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Global Guidelines on Agro-Related Fuel

**Multifunctionality of Agriculture Products: Towards a Collaborative Policy  
Guidelines on Sustainable Agro-Related Fuel Development**

### **Abstract**

The primacy of food security overrides that of energy. This is a reasoned view under the United Nations rights-based theories and practice. Within this context, there are voluntary guidelines according to which countries must secure an adequate food supply. Nevertheless, agro-related fuel has recently attracted scientific and commercial attention, following revolutionary thinking concerning the multifunctionality nature of agriculture products and the innovative use of crop resources as conduits in building our energy security and promote economic growth. Consequently, many countries may be facing the need for strategic decision-making in developing an agro-related fuel programme, given the lack of a credible global framework to inform policy approaches. On the back of this complexity, a key objective of this paper is to provide a critical assessment of whether a credible global collaborative framework can bring much-needed certainty to enable developing countries to weigh up the importance and risks involved and to manage all of the related biodiversity intricacies connected to agro-related policy development in relation to the realisation of sustainable food security.

**Keywords:** Agro-Related Fuel, Developing Countries, Food Security, Global Collaborative Framework.

### **Introduction**

In today's society, the development of agro-related fuel is gaining increased scientific and commercial attention, and while this initiative started in developed countries, it has recently entered the policy landscape of several developing countries including Africa, where poverty has always been endemic beyond any imagination. For instance, the African Union has endorsed biofuels as an integral part of the sustainable energy strategy for the continent, believing that biofuel development is one of the most dynamic and rapidly changing energy sub-sectors in the world [1]. Notwithstanding the fact that some countries have the potential to produce biofuel in commercial quantities, only a few African countries had introduced biofuel policies [2].

Central to this is a lack of understanding of the intricacies of agro-fuel policy on the part of the policymakers, who have failed to conduct comprehensive investment analysis on biofuels for national and international markets, including the inadequacy of the policy environment to promote and safeguard the various component parts of sustainable innovative value chains: enhancing policy development; capacity building of the producer's skills; and the governance structures required to create awareness and community involvement.

Before proceeding to the analysis, it is necessary to clarify key terms that could otherwise cause confusion. The term "agro-related fuel" is used broadly in this paper. However, we refer to this as a wide range of fuels that are extracted from plants and crops [3]. The term also indicates a much larger class of technologies that are currently the focus of extensive scientific research and development. These fuels are produced through contemporary biological processes, such as agriculture and anaerobic digestion, where they are created through the fermentation of plant products [4]. Biofuel is mainly available in two types: bioethanol and biodiesel, although the most widely recognised agro-related fuel is likely to be corn- or sugar-based ethanol. Bioethanol is used as a replacement for petrol, which is produced mostly with sugarcane and maize followed by wheat, sugarbeet and sorghum, while biodiesel is used as a replacement for diesel and commonly produced from rapeseed, soybean and palm oil [5].

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The technical processes for the conversion of biomass to biofuels can be achieved primarily via biochemical and thermochemical processes. Thermochemical biomass gasification converts biomass to a combustible gas mixture through partial oxidation at relatively high temperatures. Thermochemical processes can convert both food and non-food biomass to fuel products via pyrolysis and gasification. Thermochemical conversion technologies include combustion, gasification and pyrolysis [6].

While combustion of biomass is the most direct and technically straightforward process, the overall efficiency of generating heat from biomass energy is low. Gasification has many advantages over combustion. It can use low-value feedstocks and convert them not only into electricity, but also into transportation fuels. Biochemical conversions convert the biomass into liquid or gaseous fuels by fermentation or anaerobic digestion. Fermentation of the biomass (starch and cellulose) produces primarily ethanol. Anaerobic digestion leads to the production of gaseous fuel; primarily containing methane [7].

This is high on the agendas of many countries and its economic case has been made. Empirical evidence shows that there has already been a substantial increase in the production of agro-related fuel in key countries, helping to meet rising energy demand in some countries while contributing to environmental objectives and this is expected to grow further. Apart from developed countries, Argentina, Brazil, China, India and Indonesia are some of the countries with high agro-related fuel production [8].

Evidence shows that investments in the agro-related fuel landscape can generate both positive and negative impacts. The positive impacts include increased rural incomes, and, in some cases, the provision of basic rural infrastructure. In other words, driven by the demand for alternatives to oil production, agro-related fuel has been promoted as a means to enhance energy independence, promote rural development and reduce greenhouse gas emissions [9]. Unfortunately, it is not that simple, and the case for agro-related fuel adoption has met stiff resistance from critics, with one emerging body of evidence questioning the overall greenhouse gas benefits of agro-related fuel [10].

More critically, there is a question that is well founded in the so-called “food versus fuel” dilemma, this is the actual socio-economic, cultural and environmental viability

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of agro-related fuel due to the potential negative impacts on food security. This mainly concerns first-generation liquid biofuels [11]. With global demand for biofuel on the increase, there is fear regarding the risk of diverting farmland or crops to agro-related fuel production to the detriment of sustainable food supply. This is the traditional crux of the agro-related fuel controversy. To put it differently, the underlying thesis of these critics – wholly rejected by agro-related fuel advocates – is that large-scale food crops could be diverted for the production of agro-fuel and that this will result in food shortages, cause people to go hungry and disrupt social setups [12].

The so-called food versus fuel dilemma has recently become a “political hot potato”. The empirical relationship of agro-related fuel and food prices is not straightforward, but somehow a link has been ambiguously established, premised on weak evidence, and this has oriented global policy on food supply in relation to fuel security in a profoundly deeper and speculative manner. While the debate concerning its latent pernicious impact is internationally controversial, the best available statistics on the 2007–08 food crisis seem to have pushed this dilemma into previously un-envisaged and uncharted territory [13].

The central thrust of the opposing standpoint in this debate is concerned with the fact that agro-related fuel is a question of agricultural land use [14]. What follows is often the claim that there is a real danger that diverting agricultural land into agro-related fuel production will worsen the global hunger situation, and is likely to compromise the United Nations (UN) Sustainable Development Goal (SDG) to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture by 2030 [15].

The hypothesis here can be tested for its validity by drawing upon existing global experiences of land use and sustainability problems. It is important to understand that food wastes can also be placed in the context of global food security given that of all food produced never reaches a human stomach. Due to poor practices, there are high levels of “food loss” in developing countries, often due to poor equipment, transportation, storage and infrastructure.

There are low levels of unintentional losses but high levels of food waste, in the context of developed countries, which involves food being thrown away by consumers because

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they have purchased too much, or by retailers who reject food because of exacting appealing standards. All these include large amounts of land, energy, fertilisers and water having been lost in the production of foodstuffs which simply end up as waste. So far, evidence suggests that 18 million hectares of forests have been cleared in Indonesia alone under the name of palm oil development [16]. Moreover, Brazilian rainforest has been converted to produce soybean biodiesel, sugarcane and ethanol, Malaysian lowland tropical rainforest has been converted to palm biodiesel, and US central grassland to corn ethanol [17].

The fault was clear, and reading between the lines brings to light why the food versus fuel dilemma has already attracted analytical attention from several international organisations including the United Nations Conference on Trade and Development, and the World Bank. Here, hunger is a terrifying issue that remains morally compelling while its security continues to be an elusive goal. Therefore, if people believe that biofuels derived from crops will take food out of the mouths of hungry people, then there is an ethically powerful argument building against the entire package of biofuel production. Importantly, energy is critical and, placed in a proper development context, it is a commodity that remains important to the global economy [18].

Recognising this, the member states of the International Energy Forum co-operate under a neutral framework to foster greater mutual understanding and awareness of common energy interests in order to ensure global energy security [19]. In a related development, experts predict that agro-related fuel has the potential to meet more than a quarter of the world's demand for energy. This claim is consistent with advocates' accounts that agro-related fuel has the potential to be significantly less expensive than other fossil fuels. Modern agro-related fuel could, therefore, hold the promise of replacing conventional energy – fossil fuel – and, thereby, reduce related carbon emissions [20].

More worryingly, overviews of the global production of agro-related fuel have been provided by a number of reports, including the “European Biofuel Technology Platform”, and in September 2014, the UN published the “State of the Biofuels Market: Regulatory, Trade and Development Perspective” [21]. Prior to this, in August 2013, the Global Renewable Fuels Alliance announced an interactive map showing the

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current mandate and planned target for biofuel production in countries across the globe. The European Union (EU) has developed an “EU Strategy for Biofuels” [22], intended to shape energy security policies and to move away from dependence on non-renewable sources. This policy initiative initially aimed to prepare for the large-scale use of biofuels [23].

All of these forums indicate that global agro-related fuel will grow substantially in the near future to become commonly traded global commodities [24]. One study has already found that world biofuel production increased by 0.9 per cent in 2015, reaching 133 billion litres [25]. This development is in line with projections that by 2020, the agro-related fuel industry will reach \$679,751 billion. Although it declined by 6 per cent in 2015, employment in the biofuel sector stands at 1.7 million (direct and indirect). This is expected to generate an employment impact of more than 2.2 million by 2020 [26].

In this context, the need to maintain a sustainable supply of food is even more complex if one reads into it the presumed threat that agro-related fuel production poses. Meanwhile, the planning strategy of agro-related fuel development is a field that is subject to many factors and that must satisfy multiple stakeholders by taking into consideration many conflicting norms [27]. Several analytical instruments have been proposed in the last decade including: life-cycle assessment, to examine the entire carbon footprint production pathway [28]; tools and approaches for biofuel sustainability assessments aimed at unlocking sustainable community impact programmes; financing options; and the provision of marketing to farmers [29].

Remarkably, while a substantive universal framework for food security realisation exists under the UN architecture, the existing framework pursuant to agro-related fuel is loose, even though energy security is equally important and critical to the socio-economic foundation of the global economy [30]. These frameworks are under the umbrellas of “Global Bioenergy Partnership” [31], “Bioenergy and Food Security Approach” [32], and the “Roundtable on Sustainable Biomaterials” [33], except that these pockets of analytical instruments can be confusing on account of being loose and failing to provide countries with a clear sense of policy purpose.

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The reason for this is perhaps that these tools have been narrowly created to deal with a specific issue and they often focus on market fundamentals because their rationale and scope differ in many areas such as theoretical background, type of inputs needed and results expected – weakening the economic case [34]. There are, therefore, delicate linkages – pursuant to policy complexities – present in the relationships between agro-related fuel and food prices, food supply security, the environment and land use and biodiversity. The aforementioned forums lack the necessary coordinating structure to inform broader policy on agro-related fuel development, since they do not sufficiently cover the complex relationship between the causes for biofuel expansion and its effects at the crossroads of four main policy areas: energy; food and agriculture; environment; and trade [35].

This situation is worsened since most of these policy initiatives are often framed from, or pinned down to, the underlying economics. Consequently, the entire spectrum of the implications of agro-related fuel development is not adequately covered. Critical areas such as the environmental and, critically, the cultural implications of agro-related fuel production in developing countries are somehow ignored – its future dynamics are unclear apart from the economic case [36]. Within this useful view, the issue can no longer be framed in any simple terms (food versus fuel). New and revolutionary thinking is necessary to create alternatives that will inform bold policy initiatives about the future approaches that can highlight the socio-economic, environmental and in particular, the cultural implications of agro-related fuel in developing countries.

Given that currently there is a lack of a credible global framework, a key objective of this paper is, therefore, to provide a critical assessment of whether an international coordinating structure for agro-related fuel that takes into account the social, environmental and cultural impact of developing countries will not bring much-needed certainty to address the regulatory and infrastructure challenges within this sector. This assumption is founded on the understanding that a global coordinating structure or framework will become a one-stop-shop and provide analytical tools that can be used by decision-makers at regional, national or local levels in countries facing strategic decisions on the development of agro-related fuel policies.

### **The UN Guidelines: Agriculture**

Agriculture has historically been the foundation of socio-economic progress and it continues to be so. The agricultural sector plays a strategic role in the process of economic development of a country [37]. A consensus has already emerged that the agriculture sector is the backbone of an economy, providing the basic ingredients to mankind. It is a common assumption in economic history literature that agriculture provides the bulk of raw materials for industrialisation [38].

Promoting productivity across the entire spectrum of agriculture – increasing the general efficiency of diversity in food crops – can maintain socio-economic growth. This has already made a significant contribution to the economic prosperity of advanced countries and its role in the economic development of developing countries is of vital importance, despite this being an issue that is usually overlooked in the extensive literature on economic growth in recent decades. One-third of the world's population still obtains its livelihood from agriculture. Most of the developing countries of the world are exporters of primary products and these products contribute 60 to 70 per cent of their total export earnings and 27 per cent of national income comes from this sector [39].

A key principle to recognise is that nationally, the capacity to import capital goods and machinery for industrial development depends crucially on the export income of the agriculture sector [40]. Agriculture can help reduce poverty for 78 per cent of the world's poor, who live in rural areas and work mainly in farming. It can raise incomes and improve food security [41]. The lessons drawn from the economic histories of many advanced countries tell us that agricultural prosperity has contributed considerably to the fostering of economic advancement [42]. It is correctly observed that the leading industrialised countries of today were once predominantly agricultural; economic historians have traced the various ways in which a prosperous and expanding agriculture formed the base of the establishment and expansion of manufacturing [43].

The UN, through its governance system under the Food and Agriculture Organisation (FAO) has, for decades, advanced a universal shift in agricultural policy with a tendency towards greater global political and domestic government intervention. The evolution of the concepts of the right to food and food security reflect the uneasy

acceptance of the idea that hunger is an immoral problem. It all started in 1945, when the FAO of the UN was founded [44]. In 1996, the FAO organised the 1996 World Food Summit in Rome. This resulted in the UN according emphasis to the normative content of the right to adequate food with the “Declaration of World Food Security” and the “World Food Summit Plan of Action”:

We pledge our political will and our common and national commitment to achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level no later than 2015 [45].

It requested that the right to food be given a more concrete and operational content, and the UN Commission on Human Rights created the mandate of the Special Rapporteur on the Right to Food in 2000 [46]. In 1999, the Committee of Economic, Social and Cultural Rights adopted General Comments No. 12 “The Right to Adequate Food” [47] and described the various state obligations derived from the International Covenant on Economic, Social and Cultural Rights (ICESCRs) regarding the right to food [48]. This places three types of obligation on state parties: the obligations to respect, protect and fulfil the right to food – including the obligations to facilitate and provide [49].

It is now an accepted legal precept that adequate food must be supplied to all people. The UN recognises the importance of countries achieving these objectives and it sought to strengthen this under its “Millennium Development Goals” with the aim of eradicating extreme hunger [50]. To give it an even greater operational force, the UN Commission on Human Rights created the mandate of the Special Rapporteur on the Right to Food in 2000 [51].

Furthermore, in 2002, at the World Food Summit, the FAO adopted the Declaration of the World Food Summit, which called for the establishment of an intergovernmental working group to prepare a set of guidelines on the implementation of the right to food. Spurred by civil society organisations, the FAO sought to strengthen policies that could serve as practical guidance for countries [52]. Later, the FAO Council set up an Intergovernmental Working Group, which drafted the Right to Food guidelines that were later adopted by the FAO Council in November 2004 [53]. The guidelines build on international law and are a set of recommendations that states have chosen regarding how to implement their obligations under Article 11 of the ICESCRs.

In response to growing and widespread interest, the FAO and its partners further embarked on the development of guidelines on responsible land tenure governance in the context of food security and these were officially endorsed by the Committee on World Food Security on 11th May, 2012. Despite these authoritative guidelines, food prices increased dramatically in 2007 and in the first and second quarters of 2008, creating a global food crisis [54].

### **The 2007–08 Global Food Crisis**

Historically, the issues of high prices and price volatility are bound up with one another. The global food supply situation is characterised by continued high and volatile international food prices, which may affect the long-term goal of fighting global hunger [55]. Nevertheless, the existence of price volatility is nothing sensational in itself, since prices follow changes in production and consumption levels. Considering that the supply and demand elasticity of most agricultural products is relatively low, prices can vary relatively sharply from year to year. Why prices change depends on various speculative factors that can also change from year to year [56].

A previously published report from the Organisation for Economic Co-operation and Development and the UN FAO confirmed this view about price volatility over the next 50 years [57]. A later report from the G-20, which also looked at this issue, concluded that price volatility increased from 2000–2010 compared with the two preceding decades. Beginning in 2006, international prices for basic agricultural commodities rose to levels not experienced in nearly three decades [58].

The overriding implication of this crisis has been widely documented, has been the subject of many macro-economic simulations and, more importantly, highlights the inadequacies of the international system to respond accordingly. As the prices of food soared to new heights, many vulnerable countries were confronted with major political crises that threatened government establishments as well as social stability in different parts of the world, in particular Africa, Asia, the Middle East, Latin America and the Caribbean [59].

### **The Distorted Debate: The Blame Game**

There were sharp dividing lines drawn regarding the true causes of the crisis and while the UN called for a calm, careful assessment and a robust approach to finding a lasting solution to the crisis [60], critics attempted to put a spin on the issue, which resulted in a blame game that pushed the debate surrounding “food versus biofuel” into a much tighter controversial territory. This controversy made matters even more complicated as some observers attempted to show that the spike in prices had not been influenced solely, or even mainly, by the conventionally understood cyclical factors but rather, that in large part it was due to industry diversion of food into biofuel production.

Significantly, the World Bank concluded in 2008 that large increases in biofuel production in the United States (US) and Europe were the main reason behind the steep rise in global food prices [61]. Moreover, the US Department of Agriculture’s chief economist, in testimony before the Joint Economic Committee of Congress on May 1st, 2008, attributed much of the increase in food prices to biofuel production [62]. Additionally, an economic assessment report published by the Organisation for Economic Co-operation and Development (OECD) found that an increased demand for biofuel impacted negatively on the prices of global feedstock or crops [63].

More importantly, a comprehensive policy report including contributions by the FAO, the International Fund for Agricultural Development, the International Monetary Fund, the OECD, the United Nations Conference on Trade and Development, the World Food Programme, the World Bank, the World Trade Organisation, the International Food Policy Research Institute and the UN High Level Task Force on Global Food and Nutrition Security concluded that with such a weight of biofuel in the supply–demand balance for feedstock, it is not surprising that the world market prices of these products (and their substitutes) are substantially higher than they would be if no biofuels were produced [64].

As emerged from the discussion that followed the 2007–08 food crises, neoliberal constructions around agro-fuel production made in response to the demands of the market underwent a sharp social crisis of legitimacy. To take one critical illustration, on April 14, 2008, Jean Ziegler, the United Nations Special Rapporteur on the Right to

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Food, at the Thirtieth Regional Conference of the Food and Agriculture Organisation (FAO) in Brasilia called biofuels a “crime against humanity” since using fertile lands to produce fuels reduces the amount of land used to grow food, which in turn raises food prices [65]. He had previously made this claim in October 2007 in an interim report to the UN General Assembly that proposed a 5-year moratorium aimed at banning the conversion of land for the production of biofuels [66].

On the previous day, at their Annual International Monetary Fund and World Bank Group meeting in Washington D.C., the World Bank President, Robert Zoellick, stated that ‘while many worry about filling their gas tanks, many others around the world are struggling to fill their stomachs. And it's getting more and more difficult every day’ [67]. In 2012, the Chairman of Nestle, Peter Brabeck-Letmathe, blamed agro-related fuel for the increase in food prices, stating that ‘if no food was used for fuel, the prices would come down again – that is very clear’ [68].

Despite these statements, the causes of this price upsurge are complex given the combination of mutually reinforcing factors and many other potential drivers of the price rise continue to be mentioned in discussions. Not surprisingly, such complexity has led to different views and mixed empirical evidence and while many analyses of this crisis have concentrated on the causes alone, they have rarely provided a deeper explanation as to the severity of the issue. Now, a conflicting situation has emerged that makes it very difficult, if not impossible, for opponents to counter any general approximation of the contribution of biofuel production towards the increase in food prices [69].

One authoritative report by the UN is consistent with this viewpoint, rejecting, in its entirety, any correlation between biofuel production and the crisis as lacking adequate quantitative validity [70]. Moreover, the empirical assertion that biofuel production can cause such a food crisis was summarily dismissed by the then President of Brazil, Luiz Inacio Lula da Silva, who during the Latin American and Caribbean Regional Conference, retorted that: ‘The real crime against humanity would be dismissing biofuels a priori, relegating countries strangled by food and energy shortages to dependency and insecurity’. This was in response to claims that agro-related fuel production constitutes a crime against humanity [71].

Nevertheless, there may be an evidential deficit here, which means that the relationship between agro-related fuel production and food prices is unclear, and thus, cannot be easily approached from a speculative angle. Pursuant to this, a 2010 study, also by the World Bank, concluded that their previous study may have overestimated the contribution of agro-fuel production, as the effect of biofuels on food prices has not been as large as originally thought, but that the use of commodities by financial investors – the so-called “financialisation of commodities” – may have been partly responsible for the 2007/08 spike [72].

Moreover, the UN concludes that the relationship between agro-fuels and food security is complex and needs careful assessment; it has called for a renewed debate on biofuel. The UN also estimates that millions of indigenous people will be driven from their lands, under customary ownership, to clear the way for biofuel plantations, if current trends are realised [73]. According to the latest estimates in 2015, some 129 million hectares of forest have been lost since 1990, representing an annual net loss rate of 0.13 per cent [74].

The New York Declaration on Forests in 2014 saw some 180 nations, companies, indigenous people and other organisations commit to halving deforestation by 2020 and stopping it by 2030 [75]. There is a heightened recognition that an expansive use of forests can create economic gains, with one estimate suggesting that forest resources, as a share of land demand, will increase by 25–29 per cent by 2030. In other words, if the status quo remains unchanged, then up to a further 170 million hectares of tropical forest could disappear by 2030 [76]. Within this approximation, it is projected that many developing countries will experience the biggest rate of increase in terms of forests converted into palm oil plantations. This is because there are no viable alternatives to palm oil. Besides its use as a cooking medium, its derivatives are hidden in a wide range of consumer and industrial products.

A further related point is that a shift in the production of agro-related fuel has an equally disruptive effect on the environment – a contention firmly established by analysis of the carbon footprint or carbon emissions. Framed persuasively, there are strong indications that the process to produce agro-related fuel – including the machinery

necessary to cultivate the crops and the plants to produce the fuel – has a hefty carbon emissions footprint. Compounding all of these negative views leads to a disturbing line of argument, which essentially appears to confirm the food versus fuel dilemma, referring to the possibility that farmers increasing their production of these crops shift their time and land away from other types of non-biofuel crops, driving up the price of non-biofuel crops due to the decrease in production [77].

### **Averting a Potential Future Energy Crisis**

As can be seen above, energy is considered to be the lifeline of an economy – the most vital instrument of socio-economic development – and it has been recognised in relation to the traditional factors of production as one of the most important strategic commodities. A properly modelled or a scenario for the manifestation of energy crisis is a broad and complex topic and popular literature depicts the view that the security of global energy supplies continues to be problematic. There has been an enormous increase in the global demand for energy in recent years as a result of industrial development and population growth and further growth is expected, which may trigger an energy crisis as fossil fuels are diminishing as the demand rises. Here, energy security is dependent on two factors: the source of supply and the distribution infrastructure [78].

More importantly, macroeconomics teaches us that any supply-shock-induced energy crisis will have a rebound effect on the global economy, in particular when energy is the resource used to exploit all other resources. With ubiquitous economic modernisation, production processes have become heavily dependent on energy: sustainable economic growth cannot be achieved without a sufficient and uninterrupted supply of energy, and notwithstanding this, most people would not commonly feel connected to its reality unless prices go up.

The demand challenge, the coming era of limited and expensive energy, will be very difficult for most economies but this will be even more difficult for developing countries if it is not anticipated. From a global perspective, we rely on fossil fuels for over 90 per cent of our current energy needs – a situation that shows little sign of changing over the medium-term without drastic policy changes. Understandably, this

is causing a fear that our energy resources are starting to run out, with devastating consequences for the global economy and global quality of life. On top of this, various indicators, in particular empirical accounts of global warming, reveal that the current evolution of the world consumption is on an unsustainable path, which means that the world may be heading for an energy crisis [79].

To put it mildly, the commonly held belief as manifested in the academic literature is that the same indicators and warning signs that existed prior to the energy crises of 1973 and 1979 exist today, except that the current problem is even worse than the previous two energy crises because, unlike the 1970s, we are starting from a case of low, or no, certainty in terms of economic growth in the midst of austerity measures and mounting public debts. Within this view, there is a strong case for global action to pre-empt a new supply shock.

Energy interdependence and the growing scale of the energy trade requires continuing collaboration among stakeholders to ensure the security of the entire supply chain. It is of utmost importance that the public, and especially policymakers, understand the global energy crisis and its underlying science in order to avoid a serious energy crisis in the coming decades. Therefore, people should actually be urging their governments to come to an international agreement to work with properly functioning global markets to help meet future energy demands by absorbing shocks and allowing supply and demand to respond more quickly and with greater ingenuity [80].

### **Corporate-Led Agro-Related Fuel Development and its Implications**

Companies have spread out their search for new profit opportunities – often meaning seeking out areas of the globe where resources can be had very cheaply and without major restriction. Now, multinational corporations (MNCs) exert a great deal of power in the globalised world economy. In terms of the so-called “New World Order”, they influence the policies of governments worldwide and they help to order the agenda of the World Trade Organisation (WTO). These corporations are closely linked to the WTO decision-makers themselves. Many of them are richer and more powerful than the states that seek to regulate them. The influence of MNCs over public policy

continues unabated and they influence the destinies of individual economies in the developing world and even in developed countries [81].

International trade under the WTO jurisprudence has assisted corporations in accessing new markets and new resources. To this end, many corporations have stretched their operations across the globe. It is, therefore, no coincidence that, often with institutional and government support, the concentration of power in the hands of a few corporate elites has broadly paralleled the growth in levels of inequality, widespread environmental degradation, and the undermining of essential socio-cultural issues across the world [82]. The neoliberal economic model, even though it was somehow discredited during the financial crisis of 2008, remains the dominant paradigm driving policy decisions today – and remains censured to the fundamental fairness in wealth-sharing either within or between states [83].

However, although MNCs have been granted new freedoms and opportunities, this has not been accompanied by a reciprocal globalisation of a socio-cultural balance on a wider scale on which developing countries could predominantly protect their interests. The fundamental reason for this is that developing countries generally do not set standards in international agreements and they commonly become followers. The quantitative growth of MNCs in agro-related fuel production reinforces the contention that agro-related fuel production has automatically become part of the global trading system [84].

The existing standard on which the relevance of agro-related fuel policy is discussed is too loose, and lacks a proper coordinating structure. More specifically, issues around the development of agro-related fuel and its dynamics have been discussed in a plethora of documents and forums. Nonetheless, all these are excessively restricted to the economic interests of key developed countries. Expansion of biofuel production in the US and western Europe in recent years has pushed up food prices and boosted inflation, creating serious problems for poor food-importing countries around the world [85].

The whole landscape of agro-related fuel is feared to be overly corporate-led, meaning that valuable insights into contextual factors that leverage policies are premised on profit interests. The relevance of agro-related fuel policy formulation should be

evidence-based, provided by sustainable risk assessment founded on proper empirical foundations. In the absence of this, indigenous people are deprived of their participation in the governance and the decision-making processes that could empower them to increase their capabilities as well as to take opportunities to participate in the agro-related fuel development.

In this context, critical questions concerning the fundamental purpose and future possibilities of agro-related fuel may be distorted, since within such a familiar situation the corporate-influenced policymakers are often framed within economic rubrics – ignoring other social, environmental and cultural implications. This affects the ability of the poor to make informed livelihood choices, as they are unable to access critical information regarding the markets, as well as the key social, environmental and cultural dimensions. It is, therefore, essential to systematically promote and discuss the dynamics of this on an international level – the key challenge is how to create constructive engagement in order to restore a balance that cuts across countries.

### **The Notion of Multifunctionality of Agriculture**

Upon consideration, the reasoned position will support the notion of a “multifunctionality” of agriculture. Multifunctionality refers to the fact that an economic activity may have multiple outputs and, by virtue of this, may contribute to several societal objectives at once. Multifunctionality is thus an activity-oriented concept that refers to specific properties of the production process and its multiple outputs [86]. Following the 1998 OECD ministerial meeting that attempted to put forward a working framework that would allow a rigorous policy of the “multifunctionality” vision of agriculture, this concept has gained wider acceptance and, in a broad sense, remains a central part of the current global collaborative initiative aimed at realising food and energy security in tandem.

The 1998 OECD Ministerial Communiqué gave multifunctionality a normative aspect [87]. The added perspective was spelt out in Paragraph 15 of the Ministerial Communiqué, which lists as one of the adopted policy principles to ‘...preserve and strengthen the multifunctional character of agriculture...’. Paragraph 13 of the Ministerial Communiqué further stipulates that agro-food policies should allow the

manifestation of the multifunctional character of agriculture. The OECD's analytical framework typified the concept of multifunctionality in agriculture in terms of the public good aspects of the multiple outputs of agriculture, and their implications for policy formation.

For example, the Synthesis Report of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) [88] captures the complexity and diversity of agriculture by calling for a multifunctionality approach to meet the development and sustainability goals of the reduction of hunger and poverty, the improvement of rural livelihoods and human health, and facilitating equitable, socially, environmentally and economically sustainable development. The IAASTD report uses the concept of multifunctionality to express the inescapable interconnectedness of agriculture's different roles and functions.

The concept of multifunctionality recognises agriculture as a multi-output activity producing not only commodities (food, feed, fibres, agrofuels, medicinal products and ornamentals), but also non-commodity outputs such as environmental services, landscape amenities and cultural heritages. Basing agricultural policy on the multifunctionality concept implies that the full range of agriculture's many functions will be considered when shaping policies. According to the IAASTD, this would entail a rethinking of the role of agriculture in achieving development and sustainability goals; defining a new role that seeks more intensive engagement across diverse worldviews and possibly contradictory approaches that can inform and suggest strategies for actions that enable the multiple functions of agriculture.

However, successfully meeting development and sustainability goals and responding to new priorities and changing circumstances would require a fundamental shift in global policy, including in science and technology, and a matching shift across institutions, capacity development and investment. Such a shift would recognise, and give increased importance to, the multifunctionality of agriculture, accounting for the complexity of agricultural systems within diverse social and environmental contexts. It would require new institutional and organisational arrangements to promote an integrated approach to development. Therefore, the IAASTD called for the

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development of multifunctionality policy consensus via a shared approach to sustainability with local and cross-national collaborations.

In 2015, countries during the Climate Change Conference made commitments towards a more environmentally balanced future through the Sustainable Development Goals (SDGs). They now seek to expand policies for low-carbon development following the agreement reached in Paris. The linkages between energy and development are now high on international agendas following the adoption of the SDGs by the UN. SDG 7, which deals with sustainable energy, specifically calls for universal access to affordable modern energy, a substantial increase in the share of renewable energy in the global energy mix, as well as gains in energy efficiency [89].

Since April 2009, the EU's agro-related fuel policy has been underpinned by Directive 2009/28/EC on the promotion of the use of energy from renewable sources, which reasserts the 10 per cent target and establishes that the community should take appropriate steps for the promotion of sustainability criteria for biofuels production [90]. However, given that agro-related fuel production typically takes place on cropland which was previously used for other agriculture such as growing food or feed, the EU in 2015 introduced new rules that amend the current legislation on biofuels [91]: the Renewable Energy Directive [92] and the Fuel Quality Directive [93] to reduce the risk of indirect land use change and to prepare the transition towards advanced biofuels.

The Directive intends to place limits on the share of biofuels from crops grown on agricultural land that can be counted towards the 2020 renewable energy targets to 7 per cent. This Directive finds logic in the notion of sustainable development of the agro-related and such a sustainable approach would benefit the policy stream in overcoming the conversion of agricultural lands from food to agro-related fuel production.

This will sit well alongside some international norms that seek to address the climate change threat; particularly, United Nations Framework Convention on Climate Change (UNFCCC), 1992. Importantly, Article 4 of the 1992 UNFCCC supports bioenergy as one of the 'precautionary measures to anticipate, prevent or minimise the causes of climate change and mitigate its adverse effects', requiring that these measures 'take into account different socio-economic contexts, be comprehensive, cover all relevant

sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors' [94].

### **Towards a Global Coordinating Framework**

International instruments are the most frequent means of creating international standards. For a long time, international framework agreements have helped to achieve the goal of establishing the normative significance of fundamental social standards – manifesting them sustainably in concrete terms. They are developed with the aim of creating rules for the application of common norms that states and other actors of the transnational community are supposed to abide by [95]. Here, there is a widespread understanding that reinforces the acceptance of the axiom that if international institutions or instruments to enforce international law are created, then effective governance can be realised for agro-related fuel production.

Given the global context of agro-related fuel development, it seems natural that an international framework would be of benefit. This framework could enable the development of an appropriate international network, bringing together global civil society and non-governmental organisations, for the purpose of the appraisal and re-evaluation of the socio-economic purpose, as well as the environmental and cultural implications of agro-related fuel policy. The theoretical approach here rests on a discussion of these norms and their constitutive role. This role creates a community and gives an institutional basis for the global public domain. Noting that national policies and customs vary widely from country to country, even between countries in the same region, such a framework would provide an agenda for countries to establish an enabling environment – policies, institutions, governance – grounded in a sound evidence-base.

Some international consensus on sustainability requirements is required, given the international dimension of the sector. Agro-related fuel production is clearly still on a learning curve and such a consensus will help countries to secure the socio-economic purposes of agro-related fuel development; weighed against their environmental and cultural protections. Integrating sustainability requirements into policy frameworks and law allows governments to have a mechanism in hand with which to regulate and

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enhance sustainability in economically viable chains; although law and regulation may not grasp and fully enforce the concept of sustainability alone.

One of the biggest weaknesses identified by the classical theorists of international law is related to the voluntarist approach to international law, and its enforcement quality. There is an open consensus that international law fails to have the desired impact due to the absence of an enforcement mechanism. Nevertheless, this argument has largely been set aside by the increasing significance of the international treaty-making process [96]. This will help accommodate the many differing viewpoints on best practice and help introduce a broad range of structures that can be relevant in all parts of the world, as well as a platform for setting standards and reevaluating those standards, as governments have a role to play to make sure that vulnerable groups can be included in a transition towards sustainable agro-related fuel management practices.

This includes capacity building and support for creating a feasible business model of agro-related fuel production locally. This will help the local community to familiarise with new, sustainable models and crops, as well as dissemination and sharing of experiences and lessons learned from other countries including the benefits from technology transfer and skills to improve methods of production. Added to these are the benefits of understanding of aspects such as enhanced capacity building, improved market access and improved sustainability in the value chain.

### **Justification for the Global Collaborative Framework**

The basic idea underlying this approach would be that, in the context of international cooperation, efforts done in the name of development should be conducive to the fundamental interest of the domestic people as opposed to the economic interests of key developed countries or MNCs. This would help to promote human rights values given that economic, social and cultural rights continue to be marginalised politically, even as their legal interpretation progresses under the UN system. Moreover, a global governance system would contribute to the improvement and development of the policy, legal and organisational frameworks regulating the range of tenure rights that exist over biodiversity resources.

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This will strengthen an institutional framework that places agro-related fuel at the centre of the domestic development efforts it aims to support. The framework could complement the institutional and global policy action or closely follow the format of other UN FAO instruments that set out principles and internationally accepted standards for responsible practices, in particular, it could improve land tenure governance by providing guidance and information on internationally accepted practices for systems that deal with the rights to use, manage and control land and forests where indigenous people remain the custodians.

Moreover, with a global collaborative framework, the development needs of developing countries could be interpreted and applied in a way that is consistent with the existing obligations under national, regional and international legal provisions, and with due regard to international development commitments. As these become complementary to national, regional and international initiatives, they could be re-evaluated to support a holistic national strategy covering policy areas such as economic development, market systems, social policy and infrastructure development.

With this understanding, the international framework could strengthen the capacities and operations of the implementing agencies: judicial authorities; local governments; organisations of farmers and small-scale producers; civil society; academia; and all persons concerned with tenure governance, as well as promoting cooperation regionally. This could be an opportunity to facilitate the building of stronger networks among developing countries, which will eventually deepen economic and political cooperation and create further opportunities to strengthen mutual decision-making for the immediate interests of the indigenous people.

Within this approach, civil society and the non-governmental organisations that represent the interests and will of citizens may be able to raise and shape policies that are critical to the protection of the public interest. This platform could be used as leverage for other kinds of market access negotiations for developing countries, given that even though market access was a significant issue agreed under the multilateral trade agreement during the Uruguay Round of trade negotiations, this is still a mirage [97].

### **Conclusion**

While food remains a critical commodity for human development, fuel is commonly held as the backbone to global economic growth. Shortages in the supply of both have several important implications. Nevertheless, the incentive to realise both commodities is not straightforward, and this has now become a controversial debate that continues to turn on the food versus fuel dilemma. One important fact is that agriculture produces far more than just food: multiple uses of farming commodities and considerations beyond food security deserve to be considered.

Consistently, recent scientific endeavours hold that the exploitation of crop diversity for the production of agro-related fuel can provide us with a sustainable supply of clean energy and economic growth. More importantly, the production of agro-related fuel, and its markets, are increasing and it now sits at the forefront of global market intervention due to the process of globalisation and the conditions that it creates. In other words, the normative status, the empirical and factual significance of agro-related fuel, is subject to permanent or ongoing development.

Agro-related development will be shaped by the changing consumption and demand patterns, and it will certainly be fulfilment of a long awaited common desire to replace petroleum-based fossil materials with environmental-friendly products, which is underpinned by the growing concerns over energy security and GHG emissions. While this is true to an appreciable degree, it appears that there is not only a lack of open information concerning the socio-economic purposes of it, but also, its environmental and cultural dynamics are not clear. Now, many developing countries may be relatively sceptical about agro-related fuel policy development, and interest groups may resist policy programmes to that effect.

Clearly, these resistances may be fuelled by wild speculations or premised on false propositions; however, these exist predominantly due to the lack of a credible global platform to inform holistic understandings of the dynamics of agro-related fuel policy developments. Equally, this may affect the ability of the public and private sectors to invest in agro-related fuel in developing countries. While food has common persuasive guidelines on which to pursue its sustainability within the ambit of the UN, this is not

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the case for agro-related fuel development. This then leaves us with one patent conclusion – that a credible global collaborative platform on which to engage all stakeholders to inform broader policymaking in agro-related fuel development, similar to the global food guidelines under the UN FAO system, is required.

This global collaborative framework may then be used as a benchmark to streamline policy guidelines for countries that are keen to engage in this sector. This approach will provide an interesting framework for countries' policy deliberations or for carrying out valid reporting mechanisms that represent crucial elements in assessing the outcomes of such policy standards. Within this context, domestic social actors can be represented and become relevant players in the process of establishing global governance or collaborating to catalyse transparency at all levels, to ensure the dissemination of lessons and best practices, and to promote the acceptance of a diversity of approaches, including technology choices based on unique national and local circumstances.

This approach could help strengthen policies and provide information to policymakers to ensure that agro-related fuel policy development is evidence-based and that applications are in accordance with national legal systems and their institutions as well as in line with the domestic socio-economic, environmental and cultural needs of the member states. The important conclusion is that countries can weigh up their own biodiversity vulnerability and put in place safeguard measures in order to ensure that they understand the risks involved – managing their own resources and enabling the people to reap the benefits of agro-related fuel development. This approach means that many countries can chart a path forward and that all stakeholders, particularly the indigenous people, can identify critical action areas and provide countries with a roadmap towards economic development.

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