



## Using diversified energy in agriculture can protect food security

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Energy price shocks—negative and positive—can have a powerful economic knock-on effect, especially on food prices where food is scarce. Even though great strides have been made since 1945 in feeding Asia’s huge populations, more than 500 million people still face food insecurity. Of the world’s undernourished, almost 65% live in Asia.

Food insecurity stems from the link between energy prices and food prices, among other causes.

A survey of Bangladesh, the People’s Republic of China, Indonesia, India, Japan, Sri Lanka, Thailand, and Viet Nam from 2010 to 2016 proposed a model with eight variables affecting agricultural food prices—land prices, GDP, inflation rates, oil prices, biofuel prices, employment in agriculture, labor costs, and real interest rates.

Farhad Taghizadeh-Hesary, one of the authors of ADBI’s research on this topic, sums up the survey’s findings:

**A significant association with food prices could not be found for some of these variables, but any sharp increase in the global oil price leads to a direct increase in agricultural prices. Results show that oil price fluctuation has a large share in food price volatilities—about 62%.**

Fossil fuels impact every stage of food production and are needed for irrigation, fertilizer, aquaculture, livestock, and forestry. Secondary production—drying, cooling and storage, and transport and distribution—uses fossil fuels, too.

In many Asian countries, agriculture contributes heavily to GDP, and developing countries’ GDP rates are much more vulnerable to oil price fluctuations than developed countries’. Without a strong industrial base, countries such as India, Pakistan, Thailand, and Viet Nam do not have the same ability to accommodate oil price volatility that, for example, the US and Japan have, and this can contribute to food insecurity.

Taghizadeh-Hesary says this about food prices and renewable energy:

Because oil price fluctuation has such a disproportionate effect on food prices, researchers advise developing diversified energy to hedge against the danger of food security. Although renewable sources alone can't support an entire economy, agriculture, which is based on given production cycles, can benefit from them. This will not only help improve energy and food security but also protect the environment.

Renewable energy can be used directly by the end users in the food production chain or indirectly when renewable energy is integrated with conventional energy supply systems that are mainly based on fossil fuels.

This episode was based on [research](#) done for the Asian Development Bank Institute by Farhad Taghizadeh-Hesary, an assistant professor of economics at Waseda University, Tokyo; Ehsan Rasoulinezhad, an assistant professor of economics at the University of Tehran; and Naoyuki Yoshino, dean of ADBI.

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- <https://www.adb.org/publications/volatility-linkages-between-energy-and-food-prices-asian-countries>

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