

*Note: As part of their contributions to the RECLAIM POWER global days of action in October 2016 for energy transformation, several Reclaim Power organizations collaborated on these series of briefing papers on dirty, harmful energy sources and false energy solutions that contribute to climate change and endanger people's lives and welfare.*

## RESIST DIRTY HARMFUL ENERGY AND FALSE ENERGY SOLUTIONS

# MEGADAMS

### What are megadams?

Megadams are, as the name suggests, huge dams that block off major waterways to produce hydropower, which connect easily to electricity grids. "Large" megadams are considered to be at least 15 metres tall and with a reservoir capacity of at least 3 million cubic metres.<sup>1</sup>

Following a decade-long lull in hydroprojects, there has been a major resurgence in dam construction worldwide as international financial institutions like the World Bank, as well as financial institutions from middle-income countries like China, pour new investments into projects around the world. This resurgence is in part because megadams are hailed as a "clean energy solution"- and the myriad environmental public concerns of human rights and environmental damage are overlooked.

### What is the present state of the construction and operation of megadams in the world today?

Established links between fossil fuel use and global climate change – and the volatility in the price of oil – has led to the increase of hydropower production, especially in developing countries. In 1973, electricity generated from hydropower totalled to 1,296 terrawatt-hour (TWh). It increased by almost 300%, to 3,874 TWh in 2013<sup>2</sup>.

Yet, in the same period, its share in the total energy mix dropped globally due to the dependence on fossil fuels by developed Western economies. Its fuel share in the global energy mix for electricity generation dropped



from 20.9% in 1973 to 16.3% in 2013. In 1973, OECD countries accounted for 71.8% of global hydropower, which dropped to 38% in 2014<sup>3</sup>.

The increase in hydropower use, however, is marked in developing countries. From 1973 to 2014, China increased its share in the global electricity generation from hydropower; from 2.9% to 23.8%. The rest of Asia in the same period also rose from 4.3% to 8.5%. Non-OECD America expanded from 6.8% to 17.6%, and Africa from 2.3% to 3.1%<sup>4</sup>.

### Why should we oppose megadams?

Megadams exacerbate global warming, harms rivers and ecosystems, and, destroys communities and livelihoods.

**Megadams and climate change.** Hydropower is referred to as "green energy" but water reservoirs created by megadams are a significant source of

<sup>1</sup> <http://www.worldwatch.org/node/6344>

<sup>2</sup> 2015 Key World Energy Statistics, International Energy Agency (IEA)

<sup>3</sup> *ibid*

<sup>4</sup> *ibid*

methane and CO2 due to decomposing vegetation, road building and habitat destruction. Globally, reservoirs are responsible for about 1.3% of world man-made greenhouse gas emissions each year – or about the same as Canada’s annual total emissions<sup>5</sup>. In addition, large dams consume huge quantities of steel and cement, which are highly CO2 -intensive to produce.

**Megadams harm rivers and ecosystems.** Megadams pose threats to healthy rivers that provide drinking water and water for agriculture. Rivers filter out pollutants, mitigate flooding and droughts, recharge groundwater supplies; they sustain fisheries and are important by-ways for travel. A river is more than just a body of water--it also has its beds and banks, groundwater, and surrounding forests, marshes, and floodplains. The environmental and human impacts of dams can be felt far downstream of the actual dam, and often in a different country or province.

The environmental impacts of megadams are numerous and varied.<sup>6</sup> The most significant include:

- Upstream, the river is transformed from a free-flowing ecosystem to a slack-water reservoir. The changes in temperature, chemical composition, dissolved oxygen levels, and physical properties of the waterway threaten indigenous plants and wildlife, and can breed non-native and invasive species that undermine the natural ecosystems;
- A dam affects a river’s flow and sediment transport, which in turn affects all lives that have evolved around the timing and quantities of riverflow. Even subtle changes can unbalance the fragile ecological web of a river system;

- Changing the sediments in a river increases downstream erosion. When sediments are lacking, the river’s chemical makeup is altered, and the water will try to compensate by eroding riverbeds and banks downstream, which rapidly erodes bridges and other riverbank structures and riverbed woodlands. Riverbeds located hundreds of kilometres downstream of dams are typically eroded by several metres in the decade following a dam construction;<sup>7</sup> and,
- Large dams have caused the extinction of fish and other aquatic species, huge losses of forests, wetlands, and farmlands, the erosion of coastal deltas. They have been a substantial cause of the extinction of 20% of all freshwater species and why many of the world’s freshwater fish stocks have collapsed<sup>8</sup>.

**Megadams destroy communities and livelihoods.**

Building dams often forces the eviction of local people. International Rivers estimates that 40 to 80 million people have been displaced by dams – approximately two million people are displaced each year. At least 500 million more suffer from the downstream impacts of dams:<sup>9</sup> loss of fisheries, decreased water quality and quantity, decline in farmland and forest fertility. Communities who are most impacted by megadam projects are marginalized groups--poor farmers and indigenous peoples. The majority of these people end up further impoverished. When displaced or affected people are compensated (many are not), they are rarely paid enough to compensate for their losses of land, homes, jobs, and livelihood. Electricity produced by these mega hydropower projects most often goes to large urban centres, industrial production, and the consumption of elite.



<sup>5</sup> <http://www.climatecentral.org/news/greenhouse-gases-reservoirs-fuel-climate-change-20745>

<sup>6</sup> <http://www.internationalrivers.org/environmental-impacts-of-dams>

<sup>7</sup> <http://www.internationalrivers.org/environmental-impacts-of-dams>

<sup>8</sup> [https://risingtidenorthamerica.org/wp-content/uploads/2014/11/FS-BOOKLETT\\_FINAL.pdf](https://risingtidenorthamerica.org/wp-content/uploads/2014/11/FS-BOOKLETT_FINAL.pdf)

<sup>9</sup> <http://www.internationalrivers.org/frequently-asked-questions>