

# Climate Change And Poverty – A Case Study Of China

## Summary

Climate change is set to exacerbate poverty both directly and indirectly. Extreme weather events can cause direct damage to agriculture, people's property, lives, livelihoods and infrastructure. The frequency of climate-related disasters has been increasing and their amplitude growing. Not only can they have grave consequences for productivity when they occur, but there may be serious repercussions for post-disaster reconstruction and resilience of the natural environment and infrastructure. Indirectly, there can be long term effects on economic growth and social development.. Developing countries and their people are the most vulnerable to the dangers of climate change. Their agriculture and way of life are more dependent on natural precipitation and their resilience to fluctuations in water resources and natural disasters more fragile. The strength of their financial resources, technology and systems necessary for adapting to climate change are also relatively weak.

In China, poverty-stricken areas have a strong correlation to ecologically fragile areas and their geographical distribution is equally very similar. From LI Zhou's research (1997), 74 percent of those living in sensitive ecological areas are in impoverished counties, accounting for roughly 81% of the total population in impoverished counties. According to statistics from the Ministry of Environmental Protection, 95 percent of the people living in absolute poverty are living in ecologically damaged areas in the interior of the country. The percentage of people living in poverty affected by climate change is expected to grow. Ecologically-vulnerable areas are mostly located along the borders of ecological zones. Interactions of various elements, especially people's exploitation of natural resources, lead to the instability of ecosystems and the worsening of ecological and environmental conditions.

Ecologically fragile areas in China are now showing clear signs of climate change: glacial retreat; intensification of droughts; forest and vegetation atrophy; enhanced soil erosion; frequent extreme weather events and intensified disasters; sea-level rise and accelerated coastal erosion. As a result, the natural condition of impoverished areas is extremely vulnerable to climate change; and with more frequent droughts, floods and other extreme weather events, the impact is becoming even greater. Climate change can severely affect all spheres of life in poor areas. The majority of poverty-stricken areas are remote, located far from economic centres and without good transportation links. Furthermore, a lack of resources and infrastructure and a water shortage, combined with rapid population growth and low standards of basic social services such as health and education mean that their ability to cope with disasters is limited.

Against the backdrop of global warming, China's surface air temperature will continue to rise, with northern areas set to experience a greater increase than those in the south. Comparing with 1961~1990, by 2020, China's average annual temperature will have

increased by between 1.1°C~1.2°C while precipitation will have increased by between 2%~3%; by 2050 these figures will be 2.3°C~3.3°C and 5%~7% respectively. Precipitation variability will increase, and extreme weather events intensify. Extreme cold spells will begin to decline in China, whilst extreme hot weather will increase. Droughts in northern China and floods in southern China will all be exacerbated. Regional variations show that the north-eastern, northern and north-western parts of China will experience hotter and drier summers, displaying clear signs of aridification. Central, eastern and southern China on the other hand will experience markedly wetter summers but drier winters. Drier winters will be especially noticeable in southern China where summer floods and winter droughts will occur alternately. If adaptive measures are not taken, climate change will adversely affect China in a number of ways:

1) Agriculture. Agricultural productivity will decrease. Diseases, pests and weeds will affect wider areas. Pest-infestation periods will be longer, causing serious damage to crops.

2) Water Resources. The distribution of water resources will change. With higher temperatures, evaporation will increase and most regions will experience a shortage of agricultural water resources. Glaciers will shrink. Climate change will bring about the degradation of north China's grasslands, a reduction of biodiversity and a decrease in grass production and livestock capacity. Climate change will do nothing to alleviate north-west China's water shortage either. On the contrary, it will decrease even further the per capita river runoff of provinces like Ningxia, Gansu, Qinghai and Xinjiang by between 20%~40%. In coastal regions, a greater impact of tropical storms, an accelerated sea-level rise, a decreasing sand flux from river to sea and exacerbated coastal erosion will all be inevitable.

3) Health. Climate change could endanger human health by increasing outbreaks of disease and their transmission. After floods, for example, infectious diseases such as diarrhoea, cholera, dysentery and typhoid are all far more prevalent.

These effects would exacerbate the degradation of the ecologically fragile areas in which poor communities are concentrated, which would mean huge losses for those communities and make poverty-challenges is finding a way of adapting to climate change while still alleviating poverty.

This report explores, through climate data analysis and literature review, how climate change impacts on poverty. Poverty-stricken counties representative of three areas typical of how climate change can affect poverty were selected as case studies: a drought affected region in northwest China, an area with storm-induced mudslides in southwest China, and an area where droughts and floods have intensified in south China. The report presents a detailed analysis of climate change trends, their impact, and suggests measures of how best to cope with them.

Yongjing County in northwest China is a typical arid region where agriculture is carried out in function with an inherent lack of water. Since the mid 1980s, because of global

warming, annual rainfall has dropped and droughts have become markedly more frequent. This has led to an increased threat to agricultural productivity and consequent hardship for local residents.

Mabian Yi Autonomous County, located in the Xiaoliangshan region on the southwest border of the Sichuan basin in southwest China, was selected as a case study for its complex geological structure, illustrating the close association between climatic conditions and mudslides. Because of global warming, total rainfall has dropped, while its intensity has increased. Flash floods and hillside disasters have noticeably increased, bringing massive economic losses to the area. The whole county's economic development has felt the impact of rising disaster-related costs, which have become the main cause for certain groups becoming trapped by long-term recurring poverty.

Yangshan County, located in the northwest of Guangdong province in south China, is in a mountainous limestone area. Due to its fragile economy, it was classed as a county requiring state assistance and an 'extremely poor county' of Guangdong Province as part of the State Seven-Year Priority Poverty Alleviation Program. Because of climate change, both temperatures and variability of precipitation have increased, with droughts and floods happening alternately in increased frequency and intensity, heavily impacting on agricultural production. From 2006 to 2008, Yangshan County was continuously hit by typhoons, floods, droughts, freezing rain and snowstorms that resulted in major losses for local residents. These not only make the escape from poverty more difficult but can also force some others, who had been lifted out of poverty, back into it.

Current poverty alleviation policies implemented in impoverished areas include poverty reduction through industrial production, the integrated village development plan and voluntary resettlement (such as the ecological migration and labour export training in Diao Zhuang). However, existing poverty alleviation policies are yet to consider the impact of climate change sufficiently. This is demonstrated in the following areas: Firstly, more flexible measures are necessary to deal with the increased variability of the natural environment that has arisen from climate change. Secondly, blind pursuit of economic growth in some areas has often badly affected the environment, further exacerbating poverty. This is especially true in the case of a reliance on groundwater exploitation for economic growth in arid regions, which is not only unsustainable but can even worsen the region's climate crisis. Thirdly, environmental degradation, drought and increased disaster risk and incidence mean that, in the future, we will have to deal with more and more people falling back into poverty. Fourthly, climate change affects different areas in different ways. Well-targeted poverty alleviation policy should be realistic and established in light of locally available resources. The new challenges set by climate change on existing poverty alleviation policy make poverty reduction more and more difficult.

This report gives the following recommendations on poverty alleviation policy in impoverished areas:

1. Review existing poverty alleviation policy in light of climate change and adjust them according to the specific manifestations of climate change in ecologically fragile areas;
2. Build the resilience of poor communities to climate-related natural disasters;
3. Make climate change adaptation a priority in international negotiations;
4. Accelerate the drafting of relevant laws and regulations;
5. Pay stricter attention to environmental issues in the process of poverty alleviation;
6. Moderate uncontrolled development and continue to promote the improvement of poor infrastructure.

Regarding funding, the report recommends more investment in poverty alleviation and research on climate change adaptation, and the establishment of a special fund for climate change adaptation. The report also recommends involving the public in the adoption of measures such as taking precautions against natural disasters, improving early-warning technology and disaster relief mechanisms, optimising industrial structure and improving the capacity of exported labour from poor areas.

Transdisciplinary studies concerning the impact of climate change on the poor are only in their early stages in China and thus remain limited. In order to enhance the strength of future relevant research, more indepth fieldwork should be carried out at the community level.