-lying areas over the world are displacing by their environmental change causing by dreadful weather or climate. The paper used traditional methods to collect and classify materials related to the topic. The research suggests that people will displace because of their likelihood affected by climate change, besides, the review is basic for the author to carry out impact of climate change on Saigonist migration in the future.

Keywords: *Environmental change, climate change, human migration, impact.*

1. Introduction

Climate change has been clearly, particularly, temperature increase, changes in ocean and precipitation patterns as well as cryosphere (IPCC, 2013, AR5). According to this report, the global mean surface temperature is forecasted increase from 0.3 °C to 0.7 °C for the period 2016 – 2035 relative to 1986 – 2005. In some next decades, change in the water cycle will appear in near-term and this change will strongly be influenced at regional scale and the similar to ocean, the strongest ocean warming is anticipated for the surface in tropical and Northern Hemisphere subtropical regions, and especially, global glacier volume will also further decrease. Besides, “Asia is also arguably among the regions of the world most vulnerable to climate change. Climate change and climatic variability have and will continue to cause effect on all sectors, from national and economic security to human health, food production, infrastructure, water availability and ecosystems” (WWF, 2010). Furthermore,

migration to response to environmental stress is happening (Joarder M., Abdul M., 2013); (Mortreux C., Barnett J., 2009). Besides, climate change is also estimated to cause a forced migrants with massive number rank from 25 million to 1 billion of people over the world by 2050 (IOM, 2009).

With the above prospect, climate change has influenced on developing countries and their mega-cities with not only high diversity of population but also low adaptive capacity (WB, 2010, a synthesis report). The report notes that Ho Chi Minh city is one of three megacities (besides Bangkok, and Manila), in Asian, heavily affected by climate change, in which the city is predicted to get from 54 % of inundated areas to 6 % with climate risks considered under the high emission scenario in 2050. Currently, 26 % of the population would be exposed to flooding by 1 in 30 year event and unfortunately, by 2050, a half of the population is anticipated to be at risk from flooding during extreme event. Climate change is anticipated to cause to increase in frequency

of extreme events, and flood-prone area as well as population exposed to flooding, this will cost from 2 % to 6 % of the regional GDP. Being ranked the eighth high exposure to climate change with tropical storm, sea level rise and flooding and drought, Ho Chi Minh city is projected that with 1m of sea-level rise, 2,500 km² of mangroves will be completely lost and 1,000 km² of cultivated farm land and sea product culturing area will become salt marshes (WWF, 2010). By 2025, 160 km² or 32 % of the current 500 km² of residential and industrial built-up land is exposed to flooding following a 150cm event above current mean sea-level (Storch, H., Downes, N., 2011). Nine of twenty four districts of Ho Chi Minh city is anticipated to be affected by flooding, even citizens living at these districts may be displaced for safe (Nguyen, K. P. 2012). Any displacement will also cause a change in demographic and many other issues (Reuveny, R., 2007); Adamo, B S., 2010). Humanity displacement impacts on receiving regions, particularly, the ability of local governments in urban areas to provide sanitation infrastructure or other human services, besides variety of factors, including public health, security, labor markets, and natural resource bases (Licker R. and Oppenheimer M., 2012). Therefore, the displacement is a necessary and crucial problem in making development policies. However, why people will move? Which motivation make them displace? According to a research report by The Care International organization in Vietnam, there are list of elements impacting on human migration, they are including: i/. Low income; ii/. Jobless; iii/. Without happiness in work; iv/. Better work opportunities in urban areas; v/. Lack of opportunities to study at universities; vi/. Floods; vii/. Lack of cropland, and the two last reasons are considered as a consequence of climate change.

This paper only focus on displacement of humanity having to move by climate change. The overall objective of this research is to understand clearly how climate change impacts on out-migration in areas suffering from climate change and the displacement will cause what problems to receiving regions. The

research outputs contribute to the next research on climate change induced migration in Ho Chi Minh city in the future.

2. Methodology

This paper uses some of traditional methodologies aiming to seek and collect materials as well as information from papers published in both international professional magazines and international conferences, even reports of international organizations related to climate change and migration such as the IOM (International Organization for Migration), the CareInternational, the Save the Children, the ISET (The Institute for Social and Environmental Transition), the UNDP (United Nations Development Program)... list of the information from these documents has selected to rewrite as well as cite in this paper with reference. The papers from the international academic magazines have been firstly priority to read and cite then the special and annual reports of The IOM and the above organization have also referenced. There are few online papers which have been read and supported to the paper.

Firstly, we read all articles and magazines and reports collected and highlighted all important papers related to our topic, then we compared together the selected information and noticed time when the paper had published, it is certainly that the latest publication is preferred. Besides, we have also classified the hold documents into three kind of documents to help read and collect information easily, the classified documents are reports; firstly, the reports are related to both impact of climate change from the IPCC (Intergovernmental Panel on Climate Change), especially the fifth assessment report (AR5) and humanity migration caused by environmental change as well as climate change, importantly the report of The IOM: "Migration, climate change and environment" released in 2009, information of migration impact on receiving regions have been read and cited from a list of research published on journals, instantly a journal the Global Environmental Change ; secondly, papers and articles as well as research on climate change

impact on Ho Chi Minh city, they are the reports of the World Wide Foundation (WWF), of The World Bank (WB), Nguyen Ky Phung,.. we have also found the materials related to climate change induced migration in Vietnam, majority of found materials are research reports carried out in Mekong Delta River by the CareInternational Organization, Save The Children and the ISET.

3. Climate change induced migration

People maybe move due to many factors impacting on them, there are two kinds of migration. Particularly, network forces affect the move from location A to location B, push forces operate in A and push people to leave A, and pull forces operate in B and attract people to B (Reuveny, R., 2007). This paper concentrates on migration caused by climate change it means that migrants are forced to leave A. Fortunately, there are some authors giving terms and concepts such as environmental or climate change migration, environmentally induced or forced migration, environmental refugees and climate change refugees (Warner, K., 2010); Werz, M., Conley, L., 2012). In 1985, The U.N. Environmental Program gave firstly the concept of climate change refugees as follows: "Those people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardized their existence and/or seriously affected the quality of their life. By 'environmental disruption' in this definition is meant any physical, chemical, and/or biological changes in the ecosystem (or resource base) that render it, temporarily or permanently, unsuitable to support human life.". However, almost authors use a concept given by IOM, 2007: "Environmental migrants are persons or groups of persons who, predominantly for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their homes or choose to do so, either temporarily or permanently, and who move either within their country or abroad." (The 94th IOM Council,

2007). Basically, this definition is also used in this study.

In term of characteristic of environmentally induced migration, there are two research found Joarder, M. A. M, and Miller, W. M., (2013) and Fielding, J.A, (2011). Decision of out migrants to settle or to temporarily displace depends greatly on assistance after environmental disaster in case study of Bangladesh. In particular, Joarder and *at all* shows situations where the migrant has lost assets or became insecure following the environmental event were associated with a greater propensity to move permanently, whereas the loss of livestock and crops were associated with a greater propensity to move temporarily. In cases where the migrants moved to have more agricultural land to cultivate, or because it was perceived to be easy to earn money using the common property land in the destination regions, the move was more likely to be permanent. Meanwhile, Fielding (2011) suggests that driver of migration, whether internal migration or international border, is effected by role of seven factors: (1) drought and famines; (2) Floods and landslides; (3) Cyclones, windstorms, and waves; (4) a rise in temperature and extreme temperature; (5) rising sea level; (6) altered conditions for the spread of disease; and (7) indirect role of environmental change (through social conflict), in case study of United Kingdom. The study also notes that climate change will result in greater urban flooding, where unabsorbed run-off from heavy rainfall will exceed the capacity of urban sewerage and drainage systems to cope with, leading to a fourfold increase in the number of people at high-risk.

A piece of research finds that migration is considered as an adaptation strategy, (IOM, 2009; (Mortreux, C., Barnett, J., 2009). Particularly, according to Mortreux, C., and Barnett, J., [4], the research was carried out in 2007 by both observation made during three weeks and conduction a total of 40 semi-structured interviews, these authors gave a crucial result. In summary, due to this

research, climate change had have effect on a beautiful low-lying island, Funafuti (Tuvalu) with near 5000 people living in, which is anticipated to displace by inundation as a consequence of climate change impact if international community continue to fail in reduce of greenhouse gas emission. These considerable findings are the follow: firstly, the vast majority of those respondents wanted to stay at this island because they have a strong belief that Tuvalu was given by God and God will protect Tuvaluan people to response to climate change; secondly, 39% of Tuvalu population is under the age of 19, therefore, this group have not much enough experience in climate change to consider migration was their personal experience of environmental change, many respondents did not feel that climate change was an issue to be worried about on account of the fact that they themselves had not observed any environmental change; finally, elder people thought that they were native to Tuvalu and they would never leave despite what happens on account of the lifestyle, family connections, and culture, all of which seemed to be irrevocably tied to place. In term of officials, they described migration as the last option or environmental refugees. The study also notes that should cut greenhouse gas on a global level to slow the rate of climate change in order to enable Tuvaluans to adapt. Implicitly, knowledge and experience in climate change of vulnerable people is important for them to give displacement decision that is considered as a adaptation strategy. In contrast, IOM (2009) gives two examples of migration as an adaptation strategy in Colombia and in Guatemala. One of the example is The Colombian Temporary and Circular Labour Migration (TCLM) program that was carried out to help vulnerable population (who are at environmental risks that are exacerbated by a high poverty rate and a range of conflict- and crime-related challenges) cope with natural disasters and enable affected zones to recuperate. Similarly, 1 % of Guatemalans who had internationally migrated as a result of natural disasters provide major support for natural hazard affected populations in their

country of origin. The report of IOM also suggests that “migration can be a choice and to prevent forced migration” and gives a migration management cycle with five sections: (1) in areas prone to natural disasters it is important to reduce unmanaged migration pressure, preventing forced migration while also ensuring that migration that takes place is managed; (2) investment in prevention measures, it should be prepared for in order to minimize human suffering and the loss of livelihoods; (3) when displacement occurs, it is important to intervene quickly and decisively to manage it and address urgent humanitarian needs; (4) tackling impact of migration on communities of destination; (5) if forced migration occurs, it is need to be considered whether sustainable return or relocation. Briefly, the case study in Guatemala indicates that when migration happens, authorities should have migration management plan, including that migrants should receive education about both the culture and of economic development of destination areas.

Impacts of migration are both beneficial and harmful on destination areas (Licker, R., Oppenheimer, M., 2012). Licker and Oppenheimer also point out that migration impacts on receiving regions include: (1) public health; (2) security; (3) land use and natural resource; (4) labour market and economic. The study indicates that future research should consider the contexts in which climate induced migration is most likely to occur. However, according to a research of Reuveny, R., (2007) climate change induced migration leads to conflicts via four following channels: i/. competition between residents in receiving areas and migrants to excess demand for resources that leads to increase in risk of conflict; ii/.ethnic tension: if migrants and the host belong to different ethnic groups, the migration may promote tension; iii/.distrust: migration may generate distrust between the area of the receiving country accepts migrants in order to upset the ethnic balance in the origin; iv/. Fault lines: the conflict may also follow existing socioeconomic fault lines. For example, migrant and resident farmers may

compete over land, or migrants and residents may compete. He also suggests that least developed countries will experience more climate change-induced migration and conflict than developed countries. Meanwhile, Adamo, B S., (2010) finds that cities are increasingly exposed to the impacts of global environmental change events, which can trigger environmental migration to other regions, besides, cities are the most common destinations of migration inflows, and environmental change outside of cities can make the influx of migrants to cities. From this research, perhaps, cities will suffer double pressures from both internal migration inflows by climate change and migrants coming from rural areas.

In Vietnam, research on climate change and migration concentrates on Mekong Delta where is considerably affected by climate change, including floods, presented at a workshop on climate change and migration in the Mekong Delta organized by IOM, UNDP, and CTU (Can Tho University) in June 2012. There are much important information contributing to this workshop, instantly, the Delta has the lowest in-migration rate and the highest out-migration in Vietnam and non-agricultural labour demand from Ho Chi Minh city and the southeast create strong pull factors migrants from the Mekong Delta (Le, T. S., The Southern Institute of Sustainable Development). More detail, Nguyen, C. T., (the CARE International organization), noted that landless households were vulnerable to impacts of rainfall variability and that selling labour was one of the main coping strategies. Furthermore, Nguyen, C. T., also found that migration ranked fifth in the list of confronting strategies of households, with flooding and the lack of farming land identified as important factors in migration decisions. Other research of Chun (2012) shows that in rural areas (Dong Thap, Long An) displacement caused by rain variability, wind, and storm and migration as a result of lack of jobs, seasonal employment, and low wages, Chun notes that Ho Chi Minh and Can Tho are receiving regions due to higher income, perceived availability of jobs, year-round work which is less labour-intensive, and better infrastructure

and services. Chun's preliminary findings concluded that climate change is one of multiple drivers of migration and climate change has indirect impacts on migration decisions, in the form of implications on livelihood security. The workshop findings identify that migration is considered as an adaptation strategy for the poor and vulnerable population to climate change to diversity their income in response to the livelihood stressors. The workshop also demonstrated that Ho Chi Minh city was one of destination selected by migrants due to opportunities for jobs and increase in livelihood. Hence, in the future Ho Chi Minh city will copy with more challenges from temporary and permanent migration.

In term of future climate scenarios, instantly, climate change is projected to impact on all sectors of Ho Chi Minh and Binh Chanh, Can Gio district, and district 12 will anticipated to be the most inundation (Nguyen, K. P., 2012) ;. Recently, the Vietnam Climate Adaptation PartnerShip –VCAPS, 2013 indicates that climate change impacts being threaten HCMC include:1/. Rise in temperature, leading to higher temperatures in the city (heat island effect) and deterioration of air and water quality; 2/. Sea level rise, leading to increased flood risks and salt salt intrusion; 3/. Change in precipitation, leading to increased nuisance from extreme precipitation events; 4/. Change in river runoff, leading to an increase in flooding frequency. Besides the climate change impacts, also land subsidence resulting from over extraction of groundwater will lead to increased flood risks. However, no research on climate change induced migration in Ho Chi Minh has been found.

In summary, climate change have being happened on the global and low-lying areas, including Ho Chi Minh city that firstly suffer from adverse effects. Migration will increase risk of conflict in receiving areas regardless any kind of migration, including climate change induced migration. In Vietnam, there has been migration caused by floods that implicates on livelihoods in Mekong Delta. Most importantly, knowledge of climate change plays a crucial role in decision of

migration considered as adaptation strategy. From this review suggests that, firstly, raising knowledge of climate change impact and future climate scenarios for residents is really important because of their migration decision made by this raised knowledge. Secondly, authorities, policy makers should give strategies to manage their cities in copy with migration challenges, including climate change induced migration. Therefore, this review contributes to carry out the coming research on climate change induced migration to develop policies both confronting with climate change impact and supporting for forced migrants in successful migration outcomes in Ho Chi Minh City.

4. Conclusion

This paper is the first step research on

environmental change induced migration. The result of review paper finds ranges of clear evidences of climate change predicted to be more both complex and serious in the future. The review also gives proof showing impact of climate change on humanity over low-lying regions the world, particularly on human displacement that is chosen as whether a voluntary adaptation solution or forced migration due to environmental change caused by horrible consequence of dreadful weather. The review result is fundamental for the author to pursue continuing research on impact of climate change on migration in Ho Chi Minh city in the future when these impacts are anticipated to become more considerable and the result of the continuing research will also contribute to issue crucial policies of urban planning in complex of Ho Chi Minh.

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