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## Biofuels News

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### Biofuel crops could drain developing world dry

By Charlotte de Fraiture

Growing biofuels could put pressure on scarce water supplies in poorer countries, argues Charlotte de Fraiture.

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Biofuel production will increase demand for agricultural land at the expense of ecosystems. Perhaps more critically, it will also require large quantities of water - a major constraint to agriculture in many parts of the world. Pursuing biofuel production in short countries will put pressure on an already stretched resource and will turn green into a major threat to resources.

The recently completed Comprehensive Assessment of Water Management in Agriculture estimates that 1.2 billion people live in areas affected by water scarcity, where water resources are not enough to meet growing needs.

In many of them, people rely on irrigation for agriculture. In India, for example, more than 70 per cent of the cereal crops grown for food and feed production are irrigated - and in China the figure is more than 70 per cent.

Irrigation demands large amounts of water, depending on both crop type and region, a climate and mode of cultivation (high-input versus low-input agriculture).

For example, one kilogram of Indian rice evaporates an average 1100 litres of irrigation water, while one kilogram of wheat in China, by contrast, evaporates 820 litres.

Both China and India, responding to severe water shortages and growing water needs,

already initiated large projects to transfer water from areas of high to low abundance. South-North transfer project in China and the Linking of Rivers project in India are examples. But such projects are controversial because of the high costs, environmental and displacement of people associated with them.

### **Biofuels add to the strain**

In water-short countries, increasing agricultural production of biofuels will simply add strain on stressed water resources. Almost all of India's sugarcane - the country's major crop - is irrigated, as is about 45 per cent of China's top biofuel crop, maize.

The water needed to process crops into biofuel is negligible compared with the amounts to growing them. Research at the International Water Management Institute (IWMI) in Sri Lanka has shown that at a global average, the biomass needed to produce one litre of biofuel evaporates between 1000 and 4000 litres of water, depending on the type of feedstocks and conversion techniques used.

Sugarcane in Brazil evaporates around 2200 litres for every litre of ethanol. But in this rich region, the demand is easily met by abundant rainfall. In more arid countries, irrigation must make up the shortfall. In India, for example, a litre of sugarcane ethanol requires 22 litres of irrigation water.

### **More, more, more**

As populations grow over the next four decades, demand for food, and thus water, will rise across the world. This is especially true for rapidly developing nations like China and India, where people's improved standards of living will cause diets to shift towards more oil, vegetables, meat and dairy products, all of which typically require more water to produce.

Because of their limited water resources, such countries will face serious challenges to meet the predicted increase in demand for food production, let alone sustain any further growth by expanding biofuel production.

By 2030, India's demand for cereal is set to rise by 60 per cent, and more than double for oil. Analysis by the IWMI indicates that even under the most optimistic scenario, the demand for irrigation water will increase by 13 per cent - equivalent to 84,000 billion litres, or roughly the annual flow of the Krishna River.

Growing sugarcane to produce the 9 billion litres of bioethanol needed to meet just 10 per cent of India's petrol demand by 2030 could add another 22,000 billion litres of irrigation water. And this is assuming that water efficiency improves.

In China, cereal demand is expected to grow by 45 per cent, mainly to feed animals. The amount of irrigation water that will be needed to meet this is estimated at 73,000 billion litres, an increase of 14 per cent from current demand for cereal crops. Growing maize to produce enough ethanol to meet 9 per cent of China's predicted demand for gasoline by 2030 could add another 26,000 billion litres.

Parts of China and India have already breached the limits of sustainable water use, even without the added strain of trying to grow significant quantities of biofuels. Visible signs of the problem include rivers that are drying up, such as the Yellow River, which no longer reaches the sea during dry months; falling water tables in the North China Plain and in India's breadbasket.

region, the Punjab; and pollution and intense competition over water.

Unless other, less water-intensive, alternatives for feedstock are considered, biofuels environmentally sustainable. It is high time discussions of biofuel production put green into a blue context, and took water issues into account.

Charlotte de Fraiture is senior researcher and head of the Global Change and Environment at the International Water Management Institute in Sri Lanka.

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