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Advanced Biofuels USA is a 501(c)3 nonprofit organization. Its purpose is to promote public understanding, acceptance, and use of advanced biofuels; to promote research, development and improvement of production, marketing and delivery of advanced biofuels; and to improve advanced biofuels crops and products.

Advanced Biofuels USA Responds to Science Article

A study published in Science magazine promotes a policy which would penalize American biofuels industries in US legislation and regulation and in international global climate change agreements. Advanced Biofuels USA would like to point out two items which are not given adequate attention in this discussion: land use policies in countries around the world and the comparatively low value of advanced biofuels feedstocks.

Land Use Policies

We are concerned that attempts to improve international land use policies to achieve more conscientious land use management are aimed at US farmers, growers and biofuels producers who have no control over those policies or lands. These attempts should more appropriately be directed at the land owners/operators, growers, farmers and biofuels producers in each country which chooses to participate in this energy economy. The current greenhouse gas emissions accounting which is the subject of this Science article, recognizes that the responsibility for emissions related to land use currently belongs to the country in which the land is located and to the land's owners. The authors want to change that.

In effect, they want to force American individuals to "make up" for deficits resulting from other countries' policies and practices over which Americans have no control. Encouraging and incentivizing employment of low-carbon agricultural practices in this country to mitigate climate change effects is the responsibility of the people who work here and consume the products produced here. Similarly, we must rely on other countries' growers and policy makers to take responsibility for their pieces of the earth and the global effects of practices there.

Diplomatic pressures and international incentives should be focused directly on those who make the decisions about land use, those who have responsibility for agricultural, industrial and land use policies and practices-and those who consume their products.

Energy Crop Economics

Many people have the idea that energy crops are going to make growers rich. They believe that anyone who has a piece of land will drop all other uses of the land to grow energy crops. To the contrary, biofuels producers' business plans anticipate paying very low prices for feedstock. Their competition is land use sale for residential and commercial use (33 million acres of US agricultural land was transferred from production to development between 1982 and 2003- enough land to support fuel for half the vehicles in the US year after year), and use for food/feed crops and drug crops.

Current US policy calls for moving from first generation biofuels such as corn-based ethanol and soy-based diesel to advanced biofuels derived from agricultural and food processing waste, forest residues and energy crops such as perennial grasses, sorghum, bush poplar, etc., which have minimal or no participation in food pricing markets.

What's wrong with someone with marginal land that is not good for growing food/feed, but can grow grasses or other energy crops adequately, growing that crop and making enough income to buy food/feed and other goods that he/she cannot produce?

In the same vein, ecologically smart and sustainable forestry practices should be encouraged. Reports about the study focus on the possibility of forests being destroyed, wood chipped and burned and land "turned into parking lots."

To the contrary, first, it seems that the highest and best use of wood from mature forests is as furniture and building materials which will continue to sequester the carbon captured over the years by the trees. Popular reporting about the study agonizes that the wood will be burned in the open air, ignoring the possibility of specially designed power-generating facilities using efficient technologies with low carbon footprints.

Second, major carbon capture in forests takes place during the first 10-15 years. Mature forests capture less carbon on a yearly basis than a field of perennial grasses. Although in developed countries, forests are often destroyed for residential developments, shopping centers, office parks and parking lots, any land that changes use from forest to food, feed, fiber or energy crops will continue to harvest carbon from the atmosphere, perhaps even more than the forest did.

Count GHG Emissions of Petroleum Products, Too

An author of the study, Tim Searchinger, does well to mention that good accounting must also take into consideration greenhouse gas emissions from coal and oil, "The solution is to count all the pollution that comes out of tailpipes and smokestacks, whether from coal and oil or bioenergy, and to credit bioenergy only to the extent it really does reduce greenhouse gas emissions." Yet, popular coverage of the study focuses on placing responsibility for international land use policies and practices on those in the US engaged in trying to establish energy security by developing a bioenergy industry.

This focus is misplaced. Emissions from all sources of energy should be accounted for using scientifically respected and tested methods; energy policies should reflect those findings; and pressure should be placed on those who directly make policy and who can implement improved ecological practices where ever they are in the world.

The farmer in North Dakota is going to sell corn at the best price the market will bear, not asking if it is going to be used to feed hogs, contribute to obesity via soft drinks, make compostable cutlery and carry-out containers, or to be turned into ethanol to enhance the octane of gasoline or decrease our dependence on foreign oil. That grower will feed the market to the best of his or her ability to make the best profit possible. That takes plenty of skill, knowledge and work. Don't also burden that farmer with responsibility for ecologically destructive land use policies and practices in a country half way around the world.

The 7% Solution: Sustainable US Biofuels without International Indirect Land Use Effects

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(Advanced Biofuels USA) Looking at some real-world numbers, it becomes clear that the fear raised in *Fixing a Critical Climate Accounting Error*, Science, October 23, 2009, misses the point. Growing energy crops, including perennial grasses or energy trees, in the US for biofuels is unlikely to drive up food prices and force growers in Asia, South America, or Africa to cut down forests and stop growing food crops. A sustainable US biofuel industry would also not measurably effect global Green House Gas (GHG) production.

The real issue is how the US will manage its own land-use to assure that we can sustainably produce enough gasoline and diesel biofuel replacements to stop our use of petroleum (imported and domestic) for our transportation needs.

Fortunately, while the issue of land use changes brought about by growing bioenergy crops has some short-term market ramifications, if we act prudently, the quantity of land involved represents such a small proportion of our total available natural resources that climate change and food pricing effects will be "lost in the noise" as statisticians say.

Let's go to the numbers about US land use.

If the amount of land converted to sprawling industrial, commercial and residential development from 1982 to 2003 was, instead, planted in energy crops, we would have already achieved significant energy independence.

According to the USDA/NNRCS 2003 National Resource Inventory, the US has 367 million acres of cropland, 117 million acres of pastureland and 405 million acres of forests for a total of 890 million acres.

Using data from the USDA/DOE 2005 "Billion-Ton Supply" study and fuel economy numbers from recent changes to the CAFE (Corporate Annual Fuel Economy) standards, (25 mpg average or 500 gallons/year/vehicle and 150 million vehicles) approximately 60 million acres of land could provide fuel for every passenger vehicle (car/truck/SUV) in the US on a sustainable basis.

So how much of our natural resources would be needed to do this? 60 million acres/890 acres = 7%. Seven percent of 890 million acres is manageable. Unfortunately if we don't act quickly we won't have those 890 million acres to start with and there may a problem further down the road.

Between 1982 and 2003 (USDA/NRCS data) 62.9 million acres (7%) of US natural resources were removed from cultivation. That's the same amount needed to provide the US with biofuel.

About 28 million acres were placed into Conservation Reserve Protection (CRP) meaning this land could potentially be used for biofuel production if proper conservation practices were followed. However, 35 million acres of crop and pasture land were converted into residential, commercial and industrial development, or as it's known, "suburban sprawl." Simply put, **if the land that went into "sprawl" from 1982-2003 instead had been used for biofuel crops, 1/2 of all US passenger vehicles could now be running on advanced biofuels without changing one acre of current agriculture.**

Finally, what would be the impact on worldwide greenhouse gases (GHGs) from a sustainable US biofuels industry? Even if 60 million acres of mature forest land was converted to a mixture of perennial grasses and fast growing Poplar "energy" trees, the difference in GHGs would be so small that it would be "statistically insignificant" over the 50 year period usually used to calculate forest CO_2 production/capture.

Therefore, the real issue is how will we prevent the loss of another 35 million acres of our natural resources that, combined with a prudent use of our Conservation Reserves, could stop our use of petroleum (imported and domestic) for our transportation needs while maintaining the same carbon footprint if those lands remained uncultivated.

If we are going to worry about US land use change effects on greenhouse gas emissions, perhaps we should concentrate on preventing changes that really result in parking lots, pollution and increased vehicle miles traveled rather than on replacement sustainable agricultural practices that benefit carbon capture and recycling.