

# Strategic Analysis Paper

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## Climate Change Adaptation Strategies for Indonesia

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### Key Points

- Climate adaptations can be made on both a small-scale, in local communities, and at the national level.
- Infrastructure robustness and resilience is imperative in climate change adaptation for both flood and drought prevention.
- Efforts must be made to ensure food and water security during floods or drought. Water storage facilities will help to alleviate both flood and drought events.
- The importance of emissions reduction must not be forgotten in the rush to create adaptation strategies. Greenhouse gas abatement is one of the most important measures to take.

### Summary

Climate change adaptation in Indonesia will in large part focus on flood and drought prevention, and food and water security in relation to this. Some of the adaptation strategies that will be of most benefit to Indonesia include infrastructure reinforcement to gain resilience and robustness when faced with floods or droughts, the establishment of early warning systems, sustainable and adaptive farming practices and disaster insurance. Another important strategy is climate change prevention, focussing on the importance of reducing emissions, and thus reducing the severity of climate change in the future. This paper will suggest adaptation measures that can be taken by the Indonesian Government and the Indonesian people to prepare for a changing climate.

## Analysis

As discussed in the previous *Strategic Analysis Paper*, the increased risk of floods and droughts are the main climate change threats faced by Indonesia. Adaptation measures and strategies will need to be implemented to minimise damage and losses. An important part of climate change adaptation is to mitigate emissions as early as possible, to minimise the expenses of reducing emissions later, and the severity of their consequences.

It is important to recognise that there is a variety of climate change adaptation strategies, some of which are better suited to Indonesia than others. Successful adaptation strategies are built upon the implementation of a variety of measures that complement each other and are flexible enough to be maintained or replaced over time.

Floods and drought are the main problems that Indonesia will face as climate change progresses. With a vast population spread out over six thousand islands there are a lot of logistical problems associated with the implementation of nation-wide strategies. Adaptations that can be designed and implemented on smaller scales and in local communities will be particularly valuable. Making preventative measures for food and water security in the face of floods and drought is critical.

In coastal areas, which are more flood-prone, adaptations such as building and maintaining embankments can be quite helpful, as well as digging trenches to lead the water away from populated areas. The establishment of early weather warning systems will help communities make these preparations. People can also [flood-proof their homes](#) by building them up, having second storeys, or making barriers in front of their doors to prevent water from entering.

On larger scales there is a need for reinforced infrastructure, particularly in larger cities. Clean and well-kept canals are vital for keeping water out of the streets. Widening existing canals, and constructing new ones to make sure they have the capacity to deal with the magnitude of the projected floods in coming decades, will be vital. These infrastructure adaptations are costly, but will ultimately reduce the cost of future damage.

In cities experiencing a lot of urban expansion, taking geographical conditions into closer account will help ensure that expansion takes place in areas that are well protected. Both for current development, and more importantly for larger future expansion projects, it is important to keep in mind what areas are particularly prone to floods or drought, or if settlement in specific areas will increase the risks of floods and drought. Expansion that requires a lot of deforestation could lead to such increased risks. Settlements that are located near riverbanks or close to the coast could come under [increased threat in as little as thirty years' time](#), as sea level rise or increased precipitation could come to flood the area more frequently. Planning for these future changes will help to ensure the reduction of climate-related risk.

Both floods and droughts require reliable and robust infrastructure. Access to well-stocked food and water storage facilities is imperative in times of natural disaster. Both floods and droughts can lead to water scarcity and the destruction of food crops. Having storage

prepared and maintained for climate events, particularly in densely populated areas, is a big part of building climate change resilience.

An issue particularly related to droughts is the increased risk of fires. During droughts there is an elevated need for weather forecasting, assessing fire risks and implementing monitoring strategies. Infrastructure managers in areas that experience frequent droughts should [consider increased investment in fireproof buildings](#), particularly those that serve critical emergency response functions, and have action and evacuation plans prepared in the event of a fire.

Growing food in areas prone to more frequent floods and droughts can be challenging, but there are measures that can be taken to adapt to those climatic conditions. Efficient irrigation systems for dry areas, or trenches for flood run-off in wet areas, can be helpful. Crop rotation is often used to maximise crop quality as well as field terracing. Increased investment in crops that are more resilient to drought or higher salt levels in the soil could help Indonesian farmers adapt to climate change.

As one of the worlds' top greenhouse gas emitters, Indonesia finds itself in a unique position. By reducing its emissions Indonesia could make a noticeable contribution to the reduction of global emissions. Deforestation in Indonesia alone is responsible for [6-8% of the world's total emissions](#). Restricting deforestation and strengthening environmental policies, such as the moratorium on deforestation, is possibly the single-most important preventative measure Indonesia can make at the moment. There is currently a moratorium on deforestation in Indonesia but, without stringent enforcement mechanisms, deforestation has not significantly declined since it was introduced four years ago. By enforcing the moratorium, and including other carbon sinks – such as peatlands and mangroves – in the moratorium as well, the country's emissions might be reduced by [thirty per cent](#) over the next fifteen years.

## **Conclusion**

There are a multitude of adaptation strategies that can be implemented in Indonesia. The measures described in this paper are merely some of the measures that can be taken to prepare and adapt to a changed environment. Just as the effects of climate change are not likely to be uniform globally, each country will face its own climate challenge. Adaptation strategies will need to be evaluated according to each country's specific needs and situation. Taking advice from countries facing similar problems and learning from each other can be very helpful in finding the adaptations that best fit each country. There is no one-size-fits-all adaptation strategy, and Indonesia is likely to require the implementation of several of these strategies if it is to successfully avoid the most severe challenges associated with climate change. It is important to keep in mind that once an adaptation has been implemented it must be followed up, and maintained to remain functioning. Reducing carbon emissions must remain a top priority, and for Indonesia this means rapid reduction in deforestation. Current practices must change to prevent worse outcomes in the future.

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