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## **Climate Change and Food Supply: Reinforcing the North-South Divide**

*By Goh Tian and Jonatan A. Lassa*

### **Synopsis**

*Climate change is set to shift food production centres and change the power dynamics of food supply and demand. Notwithstanding the general foreboding of doom and gloom from climate change, are there likely benefits from global warming?*

### **Commentary**

WHILE THE common narrative of the impact of climate change paints a global doomsday scenario, the real repercussion on food security varies. Some positive effects of climate change include the possibility that a warmer climate will open up new areas for farming in the North and the South, in terms of latitude, for farmers.

The unequal impact of climate change on food security is all too evident. Countries located in the tropics will bear the brunt of climate change while countries in the developed North are likely to benefit from it. The negative climate impact on food production from heat stress and erratic precipitation patterns resulting in drought or flooding, is likely to reduce yields in Southeast Asia.

### **Impact of climate change on food production**

However, favourable conditions do not necessarily translate into production improvements in all these countries. Those who will benefit will be countries and corporations that can exploit the potential benefits from a changing climate. The real impact of climate change on food security is thus the shifting of food production centres and the potential changes in power dynamics, not only between exporters and importers, but also between small and large producers.

Under a modest emissions scenario, climate change is likely to open up new areas for farming further to the north of Canada and Russia, and further to the south of Argentina. Some crops in the northern parts of the United States will also benefit from warming. Highlands in the tropics may become suitable for growing some crops and vegetables.

In the fisheries sector, some experts have estimated that under modest to high emissions scenarios, fish catch potential may be altered as marine fishes tend to migrate further to higher latitudes in the

North. Norway, Sweden and some Western African states are likely to double or triple their fish catch potential.

While climate change will favour food production in some developed countries and reduce food production in the lowland tropics, where many developing countries are located, inequality in food production will be exacerbated by the lack of access to technology – the means required to reap the benefits of climate change or to reduce the impact of climate change.

Both scientific and anecdotal information suggest the possibility of increasing uncertainty in crop and fisheries production. Some studies, including anecdotal studies, have projected that tropical seaways such as those in Indonesia and the Philippines may be hit hard by warming and ocean acidification which can cause fish to migrate to deeper waters and regions of higher latitude.

Other studies point to the possibility of increase in frequencies and intensities of storms in Southeast Asia, especially in the waters surrounding the Philippines and Indonesia. Indonesian fishermen have recently experienced an increase in fishing time loss due to higher incidence of strong stormy days. In fact, more intense storms and stronger waves will prevent fishermen from heading out to sea, potentially reducing fish supplies and the much needed income that families of fishermen depend on.

Large fishing companies and countries with better fishing equipment and satellite technology for locating potential fish catch regions will benefit from fishing effectiveness and greater yields. Consequently, small and traditional fishermen with small boats will be at risk as they have limited technology to detect fish stocks and often cannot fish in deeper seaways, where fish have migrated to.

### **Crops at mercy of climate**

A similar story unfolds for crop production. Most studies agree that the tropics will be less suitable for the cultivation of maize and wheat while the northern region of North America may see yield gains. 'First movers' in the food industry that are able to identify and move into emerging regions will be able to gain control over new agricultural lands, capture export markets, utilise technology to maintain high yields of crops and ensure efficient land use and water management.

For example, corporations have already begun to move further North into Canada. Some 162,000 hectares of maize were harvested in 2013 in Canada, double the amount in the previous two years. The area for maize production is expected to increase in the Canadian Prairies as growing seasons have increased by two weeks over the last 50 years and temperatures are expected to continue increasing, favouring maize cultivation.

With low adaptive capacities, limited research into agriculture, livestock and fisheries, and limited knowledge of the potential extent and form of climate impact, Southeast Asia, with its vast population, can only watch and wait.

### **Policies may be counter-productive**

Policies and responses that do not consider eco-systems and biodiversity may be counter-productive. For example, the opening up of tropical highlands for agriculture needs to be matched with adequate land-use management, to prevent sedimentation in coastal areas which could destroy habitats required for the reproduction of wild fish and areas for aquaculture farming.

The rapid expansion of aquaculture as an adaptation measure to make up for reduction in wild fish catch may also destroy coastal habitats which sustain wild fish population. In addition, lack of knowledge of the causes of decline in crop and vegetable yields could also push local farmers to engage in over-use of pesticides and fertilisers.

There is also an urgent need for the transfer of finance, knowledge and technology to level out the playing field. Experts agree that there is still a lack of understanding on how climate change will affect other commodities such as livestock and secondary crops.

The lack of knowledge and research into the form and extent of climate impact as well as the

interaction between different agricultural and ecological systems increases the chances of maladaptation. Without adequate recognition of the need for greater research and support for farmers and fishermen in the tropics, the power balance between North and South will only tilt further.

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