



**China Council for International Cooperation on Environment and
Development**

China's Role in Greening Global Value Chains

CCICED Special Policy Study Report

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Abbreviations

- AIIB – Asia Infrastructure Investment Bank
APEC – Asia-Pacific Economic Cooperation
ASC – Aquaculture Stewardship Council
BCI – Better Cotton Initiative
BRI – Belt and Road Initiative
CCCMC – China Chamber of Commerce of Metal, Minerals and Chemicals
CCICED – China Council for International Cooperation on Environment and Development
CDB – China Development Bank
CFNA – China Chamber of Commerce for Foodstuffs and Native Produce
COFCO – China National Cereals, Oils, and Foodstuffs Corporation
CQM-PCC – China Quality Mark Certification Group Production Certification
EGA – Environmental Goods Agreement
FAO – Food and Agriculture Organization
FSC – Forest Stewardship Council
GDP – Gross Domestic Product
GHG – Greenhouse gas
G20 – Group of Twenty
IUU – Illegal, unreported or unregulated
MEP – Ministry of Environmental Protection
MSC – Marine Stewardship Council
MOFA – Ministry of Foreign Affairs
MOFCOM – Ministry of Commerce
NDB – New Development Bank
NDRC – National Development and Reform Commission
NGO – Non-governmental organization
OECD – Organization for Economic Co-operation and Development
PEFC – Program for the Endorsement of Forest Certification
RSPO – Roundtable on Sustainable Palm Oil
RTRS – Roundtable on Responsible Soy
SASAC – State-owned Assets Supervision and Administration Commission
SDGs – Sustainable Development Goals
SOE – State-owned Enterprises
SPS – Special Policy Study
UN – United Nations
UNDP – United Nations Development Programme
UNEP – United Nations Environment Programme
WTO – World Trade Organization

KEY FINDINGS AND CONCLUSIONS

Global value chains organize social and economic activities and add value to commodities and services by linking production, logistics, consumption and recycling processes, which forms a global or regional inter-firm network. Through cooperation and participation in global value chains, firms gain capacity building, added value and win-win arrangements. Greening global value chains means mainstreaming sustainable development concepts into the rules and practices of global value chains – a green reboot.

International production, trade and investments are increasingly being organized within global value chains. They underpin economic globalization, and are vital to the development of every country and every firm along the value chains, linking industries and economies worldwide. As is evident in the SDGs and in the Leaders Communiqué from the 2016 G20 Summit in Hangzhou – global green value chains are thus central to the challenge of sustainable development, and building a coordinated, inclusive and green global value chain system is key to the sustainable development of the world economy.

In this study, we identify the positive roles China can play in building a global green value chains framework. Given limited time, we have focused on the global value chains for commodities, particularly select soft commodities, which comprise a modest part of China's trade with the world but a very significant part of its impact on the Earth's resources. We studied six commodities in depth – seafood, soy, palm oil, cotton, forest products and copper – to understand these markets, their impacts, China's role, and the path to sustainability. We reached the following three important conclusions:

- Global Value Chains Need a Green Reboot - and China Can Lead the Way**

Building coordinated, inclusive and green global value chains is an urgent imperative. It will require new ways of thinking about international investment, trade, production and cooperation. Greening global value chains for sustainable development will also require capacity building of countries and companies and policy coordination. In the process, the participation of developing countries, especially emerging economies, will be exceptionally important for making new rules.

With the rising ease in trade and investment, and as the second largest economy, China can play an important role in the green reboot of global value chains and, in some areas, a leading role. China is uniquely positioned to influence the establishment and rule-making of green global value chains – through its policies; through its trade and investment, especially in the South; and through its guidance to and regulation of the activities of Chinese companies. This helps Chinese companies, who will become a new driving force for sustainable development, to learn and adapt to new rules more quickly.

China's Ecological Civilization and Green Development concepts embody an international vision. China can practice its leadership in building green global value chains through its commitment to the Green Belt and Road Initiative, to strong South-South cooperation, and to shared development.

- **Greening Global Value Chains for Commodities, in Particular, is Central to Sustainable Development**

Global value chains for commodities are the “headwaters” of the economy – the sources of raw materials for food, clothing and manufacturing. But they are also a major source of pressure on the Earth’s resources – driving the depletion of water, land, forests and fisheries, in many places, and a significant share of global greenhouse gas emissions. Governments have often struggled to manage these pressures, and their various efforts have been undermined by a burgeoning trade in illegally harvested or produced commodities.

To implement the Paris Agreement and 2030 Sustainable Development Goals (SDGs), governments have now set a different course and, indeed, at the Hangzhou G20 Summit, the assembled leaders called on governments to “facilitate sustainable agricultural development and food value chains.” There is extraordinary potential to combine government action with action by enterprises and civil society. Just 500 large companies (including many Chinese ones), account for 70% of the trade in the commodities that pose the greatest sustainability challenges. This is a challenge and an opportunity. Many of those companies are already making commitments, and the rise of “voluntary sustainability standards” has provided the basis for translating commitments into better practices. Rapid innovations in data technology hold the potential for a new level of transparency and traceability in value chains, creating both impetus and means for action. These international efforts cannot succeed, however, without the active participation and leadership of China, the most important player in the market.

- **It is in China’s Interest to Lead the Greening of Global Value Chains for Commodities**

We find that China’s leadership on greening global value chains will be essential to its own security and priorities and to its role in the world. Global value chains will have to be green to continue to meet China’s needs for commodities that are important to its food security and economy, to reduce the intensity of resource consumption, and to open up more safe space for sustainable development.

More broadly, we find that leadership in greening global value chains will be important to China’s future competitiveness. China’s reputation for responsible, sustainable performance will increasingly determine its ability to source the commodities it needs, and its ability to sell the products it produces. Companies’ sustainable operations will also earn them societal reputation and trust.

We also find that greening global value chains should be a central element of China’s growing global role. China has taken a new leadership role in helping the world come

together in the SDGs and the Paris Agreement. China has also set out to create a new model of development, guided by the idea of an Ecological Civilization, with strong South-South cooperation, and, through the Belt and Road Initiative, building inclusive, equitable regional economic integration. Global value chains will in fact be at the very heart of this new model for international cooperation, and they will serve China's objectives and obligations, only if they are green.

KEY RECOMMENDATIONS

Green global value chains – value chains that are environmentally, socially, and economically sustainable – will play a crucial role in the green rise of China. Chinese agencies and enterprises have begun exploring the potential for green global value chains and Chinese consumers are increasingly demanding green products. However, bold action from Beijing is required to set this new direction and enable the shift. We therefore offer several recommendations, set out in more detail at the conclusion of our report. In short, we recommend that the Government of China should:

- **Play a leadership role in promoting the sustainability of global value chains in international governance and policymaking.**

China should promote an integrated policy package that addresses investment, trade, standards, certification, and capacity building. It should advance these ideas in multilateral fora – through the creation of an Eco-20 within the G20 and in the WTO negotiations on environmental goods and services. Furthermore, China should align its sustainability standards with international standards. In the meantime, China should work with key producing countries to forge bilateral “sustainable sourcing agreements” that can provide both long-term security of supply and assurances of sustainability, a win-win for China and its trading partners.

- **Send a clear policy signal to encourage Chinese companies and multinational companies trading in China to green their global value chains.**

As a growing number of multinational companies have begun to take action on the sustainability of global value chains, Chinese companies have generally held back, awaiting a signal from the government. The State Council should give that signal. They should encourage companies to join voluntary international efforts, such as the growing effort to reduce deforestation. They should also instruct the relevant ministries to enable and incentivize action, for example by establishing standards and systems for traceability and by providing financial incentives.

- **Create an action plan for greening global value chains as a core priority for the Belt and Road Initiative.**

BRI will be building global value chains that serve 60 percent of the world’s population and it will be important to ensure that they can be sustained. This will require systems to assure the legality and sustainability of goods in trade, providing green finance to enable sustainable production, and forging new collaborations across the BRI region to share best practices.

- **Invest development aid and other finance resources in greening global value chains.**

As China pioneers new models for bilateral and multilateral development assistance, it should address the central and growing importance of global value chains, including

particularly commodity value chains, for its partner countries. Development assistance will be essential to enable producing countries to better manage their natural resources such as freshwater, forests and fisheries; to improve productivity; and to put in place the traceability that will allow Chinese companies to buy goods with the confidence that they were legally and sustainably produced. NGOs can be valuable partners in implementing these efforts.

First Steps

There are several steps that China can take immediately to set this new course. We recommend that:

- (1) **State-owned Enterprises:** The State-owned Assets Supervision and Administration Commission (SASAC) should mandate SOE's to assure the sustainability of the commodities they buy that impose major global environmental impacts;
- (2) **Pilots:** The Government of China should launch a pilot program to establish best practices for greening the global value chains for soy, palm oil and forest products;
- (3) **Development Assistance:** The Ministry of Environmental Protection, NDRC, and MOFCOM should jointly launch a “Green Global Value Chain South-South Cooperation Platform” under the newly-established “South-South Cooperation Fund on Climate Change” to support China’s major commodity supplier countries in improving the sustainability of commodity production and trade.

PROJECT BACKGROUND AND OVERVIEW

For centuries, as countries have grown their economies they have outsourced their demands on the environment, increasingly relying on the resources – water, land, forests, and fisheries – of other countries, and exporting high-polluting industries. With the Paris Agreement and 2030 Sustainable Development Goals (SDGs), the world has now set a different course. China is poised to lead by helping the world chart a path that embodies its commitments to an Ecological Civilization, to the Green Belt and Road Initiative, to strong South-South cooperation, and to shared development.

Global Value Chains

Global value chains are the processes by which value is added across different stages from production to consumption and carried out by actors located in different parts of the world. Supply chains are a component of value chains that are principally the logistical linkages at a firm level.¹ International production, trade and investments are increasingly organized within global value chains that are largely coordinated by multinational corporations and under rules that are shaped by both international and national institutions.² Evident across a range of sectors, including manufacturing, services, and commodities, global value chains underpin economic globalization and are vital to the development of many countries, linking industries and economies worldwide. In 2011, nearly half of world trade in goods and services took place within global value chains; nearly three fourths for emerging economies like China.³

China sits at the heart of the world's global value chains. It is the world's largest merchandise trader and the second largest importer, accounting for 10.3% of world's total imports in 2014, about US\$ 2 trillion.⁴ China is a large consumer of a broad range of primary commodities, consuming about 20% of non-renewable energy resources, 23% of major agricultural crops, and 40% of base metals in 2010.⁵ It should also be noted that China, since 2008, has been the most important single export market for Least Developed Countries, the exports of which have always been characterized by a handful of primary products.⁶

¹ OECD, WTO and World Bank Group. (2014). Global Value Chains: Challenges, Opportunities, and Implications for Policy Report prepared for submission to the G20 Trade Ministers Meeting Sydney, Australia, 19 July 2014.

² Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The Governance of Global Value Chains. *Review of International Political Economy*, 12(1), 78-104.

³ ICTSD and WEF. (December 2013). Global Value Chains: Development Challenges and Policy Options. International Center for Trade and Sustainable Development and World Economic Forum.

⁴ WTO. 2015. *World Trade Report*. https://www.wto.org/english/res_e/booksp_e/wtr15-1_e.pdf.

⁵ IMF. (2012). China's Impact on World Commodity Markets. <https://www.imf.org/external/pubs/ft/wp/2012/wp12115.pdf>

⁶ WTO. 2014. Market Access for Products and Services of Export Interest to Least-Developed Countries. <http://unohrlls.org/UserFiles/File/LDC%20Documents/AHWG%20on%20smooth%20transition/WTCOMTDLDCW51.pdf>.

Global value chains are a key mechanism for shaping the path to achieve an Ecological Civilization. A growing number of international actors – both governments and enterprises – are taking actions to move important global value chains toward sustainability. The success of these efforts will depend on China’s action and leadership. Taking a leadership role will also serve vital national interests, including its own economic development, its food security, and recognition of its role in the world.

This Study

CCICED has done important work on Green Supply Chains, notably via a previous SPS and Policy Pilot Project, which encouraged APEC to establish a clearinghouse network on Green Supply Chains with the first link in Tianjin. This work focused primarily on manufactured products and green procurement by governments and the private sector.

CICED’s work on Sustainable Consumption led to a recognition that much more needs to be done at the level of consumers, producers, retailers and wholesalers, and on the part of importers and exporters. There is both a need and great opportunity to expand upon the Green Supply Chains and Sustainable Consumption concepts to discuss the Green Global Value Chains of, in particular, commodities that feed Chinese consumers and that support important export markets.

In this Special Policy Study, we focus mainly on global value chains for commodities, particularly “soft” commodities. That focus may be surprising, as soft commodities are a relatively small part of China’s global trade. Nevertheless, they are a very large part of China’s (and the world’s) impact on the forests, freshwater, oceans, and climate that sustain us all.

To understand the challenges of greening global commodity value chains, and to elucidate solutions, we studied several cases in depth. We examined the global value chains for soy, palm oil, and seafood – three staples for which China depends significantly on production overseas (and, in the case of seafood, also has a booming export market). We also looked at timber and cotton, which are important both for domestic consumption and for significant industries. Additionally, we looked at copper, a “hard” commodity that is also sourced largely from overseas and that underpins the entire economy.

This collection of cases represents the diverse sustainability challenges found in global commodity value chains – including both environmental challenges, such as fisheries depletion, deforestation, water scarcity, and climate change; and social challenges, such as inappropriate labor practices and conflict with local communities. These cases also highlight potential solutions, including initiatives already underway internationally and in China, that offer opportunities for cooperation or examples to be emulated.

Our analysis revealed the severity of social and environmental impacts of China’s imports in source countries and the risks to China and the world if no action is taken. We also found that a robust set of tools are available to address the challenge of greening global value chains, some already being deployed with success by Chinese companies and suppliers. Based on our findings, we developed a concrete set of policy recommendations

to set China on a path of global leadership in building an interconnected and sustainable economy.

Our report is set out in five sections. The first section, Section 1, reviews the impacts of global commodity trade, and the opportunities to move it toward sustainability. Section 2 provides brief summaries of our six case studies, and the insights they offer. Section 3 outlines the relevance of green global value chains to China's interests and priorities. Section 4 provides an overview of relevant policy tools. Finally, Section 5 sets out our recommendations for the journey China should undertake, and the first steps.

Keywords: global value chains; greening global value chains; economic transition; commodity; global governance; ecological civilization

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1. GLOBAL COMMODITY VALUE CHAINS – IMPORTANCE AND OPPORTUNITIES

The world's ability to achieve the ambitions of the SDGs and the Paris Agreement will depend significantly on how it manages the global value chains that are the arteries of the global economy. Global value chains for commodities are both mainstays of developing economies and also significant drivers of many of the most acute sustainability challenges – including depletion of water resources, conversion of forests and other habitat, degradation of the oceans, and climate change. The imperative of greening global value chains for commodities thus runs like a red thread through the SDGs. Recent developments offer promise, however, that collaboration among governments, enterprises, and civil society can move the world onto a more sustainable course.

1.1. Importance – the Impact of Global Commodity Value Chains

It is well-documented that the rapid growth in the world's demand for resources is straining the Earth's capacity to support us. The International Resource Panel convened by UNEP, for example, found that global material use (including minerals, fossil fuels, and biomass) has tripled over the past four decades,⁷ and estimated that the world could run out of recoverable minerals and energy resources before the end of the next century.

More broadly, WWF's Living Planet research estimates that over those past forty years, human consumption has outstripped the planet's regenerative capacity.⁸ This growing pressure has already caused a precipitous decline in the health of the planet's living systems. The United Nations (FAO-UNDP) reports that 51% of the world's arable lands are moderately to severely degraded.⁹ Half the world's moist tropical forests – the planet's most biologically diverse ecosystems – have been lost to logging and clearance for agriculture in the past 50 years.¹⁰ In many water basins, water is being withdrawn faster than its being replenished. One analysis found that, if current trends continue, stocks of all remaining food fish are predicted to collapse by the middle of the century.¹¹ In short, many of the vital resources and natural systems that underpin the global economy have become so depleted or degraded that they may not be available at any price if near-term action is not taken to manage them more sustainably.

Global value chains play a prominent role in driving this decline. A recent analysis found that expansion of commercial agriculture was responsible for 71% of the destruction of

⁷ UNEP. (2016). Global Material Flows and Resource Productivity. Nairobi, Kenya: United Nations Environmental Programme.

⁸ WWF. (2014). Living Planet Report 2014: Species and Spaces, People and Places. Gland, Switzerland: The World Wide Fund for Nature.

⁹ Gomiero, T. (March 28, 2016). Soil Degradation, Land Scarcity and Food Security: Renewing a Complex Challenge. *Sustainability*, 8(2):1-41.

¹⁰ Mongillo, J. & Zierdt-Warshaw, L. (2000). Tropical Forests. In Encyclopedia of Environmental Sciences. Rochester, NY: University of Rochester Press.

¹¹ Worm, B. (2006). Impacts of Biodiversity Loss on Ocean Ecosystem Services. *Science*, 314, 787.

tropical forests over the past fifty years.¹² Agriculture accounts for 70% of water use globally, and “thirsty” crops grown for export, such as cotton and sugar, are a large part of that burden in some regions.¹³ Overfishing is driving depletion of fish stocks – the FAO estimates that more than 90% of commercial fish stocks are now overfished or fully exploited.¹⁴ Global commodity production is a major contributor to climate change – the IPCC found that agriculture and deforestation account for 24% of global GHG emissions.¹⁵

Governments have often found it difficult to address these challenges. Global market demand creates enormous pressure to continually expand production, despite the mounting costs. Where governments have taken steps to assure more sustainable production of commodities and conserve their natural resources, their efforts have often been undermined by rampant illegal trade. It is estimated that 12% to 27% of the global wild fish catch is harvested illegally.¹⁶ Recent analyses suggest that 15% to 30% of the annual volume of timber in international trade has been harvested illegally (and as much as 90% in certain countries).¹⁷ And illegal deforestation continues to underpin commodity production, including an estimated 39% of palm oil and 19% of soy.¹⁸

1.2. Opportunity to Transform Global Value Chains

Global value chains are vast and complex, and linking destructive practices in an exporting country to a specific final product in a different country is challenging. The distances between the sites of production and consumption are usually long, the chains of custody are opaque and cross multiple jurisdictions, and the raw commodity in international trade may be unrecognizable by the time it gets to the market because it has been transformed in a steel mill or a textile factory or, in the case of soy, in the gut of a pig. “Greening” those chains may thus seem a quixotic quest. But the SDGs and the Paris Agreement provide a valuable foundation for action, embodying government commitments to address these challenges. And three developments offer the prospect of mobilizing the private sector and civil society to come to help grips with this challenge.

1.2.1 The Pinch Point

A first important insight is that while global value chains involve literally billions of actors – from producers to consumers – one does not have to reach or engage all of those actors in order to affect change. Each value chain has a pinch point – a relatively modest

¹² Lawson, S., Blundell, A., Cabarle, B., Basik, N., Jenkins, M., & Canby, K. (2014). *Consumer goods and deforestation: An analysis of the extent and nature of illegality in forest conversion for agriculture and timber plantations*. Washington, DC, USA: Forest Trends.

¹³ WWAP, 2012.

¹⁴ FAO. (2014). State of World Fisheries and Aquaculture. <http://www.fao.org/3/a-i3720e.pdf>.

¹⁵ IPCC. (2014). Climate Change 2014: Mitigation of Climate Change. Assessment Report 5.

¹⁶ Agnew, D. J., Pearce, J., Pramod, G., Peatman, T., Watson, R., Beddington, J. R., & Pitcher, T. J. (2009). Estimating the Worldwide Extent of Illegal Fishing. *PLoS one*, 4(2), e4570.

¹⁷ Lawson et al., 2014.

¹⁸ Lawson et al., 2014.

number of very large enterprises – traders, manufacturers, retailers – who control most of the trade.

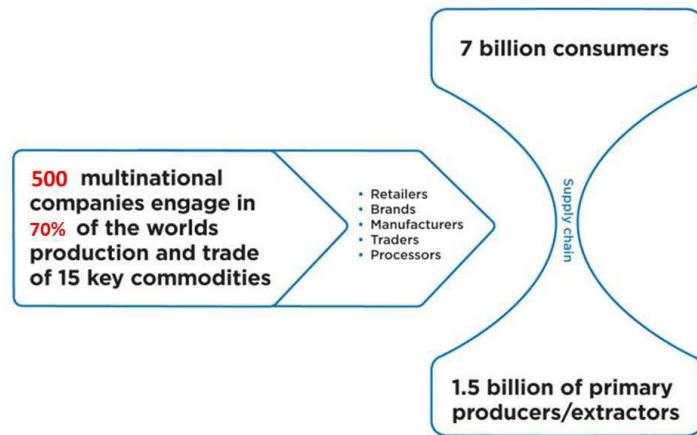
WWF analyzed the 15 commodities that are most responsible for the pressure on the Earth's resources – the principal drivers of deforestation, fisheries depletion, and greenhouse gas emissions from land use. They found that approximately 500

companies accounted for 70% of the trade in those commodities. If one can engage those companies, many of which are Chinese companies or multinationals doing business in China, one can shift entire sectors.

1.2.2 The Rising Importance of Voluntary Standards

A second breakthrough has been the proliferation of broader international collaborations, among companies, NGOs, and in some cases governments, to create voluntary sustainability standards. The Better Cotton Initiative (BCI), the Extractive Industries Transparency Initiative (EITI), FairTrade, the Forest Stewardship Council (FSC), the Marine Stewardship Council (MSC), the Roundtable for Responsible Soy (RTRS), and the Roundtable on Sustainable Palm Oil (RSPO), to name a few examples, have established standards for social responsibility or sustainability and regimes for certifying compliance. Many of these systems have been built through robust multi-stakeholder processes – the RSPO, for example, has over 3,000 members, including producers, traders, buyers, NGOs, and governments. Voluntary standards are rapidly gaining prominence in global markets. For example, 20% of global palm oil production is now certified under the RSPO standards;¹⁹ 14% of wild-caught seafood is certified under one voluntary regime or another, and that share is growing at a rate of 35% per year. UNEP has estimated that the market for certified agriculture and forest products will be \$225 billion in 2020.²⁰

Figure 1: The Pinch Point of Global Commodity Value Chains



Source: Adapted from WWF, Better Production for a Better World, 2012 based off OECD. (2014). Building Green Global Value Chains: Committed Public-Private Coalitions in Agro-Commodity Markets

¹⁹ Pan, J., & J. Forgach. (2012). Going Global, Going Green – China Investment, Trade and Environment. *China Council for International Cooperation on Environment and Development*.

http://www.iisd.org/pdf/2012/going_global_going_green.pdf.

²⁰ TEEB. (2010). The Economics of Ecosystems and Biodiversity Report for Business - Executive Summary. United Nations Environmental Program.

These initiatives show heartening potential. They also face significant challenges, including engaging small producers in developing countries and in continuing to build market share, especially in emerging economies. Many committed buyers, producers, and governments are worried that their efforts will not succeed in the long run without stronger engagement and leadership from China. In fact, as these initiatives take off, China has a singular opportunity, as the largest player in the market, to engage these efforts and to shape global value chains that provide sustained supplies of valued commodities while safeguarding the ecosystems and resources that produce them.

1.2.3 Transparency and Traceability

A third rapidly developing breakthrough is the dramatic advances in tools for transparency and traceability. We are in the midst of a data revolution that includes, advances in generation and collection of new data sources, from remote sensing to social media; new analytical tools for extracting insights and making predictions, such as machine learning and artificial intelligence; and new ways to put information in the hands of users, such as smartphone apps and RFID tags. This revolution is creating radical transparency in supply chains – illegal or unsustainable activity anywhere is visible everywhere, and in real time. It is also increasingly enabling governments, companies, and consumers to trace products from the store shelf back to the origins of each ingredient and component, monitoring behaviors and environmental impacts at every link in the value chain.

Transparency: A few examples illustrate the possibilities:

Deforestation: Brazil's success in controlling deforestation in the Amazon was made possible by its cutting edge satellite monitoring capability. Similar capability is now available to the rest of the world through WRI's Global Forest Watch, which uses satellite data to monitor deforestation and forest fires around the world. Satellite data is rapidly improving -- offering resolutions of up to 30 centimeters, for example, and new flocks of satellites that will take a picture of the entire Earth every day. Satellite data is complemented by initiatives like Eye on the Forest, in Indonesia, which use social media to allow communities to report illegal activities. Together, these capabilities provide the potential to spot deforestation as it's happening, to stop it, and to name the culprits.

Fish: Several initiatives combine data from multiple sources to monitor fishing activity. Project Eyes on the Seas, for example, combines data from radar and cameras on satellites and from transponders on boats to create highly accurate real-time maps of fishing vessel movements, and automatically alert relevant authorities to illegal activity.

Agriculture and water: Remote sensing data can increasingly be used to monitor agricultural practices, including the use of chemical inputs and extraction of water for irrigation. Satellites can also be used to monitor the status of surface water resources and even to measure and monitor groundwater reserves.

Traceability: While we are quickly gaining much greater visibility over what happens in the production of commodities, it is often difficult to trace specific products from the producer to the store shelf. Some of the certification regimes described above have established robust “chain-of-custody” systems to ensure that traceability. Data innovations are also opening up new possibilities. Some Chinese companies are already using QR codes on meat, for example, to allow customers to trace products back to individual farms. RFID tags allow a company to track individual products through their supply chains. The cost of DNA analysis has fallen so precipitously that some seafood companies are developing tools for “DNA barcoding” – a molecular-based system that allows consumers to trace the source of tuna and other large fish. Other companies are applying blockchain technology – which underlies Bitcoin and other virtual currencies – to create unforgeable digital ‘passports’ for physical products that allow businesses and customers to trace and audit the environmental, social, and economic footprint of each individual product throughout its supply chain.

This explosion in transparency and traceability creates new risks, of course – enterprises and countries will face even greater scrutiny of the activities and impacts in their global value chains. These advances also create huge new opportunities, however, for countries, enterprises, and consumers to ensure that global value chains are serving their priorities and their values, and to gain market advantage by assuring that their own products are green.

2. SIX CASE STUDIES OF GLOBAL VALUE CHAINS OF COMMODITIES

To better understand the global value chains for commodities and their implications for China, we undertook case studies of six commodities – seafood, soy, palm oil, cotton, timber, and copper. These six were chosen to represent the diverse roles that commodities play in the Chinese economy, the diverse sustainability challenges they present, and the range of solutions that are possible and, in some cases, underway. These six cases may be usefully considered in three groupings – commodities that are important to China’s food security; renewable commodities important to the economy; and non-renewable (“hard”) commodities.

2.1 Food

China has established rigorous programs to assure that it is self-sufficient in some staple crops – notably wheat and rice. Over the past two decades, however, China has become increasingly reliant on global markets to supply other commodities that are vital components of its food supply, and to buy commodities it produces. Seafood, soy and palm oil are examples.

2.1.1 Seafood

Seafood is the most important source of animal protein in China. It is also the most important component of the agricultural economy – accounting for 22% of total agricultural revenue. China is the world’s largest producer of seafood, producing 16% of wild catch, and 62% of aquaculture.²¹ China is also the world’s leading seafood exporter, supplying 14% of total trade.²²

This burgeoning industry now faces formidable natural constraints. Since 1985 global wild catch has stagnated at 80 million MT a year, with 31% of fisheries overharvested,²³ and a significant share that is illegal, unreported, or unregulated (IUU).²⁴ The World Bank estimates that this unsustainable harvest is costing the global economy US\$80 billion annually. The only way to maintain and increase production for the long term is to control overfishing now so that stocks can recover and offer a higher, sustainable yield.

Fish farming, which has been expanding at 5.5% per year over the past 20 years, offers the greatest promise in the long-term for meeting expected growth in demand for seafood in China.²⁵ Further expansion faces significant challenges, however. Most of the high quality growing areas have already been developed. Intensive and unregulated aquaculture has caused severe pollution in fresh and coastal waters. Feed relies heavily

²¹ FAO. (2016). *The State of World Fisheries and Aquaculture*. Rome.

²² FAO, 2016.

²³ FAO, 2016.

²⁴ FAO, 2016.

²⁵ World Bank. (2013). *Fish To 2030: Prospects for Fisheries and Aquaculture*. Agriculture and environmental services discussion paper no. 3. Washington, DC: World Bank Group.

on wild-capture fish and soy, both of which face sustainability issues.

If China is to establish the longer-term security of its seafood supply, it must also continue to tighten regulations to ensure that all wild catch operations are both legal and sustainable, while simultaneously seeking more efficient and environmentally sustainable methods to enable further growth of its aquaculture sector.

There are now significant international efforts to come to grips with these challenges. Several governments are taking action to control trade in illegal seafood. The EU has enacted regulations requiring that all seafood imported into the EU be from legal and reported sources. The Transpacific Partnership requires all trading partners to ensure that all seafood trade comes from legal sources. The Port State Measures Agreement, negotiated under the FAO, also imposes important safeguards against IUU fish.

Voluntary certification regimes, including the Marine Stewardship Council and Aquaculture Stewardship Council, have established international standards. Many multinational companies have committed to compliance with those standards. All fish in Filet-O-Fish sandwiches sold at McDonald's in the United States, Canada and Europe is MSC-certified. IKEA has committed to sourcing 100% of its seafood from MSC- or ASC-certified sources. More than 90% of Walmart U.S., Sam's Club and Asda's (U.K.) fresh and frozen farmed and wild seafood are certified by either MSC or the Global Aquaculture Alliance, or engaged in a fisheries improvement program.²⁶

These market requirements have fueled a 35% annual average growth rate in the adoption of voluntary sustainability standards globally over the past decade.²⁷ As of 2015, 14% of global seafood production was certified under one or another voluntary sustainability standard.²⁸ Maintaining China's competitiveness in the fish processing sector moving forward will require comprehensive and credible demonstration of compliance with international sustainability and legality requirements.

To move China's seafood sector toward sustainability there are a few urgent priorities. The first priority is implementation of a mandatory national system to assure the legality of all traded seafood products. A second priority is to subsidize a transition to compliance with internationally recognized sustainability standards – for both imported seafood and domestic production, wild-caught and farmed. Compliance would both assure stronger traceability of seafood products, and secure enhanced access to international markets. Implementation of strong standards for China's booming aquaculture sector would also help create a path for its continued expansion – curbing the eutrophication and land conversion that threaten to undermine future prospects. A third priority is to help drive long-running WTO negotiation fisheries subsidies to conclusion, to help curb subsidies that are fueling overcapacity and overfishing.

²⁶ Wal Mart. (2016). Wal Mart - Sustainable Food. <http://corporate.walmart.com/global-responsibility/environment-sustainability/sustainable-agriculture>.

²⁷ Potts, J., Wilkins, A., Lynch, M., & McFatridge, S. (2016). State of Sustainability Initiatives Review: Standards and the Blue Economy. Winnipeg: International Institute for Sustainable Development (IISD).

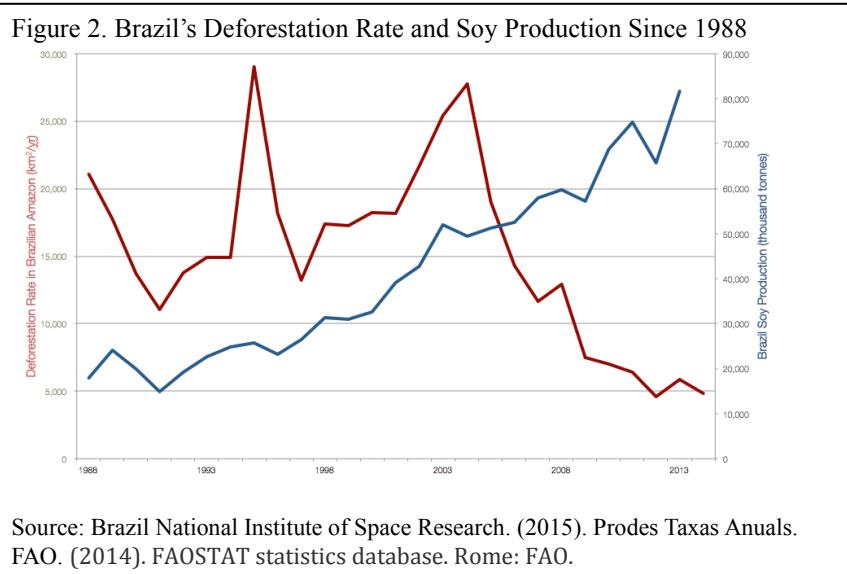
²⁸ Potts et al, 2016.

2.1.2 Soy

Over the past fifty years, global soybean production increased 15-fold to become the leading agricultural commodity in global trade; the area of soy plantations expanded from less than 30 million hectares to more than 140 million.²⁹ This expansion has caused widespread conversion of tropical forests and other natural ecosystems, resulting in significant carbon emissions, loss of biodiversity, soil erosion and social inequality in the major producer countries such as Brazil, Argentina and Paraguay.

Until very recently, China was the world's largest producer, producing 12 million tons annually. It is still the largest grower of non-GMO soy, but today China is also the largest importer of soy, purchasing 60% of the soybeans traded on the world market³⁰ – more than 80 million tons per year³¹ – to meet demand for animal feed and vegetable oil.

Food security is the most pressing issue for China previously. Chinese government has, historically, given priority to stable supply of agricultural commodities to ensure food security. Chinese and multinational companies importing soy into China have not yet seen sustainability as important to their business in the China market.



This status quo may be shifting, however, as the largest global buyers and traders of soy have made commitments to greening the global soy value chain, with a particular focus on eliminating deforestation. Altogether, more than 250 multinational companies have committed to eliminating deforestation from their supply chains. In 2006, buyers such as McDonald's and traders such as Cargill and ADM joined with growers in a moratorium on sale of soy produced from deforestation in the Amazon. In conjunction with vigorous measures by the Government of Brazil, that moratorium has helped achieve a 70% reduction in deforestation in the Brazilian Amazon over the past 12 years³², while

²⁹ WWF. (2014). The Growth of Soy: Impacts and Solutions. WWF International, Gland, Switzerland.

³⁰ The Observatory of Economic Complexity. (2014). Which Countries Import Soybeans? http://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/show/all/1201/2014/.

³¹ USDA-FAS. (2 November 2016). China: Oilseeds and Products Update. <http://www.fas.usda.gov/data/china-oilseeds-and-products-update-13>.

³² Howard, B. (5 June 2014). Brazil Leads World in Reducing Carbon Emissions by Slashing Deforestation.

supporting a 60% increase in soy production in the region. See Figure 2.

The international conservation community has been working hard with governments and farmers in Brazil and other South American countries to build on this success and reduce conversion of natural habitats across the continent. Farm level certification schemes such as the Round Table for Responsible Soy and jurisdictional sustainability approaches have been developed to increase the sustainability of soy plantations.

Joining global efforts on soy would strengthen China's reputation on the international stage, its relations with producing countries, and the competitiveness of Chinese companies in the global market. It would also reduce China's contribution to climate change – deforestation from expansion of soy and other major commodities accounts for more than 10% of global emissions.³³

Strong laws now in place, such as the Forest Code in Brazil and measures expected in other jurisdictions, mean that it is now possible for China to forge Sustainable Sourcing Agreements that improve the sustainability of its imports while still securing adequate volume. Sustainable Sourcing Agreements with China's most important trading partners – either national governments or key states – would allow China to achieve this win-win. Chinese government should then also provide development assistance to key producing countries and states to help them implement programs to ensure supply of large quantities of soy with credible verification of sustainability.

2.1.3 Palm oil

In recent decades, palm oil has become the world's leading vegetable oil, used not just as cooking oil but as an ingredient in a wide range of products, from cup noodles to ice cream to lipstick.³⁴ To meet this global demand, palm oil production has expanded from just 2 million metric tons in 1980 to more than 56 million metric tons in 2013.³⁵ Half of global production is in Indonesia and another third in Malaysia, but palm oil is also expanding rapidly in Central and West Africa, and in parts of Latin America. China is the second largest buyer of palm oil in the international market, importing 10% of total global production.³⁶

<http://news.nationalgeographic.com/news/2014/06/140605-brazil-deforestation-carbon-emissions-environment/>

³³ Schaap, B. & Thiel, A. (11 December 2015). The Paris REDD+ Roller Coaster. <http://forest-trends.org/blog/2015/12/11/the-paris-redd-roller-coaster/>.

³⁴ Byerlee, D., Falcon, W., & R. Naylor. (2016). The Tropical Oil Crop Revolution: Food, Feed, Fuel, and Forests. Oxford University Press.

³⁵ FAOSTAT. (n.d.) Production of Palm Oil, World. [Data file]. Food and Agriculture Organization of the United Nations – Statistics Division. Retrieved August 30, 2016 from <http://faostat3.fao.org/>.

³⁶ FAOSTAT, 2016.

Oil palm is a very efficient source of vegetable oil, yielding four times as much oil per hectare as other oil crops. The rapid expansion of oil palm plantations has been a major driver of deforestation, however. In 2015, more than 120,000 fires swept across the Indonesian islands of Borneo and Sumatra, burning forests and peatlands that had been dried out by palm oil and pulp plantations. The World Bank estimated that the fires caused a 2% decline in Indonesia's GDP.³⁷ A recent study estimated they caused nearly 100,000 deaths.³⁸ The fires also produced massive greenhouse gas emissions, exceeding the annual emissions of Japan and Russia. Indeed, on many days in September and October 2015, the emissions from the fires exceeded the total daily emissions of China.³⁹

The Roundtable on Sustainable Palm Oil has established principles and standards for sustainable production; 20% of palm oil produced today is certified under those standards.⁴⁰ Forty-four Chinese companies have joined RSPO, but none has yet committed to full implementation of its standards.⁴¹ In recent years, the largest international, Indonesian and Malaysian companies that grow, trade and buy palm oil – accounting for more than 60% of the global market – have made broader commitments to “no deforestation.” The Government of Indonesia has also announced a moratorium on further clearing. The support of China and Chinese companies will be decisive.

The China Chamber of Commerce of Foodstuffs and Native Produce (CFNA) has called for action: “For Chinese enterprises involved with palm oil, the coming five years will be a critical period for the development of a robust sustainability approach that will offer better guarantees for the future stability of the palm oil sector and its contributions to food security, economic prosperity and global environmental improvement.”⁴² In the near-term, a clear signal from the government encouraging companies to demand deforestation-free supplies, and to begin developing national guidelines on sustainability would set change in motion. In the longer term, the government should use procurement requirements and preferential tariffs to incentivize a shift to sustainable palm oil, and use its development assistance to help producing regions implement sustainable production.

³⁷ Glauber, A. J., & Gunawan, I. (2016). *The Cost of Fire: An Economic Analysis of Indonesia's 2015 Fire Crisis*. The World Bank Group: Jakarta, Indonesia.

³⁸ Koplitz, S. N., Mickley, L. J., Marlier, M. E., Buonocore, J. J., Kim, P. S., Liu, T., ... & Pongsiri, M. (2016). Public health impacts of the severe haze in Equatorial Asia in September–October 2015: demonstration of a new framework for informing fire management strategies to reduce downwind smoke exposure. *Environmental Research Letters*, 11(9), 094023

³⁹ Morales, A. (October 28, 2015). *How Indonesia's Fires Made it the Biggest Climate Polluter*. Bloomberg News. <http://www.bloomberg.com/news/articles/2015-10-28/how-indonesia-s-fires-made-it-the-biggest-climate-polluter>.

⁴⁰ Roundtable on Sustainable Palm Oil. (31 July 2016). *Impacts*. <http://www.rspo.org/about/impacts>.

⁴¹ RSPO. (1 December 2015). *China & Sustainable Palm Oil: From Challenge to Partner*. <http://www.rspo.org/news-and-events/news/china-and-sustainable-palm-oil-from-challenge-to-partner>.

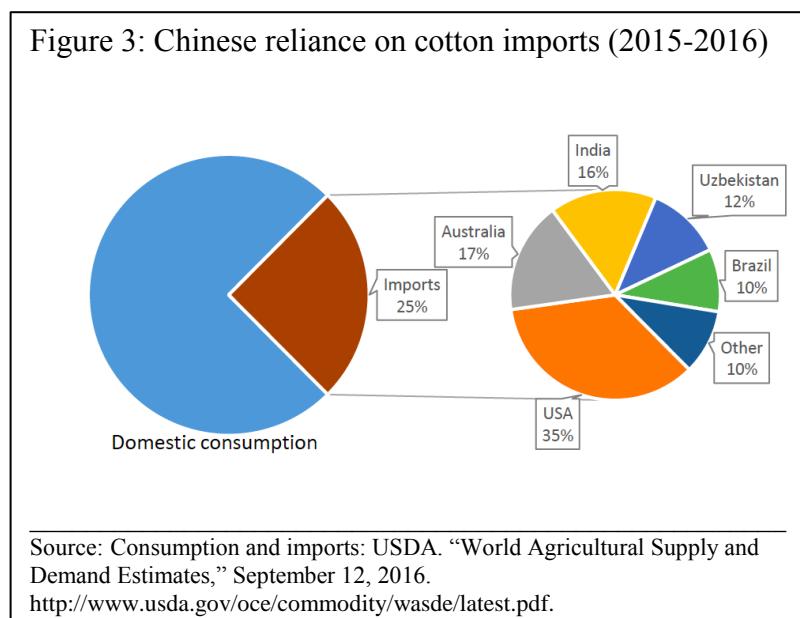
⁴² CFNA & Defra. (2011). *Prospects and challenges of sustainable palm oil for China*. Beijing: China Chamber of Commerce for Imp. and Exp. of Foodstuffs, Native Produce and Animal By-Products.

2.2 Commodities of economic importance

Soft commodities are also an important input to China's economy. As just noted, China is the world's leading processor and exporter of seafood. Cotton and forest products also are vital inputs to important industries.

2.2.1 Cotton

China's textile industry is the largest in the world, producing 30% of global output.⁴³ It is a significant export industry – 40-45% of production is for export⁴⁴ – and a significant employer, accounting for 10% of industrial employment in the country.⁴⁵



Cotton is a mainstay of that industry. China has long been the largest source of cotton, although it has recently been overtaken by India, and cotton growing is the main source of income for more than 7 million farmers across the country. China is also a significant importer, sourcing cotton from the US, Australia, India, Uzbekistan and Brazil.

Cotton cultivation relies heavily on inputs – both

chemicals (pesticides and fertilizers), and water. Although cotton is grown on only 2-3% of the world's arable land, it accounts for 14% of global insecticide use,⁴⁶ it is China's most chemical-reliant crop, accounting for 25-30% of all pesticide use in the country.⁴⁷ More than 90% of farmers in China now use Bt cotton⁴⁸ (a GMO), which reduces dependence on pesticides, but there are indications that pest resistance to Bt cotton is

⁴³ USDA. (2016). Annual Economic Outlook for Cotton. <http://www.cotton.org/econ/reports/annual-outlook.cfm>.

⁴⁵ Macdonald, 2015; Macdonald, S., Gale, F. & Hansen, J. (2015) Cotton Policy in China. USDA.

⁴⁴ Estimates based on Chinese National Bureau of Statistics, FAO International Cotton Advisory Committee's World Apparel Consumption Survey and World Trade Organization export data.⁴⁵

⁴⁵ Macdonald, 2015.

⁴⁶ FAO AQUASTAT. (2014). Irrigated Crops. http://www.fao.org/nr/water/aquastat/infographics/Irrigated_eng.pdf.

⁴⁷ Wu, K.M., Guo, Y.Y., (2005). The evolution of cotton pest management practices in China. Annu. Rev. Entomol. 50, 31–52.Xiao, J., Zhao, J.B., 2005. Farmland plastic.

⁴⁸ ISAAA. (2015). ISAAA Brief 49-2014: Executive Summary.

<http://www.isaaa.org/resources/publications/briefs/49/executesummary/default.asp>; Pan, J., Chu, C., Zhao, X., Cui, Y.,

Voituriez, T. (2008). Global Cotton and Textile Product Chains Identifying challenges and opportunities for China through a global commodity chain sustainability analysis. Winnipeg: IISD and MOFCOM.

increasing, giving rise to doubts about long-term effectiveness.

Cotton tends to be grown in regions, like Xinjiang Province, that are hot and dry, so cultivation typically depends on intensive irrigation. Use of water to grow cotton has been a major cause of water scarcity. Most notoriously, cotton farming drained the Aral Sea, which shrunk from 200,000 km² in 1920 to 50,000 km² in 2005.⁴⁹ In Xinjiang, irrigation caused a 4-6 m drop in groundwater levels in the Tarim River Basin between 1960 and 1980, and the lower reaches of the Tarim River have run dry.⁵⁰ Many of the world's major producing regions – in China, India, Australia, Uzbekistan, and Mali – face growing water scarcity.

Soil pollution is also a looming challenge. Heavy use of pesticides and fertilizer contaminates soils. Intensive irrigation leads to salinization – it is estimated that soil salinity affects one-third of the irrigated cropland in Xinjiang, for example.

Acute water scarcity and the depletion and contamination of soils pose fundamental threats to the long-term viability of the cotton sector. Recognizing these challenges, there is now a significant NGO and private sector movement to implement voluntary sustainability standards for cotton. Several of the world's largest buyers, including Levi Strauss, Adidas, H&M, Ikea, and Nike, have committed to sourcing sustainable cotton. Market share for certified sustainable cotton is growing very fast. The leading standard is the Better Cotton Initiative, which focuses particularly on reducing reliance on inputs and thus has been able to reduce impacts while also increasing income for farmers. From 2012 to 2015, Better Cotton expanded its market share 56% per year.⁵¹ It now has 11.9% of the global market, and aims to reach 30% by 2020.⁵² It is reasonable to project that these international standards will soon become accepted international norms, and the price of entry to the global market.

China has taken various measures to improve the sustainability of domestic production, through subsidy programs, for example. But embracing international standards will be vital to China's interests in two ways – in helping it ensure the continued viability of suppliers overseas; and in maintaining its competitive position in the global market for textiles by assuring export customers that its textiles are made with cotton that meets international expectations. First priorities are to translate international standards to the local conditions of Xinjiang, and provide subsidies and technical support to help farmers come into compliance. Preferential tariffs for certified sustainable cotton could also help Chinese textile producers shift their purchasing. Through these steps, China can set its industries on a path that assures the long-term sustainability of the textile and cotton sectors, and a continue leadership position in export markets.

⁴⁹ Kooistra, K.J., Pyburn, R., Termorshuizen, A.J. (2006). *The Sustainability of Cotton: Consequences for Man and Environment*, Science Shop Wageningen University & Research Centre. Report 223.

⁵⁰ Soil salinity impacts about one-third of the total irrigated cropland in Xinjiang. See Zhao, X., Wu, P., Gao, X., & Persaud, N. (2015). Soil quality indicators in relation to land use and topography in a small catchment on the Loess Plateau of China. *Land Degradation & Development*, 26(1), 54-61.

⁵¹ Better Cotton Initiative. (2016). *2015 at a Glance* <http://bciannualreport.org/2015-at-a-glance.html>.

⁵² Better Cotton Initiative. (2015). *Better Cotton Initiative Annual Report 2015*. Geneva: Switzerland.

2.2.2 Forest products

Unsustainable logging and pulp plantations are important drivers of deforestation and degradation.⁵³ Global trade of forest products reached \$492 billion in 2015.⁵⁴ It is estimated that 10-30% of this comes from illegal logging.⁵⁵ The World Bank and INTERPOL calculate that illegal logging is costing countries at least \$10 billion per year with loss of tax income and revenue.⁵⁶

China is the largest player in global forest products value chains, accounting for one third of global export and import in 2015, amounting to 4% of China's overall trade, up from 2% in 2005.⁵⁷ China imports forest products in mostly unprocessed forms (e.g., pulp, industrial logs, lumber, waste paper, etc.) and exports them mostly as furniture and paper to developed countries. China has also become a leading investor in forestry globally, with 61 million hectares of forests concessions in 20 countries.

The improvements made in the sustainability of the global forest products sector owe much to both private and public innovations. In the early 1990s, a group of environmental organizations and retailers created the Forestry Stewardship Council to establish standards and systems to certify forest land owners and companies who comply with its sustainability principles and performance based metrics – awarding “carrots” rather than the “sticks” of traditional boycotting campaigns. As of June 2016, FSC certified forests are found in 81 countries, covering over 190 million hectares. FSC has awarded 30,588 chain-of-custody certificates in 118 countries.⁵⁸ Currently, 14% of timber products and 55% of pulp and paper (recycled) is FSC certified.⁵⁹ Together FSC and the Programme for the Endorsement of Forest Certification (PEFC) certify over 10% of world's forest.⁶⁰

Some major importing countries have also established legislation to curb the flow of illegal timber. In 2003, the EU created the Forest Law Enforcement Governance and Trade program, which provides for Voluntary Partnership Agreements between the EU and timber-producing countries to support their efforts to combat illegal harvesting. The EU Timber Regulation (EUTR), in effect since 2013, prohibits illegally harvested timber

⁵³ WWF and IIASA. (2015). Chapter 5 Saving Forests at Risk in WWF Living Forest Report. The World Wide Fund for Nature, Gland, Switzerland.

⁵⁴ FAO defines forest products to include timber produced on the basis of forest resources and other products using timber as raw material. The term primarily refers to logs, lumber, wood-based panel, finished and semi-finished wooden products, wood pulp, paper and paper products that use wood as raw material.

⁵⁵ Hoare, A. (2015). Tracking illegal logging and related trade: what progress and where the next. Chatham House, UK.

⁵⁶ INTERPOL/World Bank. (2009). Chainsaw Project: An INTERPOL perspective on law enforcement in illegal logging. INTERPOL General Secretariat, Lyon.

⁵⁷ Chen, S. (2016). Chinese Forest Products International Trade Policies under Global Context (“全球市场背景下的中国林产品贸易对策”). Presentation at State Forestry Administration Center for Global Forestry Products Trade Research Annual Conference and Forestry Sector Green Investment International Seminar.

⁵⁸ FSC. (2016). Facts & Figures. Forest Stewardship Council. <https://ic.fsc.org/en/facts-figures>.

⁵⁹ FSC, 2016.

⁶⁰ UNECE. (2015). *Forest Products – Annual Market Review 2014-2015*. United Nations Economic Commission for Europe.

and products derived from such timber in EU markets.⁶¹ The U.S. and Australia have enacted similar requirements.

The Chinese government and relevant stakeholders have also experimented with an evolving range of tools. Starting around 2006, a unique multi-stakeholder FSC National Initiative, convened by SFA, drafted a localized and also internationally competitive standard. As of June 2016, China has 892,508 hectares of FSC certified forests and 4,472 companies chain-of-custody certified.⁶² Companies involved in the production, use and sale of FSC products include both multinational business like Wal-Mart, Tetra Pak, IKEA and Kimberly Clark and leading Chinese businesses such as Vanke, Jilin, Heilongjiang Forest Industry Group, Sun Paper Group, Yi Hua Timber and An Xin Floors. Seven out of China's top ten paper manufacturers are FSC certified.⁶³

China collaborated with the UK government to pilot the *Chinese Timber Legality Verification System (TLVS)* since 2009 with a two-pronged strategy. SFA entrusted the China National Forest Products Industry Association (CNFPIA) with the development of responsible purchasing and due diligence policies for a voluntary legal timber verification system, based on international experience. The pilot also aims to foster direct bilateral agreement with timber exporting countries on standards to identify legal products. Under the APEC framework, China has called on countries to establish a mechanism to mutually recognize their legality verification system.

To address issues in China's overseas direct investment, SFA issued the Guideline for Sustainable Forestry Management and Utilization for Chinese Overseas Enterprises in 2007 and has been drafting the Guideline for Sustainable Trade of Forest Products and Investment for Chinese Overseas Enterprises since 2013. But the implementation of the guidelines by companies overseas remains a question.

The most important step the Chinese government could take to improve the sustainability of the forest products value chain would be to accelerate implementation of the national legality verification system, to stop illegal trade and enable domestic policies such as green public procurement. It can tap into the green credit system to support sustainable and responsible forest companies in both domestic and overseas concessions. SFA should strengthen training and guidance to companies to enhance their compliance with legal requirements. The government could also support expansion of Chinese companies' participation in FSC and other private sector initiatives aimed at building sustainable supply chains.

⁶¹ Due diligence is when traders perform a risk management exercise to minimize chances of supplying illegal timber.

⁶² FSC. (2016). Home Page. <https://cn.fsc.org/cn-cn>

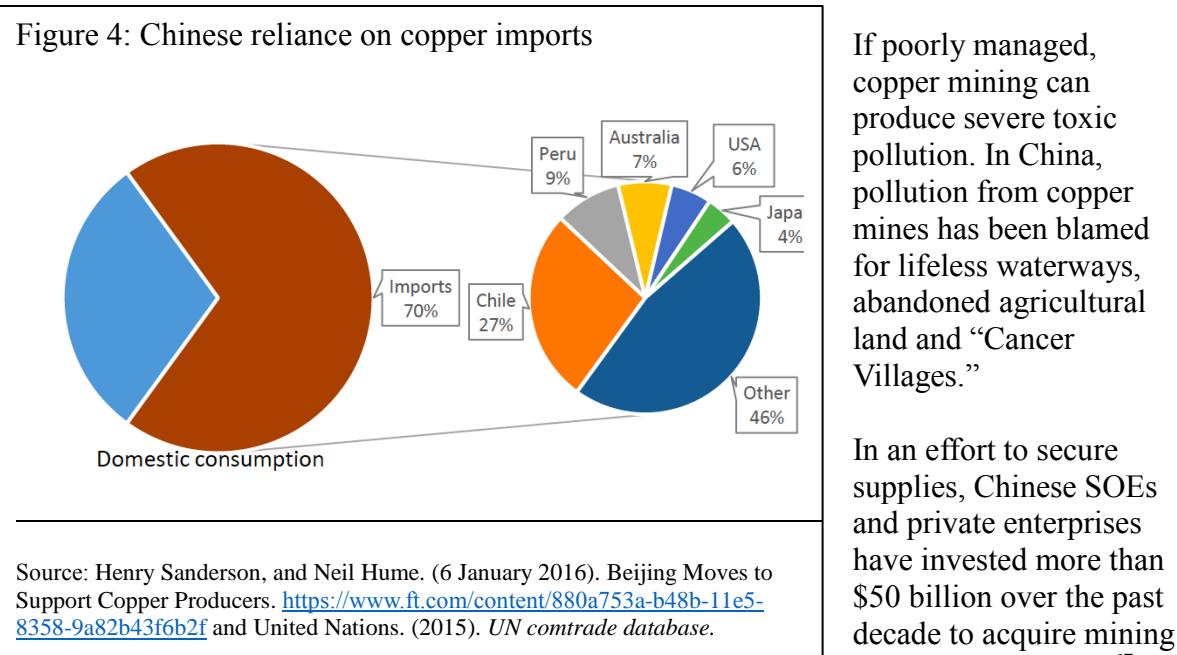
⁶³ FSC. (2012). *Future is bright for FSC certification in China thanks to productive relationship with Chinese authorities.* <https://ic.fsc.org/en/news/national-news/id/161>.

2.3 Hard commodities

In this study, we focused principally on “soft” commodities which pose sustainability challenges that are both significant and often ignored. But China also depends vitally on imports of “hard” commodities, including fossil fuels, of course, and also minerals like iron and copper. We considered the case of copper.

2.3.1 Copper

Copper is an essential input into the global economy, and China is both the largest producer and the largest consumer. Although China has only 4% of the world’s copper reserves, it accounts for 11% of the world’s production.⁶⁴ While much of China’s copper use is for export products, domestic consumption is expected to be the major driver of future demand, projected to grow from 5.4 kg/yr to 11 kg/yr over the next 20 years.⁶⁵ China already depends on imports for two-thirds of its supply.⁶⁶



If poorly managed, copper mining can produce severe toxic pollution. In China, pollution from copper mines has been blamed for lifeless waterways, abandoned agricultural land and “Cancer Villages.”

In an effort to secure supplies, Chinese SOEs and private enterprises have invested more than \$50 billion over the past decade to acquire mining operations overseas.⁶⁷ In

many cases, these operations have run into conflicts with local communities, unhappy

⁶⁴ Potts, J., Huppé, G. A., Dion, J., Voora, V., and Forstater, M. (2014). *Meeting China’s Global Resource Needs Managing Sustainability Impacts to Ensure Security of Supply, The IISD Supply Risk Tool Methodology*. Winnipeg, Canada: International Institute for Sustainable Development. <http://www.iisd.org/library/meeting-chinas-global-resource-needs-managing-sustainability-methodology>.

⁶⁵ Potts et al., 2014.

⁶⁶ Potts et al., 2014.

⁶⁷ In the first six months of 2011, Chinese entities announced 75 acquisitions in the global mining sector worth \$4.7 billion, according to PricewaterhouseCoopers (PwC). Citibank, on the other hand, has reported 217 mergers and acquisitions involving Chinese companies since 2003, with a market value of \$50 billion. See Kirschke, J. (16 September 2013). Engineering & Mining Journal News. Engineering and Mining Journal. <http://www.emj.com/features/3263-the-dragons-enter-chinese-mining-companies-shake-the-world-of-sustainability.html#.V8xf2U197IV>.

with environmental and social protections. In Peru, for example, the government sanctioned Chinalco Mining for toxic pollution, and the company had to shut down its Toromocha mine; local opposition forced Zijn to suspend its Rio Blanco copper project; and three people were killed and 17 wounded in clashes between farmers and police around a \$7.4 billion China Minmetals project in the highlands. In Myanmar, Wanbao Mining Copper has faced contentious protests at its Letpadaung Mine since 2011. In Zambia, the government has banned China's Nonferrous Mining Corporation from running a \$832 million project because of environmental and labor violations.

Inadequate environmental and social performance in the operations of Chinese companies have thus translated directly into cancellation of those companies' social licenses to operate. They also pose a broader threat – by damaging China's reputation as a trade and investment partner, these problems threaten to undermine China's ability to continue to get access to the copper resources that will become increasingly important to its industries and consumers, and also to undermine China's access to export markets, which are increasingly demanding products that are made with sustainably sourced inputs.

There are two clear remedies to these problems. First, international guidelines for more responsible mining – such as the Extractive Industries Transparency Initiative, the Equator Principles, and the Intergovernmental Forum on Mining and Minerals – provide accepted benchmarks for performance. Through active engagement in these fora and rigorous implementation of their standards, China could play a key role in shaping the future of the sector and at the same time secure its position and the position of its companies as responsible producers. China could start by establishing incentives for compliance with the China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters (CCCMC) "Social Responsibility Guidelines for China's Overseas Mining Investment." Through Sustainable Mining Partnerships with its most important copper trading partners – Chile, Peru, Mexico and Myanmar – China could also assure both the sustainability and security of supply from those partners.

Second, copper can be recycled. China is already a leader – recycling provides about 30% of China's current supply.⁶⁸ Increasing the recycling of copper stocks requires international cooperation in ensuring that products are designed to facilitate recycling and that discarded products are collected. China could and should take the lead in launching an international platform to promote enhanced copper recycling efficiency.

3. CHINA'S PRIORITIES AND GLOBAL VALUE CHAINS

As noted above, production of commodities poses significant sustainability challenges.

⁶⁸ Risopatron, Carlos R. (12 April 2013). Copper and Copper Alloy Scrap Use and Trade in China and the Rest of the World. 2013 ISRI Convention. <http://www.eisourcebook.org/cms/July%202013/China,%20Copperalloy%20Scrap-use%20&%20Trade%20in%20China%20&%20Globally.pdf>.

These issues thus lie at the heart of China’s quest for an Ecological Civilization. In this section, we review the evolution of China’s economy and priorities, and then outline why greening global value chains are important to the long-term security of China’s access to the resources that it needs, and more broadly for China’s role in the world – its partnerships, especially across the South; its “brand”; and its success in reshaping global governance and commerce.

3.1 Context – The Evolution China’s Economy and Priorities

3.1.1 The Evolution of China’s Economy

Starting in the late 1970s, China focused its Reform and Opening policies on realizing rapid industrialization and market reforms guided by heavy state investment and labor-intensive export manufacturing. This approach delivered double-digit annual GDP growth for nearly four decades, pulled over 700 million people out of poverty, and transformed China into a middle income country, but it also brought severe pollution, growing income inequalities and structural imbalances between supply and demand. Now China is moving into a new stage of development, with a greater emphasis on consumption and innovation as drivers of growth and a more decisive role for the market in allocating resources.

China’s leadership continues to stress reform and opening, but with some important differences from the past. Instead of focusing solely on the rate of growth, economic policies now seek to enhance the *quality* of development by increasing personal incomes, broadening the social safety net and providing equal rights and equal opportunities for all. The economic structure will shift to reduce the role of heavy industry and exports of resource-intensive products; growth will be driven increasingly by services and domestic consumption. The new style of industrialization is intended to be green, innovative and high-tech. With guidance from markets, the government has set out to push structural reform on the supply side, including elimination of over-capacity in the economy and support to development of strong, efficient new industries.

3.1.2 New Priorities

A crucial aspect of China’s new development direction is a commitment to building an Ecological Civilization. Western countries addressed the environmental effects of industrialization only after growing rich, and did so in large part by moving polluting industries to developing countries. China’s leaders are rejecting this path, and expressing a commitment now to sustainable development.

Ecological Civilization emphasizes resource-efficient growth, conservation of the environment, and the harmony of people and nature. It entails a different way of planning and evaluating development that balances GDP growth against environmental impacts. And as its name implies, Ecological Civilization doesn’t isolate environmental protection as a sector, but is an over-arching philosophy guiding China’s economic, social and cultural development and its engagement in improvement of the global governance system.

Meeting China's goals of doubling its 2010 GDP by 2020 while building an Ecological Civilization is a daunting challenge, requiring a re-structuring not just of China's domestic economy but also of its external economic relations. The Belt and Road Initiative (BRI), is a critical platform for this transformation. BRI is a new approach to regional cooperation that goes much deeper than conventional free trade agreements. Because it integrates free trade, financial harmonization, overseas direct investment and capacity cooperation, BRI will transform and strengthen connectivity among the European, African and Asian continents and the oceans between them, improving global and regional governance models and finding new growth triggers.

Global value chains are central to BRI. As the leading economic power along the Belt and Road, China is committed to an approach based on shared benefits and common prosperity, so that China can address its over-capacity issues but not upgrade its own economy by down-grading others. In other words, BRI sets out to establish global value chains that embody an optimized international division of labor, developed in a way that creates and builds value at every step along the chain from primary production to manufacturing to distribution, marketing and even disposal, recycling or re-use. It has the potential to be a win-win solution.

3.2 The Importance of Green Global Value Chains to China's Priorities

Through the work we have done in the Study, we have concluded that assuring the sustainability of China's global value chains, including in particular the value chains for commodities, will be critical to China's priorities, both for its own development and for its engagement with the world.

3.2.1 Greening Global Value Chains is essential to securing the resources China needs

The most pressing reason for China to take action on global value chains is that its economic future depends on access to raw material imports. Because it has limited arable land and is already exploiting its domestic resource base with high social and environmental costs, China has increased imports to ensure a steady and growing supply of agricultural and mineral commodities from abroad as its economy has grown. In the 1990s, China's natural forest base was nearly exhausted from over-harvesting and its domestic soy production was unable cost-effectively to keep up with rapidly growing demand for meat. In response, the government removed trade barriers and imports soared. This trend continued with China's accession to the World Trade Organization (WTO) in 2001 and today – with the exception of a few strategic grain crops – China is fully integrated into the global trading system as a major importer of raw materials.

The downside of this deepening participation in the global economy is a growing dependence on value chains that begin outside of the country. Table 1 (below) shows the degree to which China depends on imports to meet domestic demand for many important raw materials:

Table 1: Chinese consumption met by commodity imports

COMMODITY	CONSUMPTION MET BY IMPORTS	
Palm Oil	99% ⁶⁹	in 2014/2015
Soybean	90% ⁷⁰	in 2014/2015
Seafood	19-22% ⁷¹	in 2013
Cotton	25% ⁷²	in 2014/2015
Rubber	74% ⁷³	in 2011
Wood Fiber	36% ^{74,75}	in 2014
Copper	70% ⁷⁶	in 2016
Iron	79% ⁷⁷	in 2014

While it makes sense economically to buy from other countries those commodities that would be more expensive to produce inside China, this approach also leaves the country vulnerable in the face of unstable global markets and geopolitics. Many of the commodities for which China depends on imports are vital to the country's economic development (e.g., copper and other minerals) or food security (e.g., soy, palm oil). The Going Out policy has helped China address this vulnerability, moving China beyond being just a buyer on global markets to become a leader in global investment, much of which is geared toward securing commodity supply lines against such unpredictable market and political forces.

⁶⁹ USDA. (n.d.). PSD Online – Custom Query. <http://apps.fas.usda.gov/psdonline/psdquery.aspx>.

⁷⁰ USDA. (12 September 2016). World Agricultural Supply and Demand Estimates. <http://www.usda.gov/oce/commodity/wasde/latest.pdf>.

⁷¹ FAO-FIAS. (n.d.) Food balance sheet of fish and fishery products in live weight and fish contribution to protein supply. https://ftp.fao.org/FI/STAT/summary/FBS_bycontinent.pdf.

⁷² USDA. (12 September 2016). World Agricultural Supply and Demand Estimates. <http://www.usda.gov/oce/commodity/wasde/latest.pdf>.

⁷³ FAOSTAT. (2012). Rome, Italy: FAO. <http://faostat3.fao.org/home/E>.

⁷⁴ GVMI. (2 March, 2016). Opinion: How Will China's Hunger for Wood Be Satisfied in the Upcoming Years? *Global Wood Markets Info*. <https://www.globalwoodmarketsinfo.com/china-wood-consumption-logging-bans/>

⁷⁵ RISI. (n.d.) China's Timber and Forest Products Imports Expected to Increase by 60 Million Cubic Meters by 2025. *RISI – Objective Insights*. <http://www.risiinfo.com/press-release/chinas-timber-and-forest-products-imports-expected-to-increase-by-60-million-cubic-meters-by-2025/>.

⁷⁶ Sanderson, H. & Hume, N. (6 January, 2016). Beijing Moves to Support Copper Producers. *The Financial Times*. <https://www.ft.com/content/880a753a-b48b-11e5-8358-9a82b43f6b2f>.

⁷⁷ Chen, W., Lei Y., and Jiang, Y. (2016). Influencing Factors Analysis of China's Iron Import Price: Based on Quantile Regression Model. *Resources Policy* 4(8): 68–76.

3.2.2 *The risk of resource scarcity*

But is overseas investment enough to guarantee that China will always have access to the raw materials it needs and realize its resource security? Our research suggests that it is not.

China's leaders have recognized the dangers of environmental degradation *inside* the country, and taken steps to protect natural systems from pollution and over-exploitation. Our findings suggest, however, that long-term access to many vital resources also depends on how sustainably the resources are managed *outside* of China. Much of the environmental damage described above that is currently occurring in source countries is tied to land use conversion and resource extraction for export to big importing countries including China.

Such unsustainable practices are degrading the ecosystems that support key supplies, or in the case of overfishing, threatening to wipe out those supplies entirely. Long-term access to commodities vital for China's future rests on the sustainable management of resources like forests, fisheries and farmland in source countries. The single most important action China can take toward this end is to green its global value chains.⁷⁸

3.2.3 *The risk of losing social licenses to operate*

The risk to China's long-term supplies of vital resources is not only a matter of total resource exhaustion through activities such as overfishing, however. Just as important is the geopolitical and social context of international commerce, and the prospect that Chinese companies could lose their "social license to operate" in key markets. Chinese companies that invest in unfamiliar political and social environments abroad carry a high level of risk, and that risk is exacerbated if they are insensitive to the effects of their operations on the land and people of the host country. This is true even if the project is supported by the local government. In Zambia, Myanmar, Ecuador, Honduras, Peru and other countries, there have been public protests against Chinese investment projects over employment, safety and environmental issues; the copper case study, above, cites several examples.⁷⁹ Social backlash has forced investors to postpone or cancel projects, or source country governments to close or restrict operations.⁸⁰

⁷⁸ Potts, J., Huppé, G. A., Dion, J., Voora, V., & Forstater, M. (2014). *Meeting China's Global Resource Needs Managing Sustainability Impacts to Ensure Security of Supply: The IISD Supply Risk Tool Methodology*. Winnipeg, Canada: International Institute of Sustainable Development.

⁷⁹ Kaiman, J. (25 February 2016). Peru has copper. China wants it. And now Beto Chahuayllo is dead. *Los Angeles Times*. <http://www.latimes.com/world/mexico-americas/la-fg-peru-china-mining-20160224-story.html>

⁸⁰ Mataka, K. & Wangwe, M. (25 October 2015). China Copper Mines closes down. *The Post*. <http://www.postzambia.com/news.php?id=12641>.

3.3 Greening Global Value Chains is Important to China's Future Competitiveness

3.3.1 *China's "Brand"*

China's long-term success in global value chains – its ability to source the commodities it needs, and to sell the commodities or products it produces – will also depend on its reputation, its national “brand.” If

Chinese companies are seen – by producing country governments and their citizens, or by consumers – as flouting the law or causing undue environmental or social harm, that perception undermines the political legitimacy of China's trade and investment relationships. The milk contamination scandal of 2008 is a vivid reminder that those

perceptions persist.⁸¹ This is the political danger of thinking narrowly about trade and investment, instead of sustainability and value chains.

LASTING IMPACT – THE MILK SCANDAL:
In 2008, infant formula tainted with melamine sickened nearly 300,000 babies; six died. The scandal rocked China's dairy industry, and it has not recovered. Many countries stopped importing baby foods containing milk from China. Foreign brands' share of the market went from 30% before the crisis to over half. Imports of milk powder jumped from 40,000 tonnes to 120,000 from 2008 to 2014. (See end note for reference).

China's recent action on ivory trade indicates the government's recognition of these risks – and of the surpassing importance of safeguarding China's reputation. Ivory carving has long been upheld as a protected national cultural heritage in China. UN monitoring data, however, indicated that China's market for ivory was a major contributor to the poaching crisis that has caused a precipitous decline in elephant populations across Africa. Seeing the global concern over the poaching crisis, the Chinese government has taken bold steps to curb the trade – in May 2016, the government announced that it would phase out all commercial processing and sale of ivory products.⁸²

⁸¹ Lu Li. & Liu, X. (2014). How will Chinese milk powder rebuild Consumer Confidence in face of Foreign Milk Powder's Advance. *China Milk and Cow* 8: 3-7. For more on the competition, see Horney, L. (2014). China clamps down on baby formula imports. *Financial Times*. <https://www.ft.com/content/eb09d3d2-d41e-11e3-a122-00144feabdc0> and Sun, C. (2015). Foreign firms boosted by China's new law on baby formula. *South China Morning Post*. <http://www.scmp.com/news/china/money-wealth/article/1895908/foreign-firms-boosted-chinas-new-law-baby-formula>.

⁸² Xu, Y.; Xiao, Y.; Guan, J. and Lau, W. (2016). An Act to Save African Elephants: A Ban on Commercial Ivory Trade in China, A Feasibility Study Briefing. WWF and TRAFFIC, Beijing, China.

⁸⁵ Zadek, S., Forstater, M., and Yu, K. (Mar, 2012). *Corporate Responsibility and Sustainable Economic Development in China: Implications for Business*. U.S. Chamber of Commerce.

3.3.2 China's Competitiveness

Conversely, if China can green its global commodity value chains, it will also strengthen the reputation and competitiveness of Chinese firms in global markets. Consumers in Japan, Europe and North America have a growing preference for green and healthy products. And, as incomes rise in China, domestic consumers are also increasingly clamoring for products that are safe, healthy and green. International surveys indicate that consumers in China already express a much greater concern for companies' social and environmental performance than consumers in other countries.⁸³ In a recent Accenture survey of 30,000 consumers across 20 countries, 44% of Chinese consumers surveyed said they "actively look for information on product sustainability," compared to only 13% in Germany and 14% in the U.S. Working mothers are especially vocal – 90% of working mothers surveyed in China said "they actively recommend ethical, sustainable brands."⁸⁴

GREENER CONSUMERS: Chinese e-commerce giant Alibaba reported that in 2015, 65 million people, or 16.2% of its active users, purchased more than 5 categories of green products from its site. This is up from 4.3 million people in 2011, a 14-fold increase over a four-year period.

Source: Ali Research ("阿里研究院"里. (2016). China's Green Consumers Report ("中国绿色消费者报告").

Most major multinational corporations have made sustainability commitments. Some Chinese companies have begun to address these issues. As noted in the cases, many processors of seafood and wood products have obtained international sustainability certifications to secure their access to Western markets. COFCO, China's largest commodity trader, has published traceability guidelines and standards recently and has taken initial steps by joining international initiatives to source sustainable soy and palm oil. But most Chinese firms have yet to make firm commitments to sustainability. By failing to do so, they risk losing ground in those markets.

By making a strong commitment to green value chains, China can transform its global brand. Doing so is also consistent with plans to restructure and upgrade China's economy. When Japan and Korea moved up the manufacturing ladder from low- to high-value products, they did so by improving the performance and quality of their goods. In today's economy, high-value products also need to embody values such as "low-carbon," "energy efficient," "organic" or "sustainable." Greening global value chains is thus essential not only for China's food security and domestic development, but also for its global competitiveness.

⁸³ In the 2010 goodpurpose survey by Edelman, nearly 80% of consumers in China expect brands to be involved in good causes and at least 70% of them will more likely recommend a brand if it supports social causes (higher than mid-50% in Western Europe). <http://www.edelman.com/p/6-a-m/good-purpose-goes-global>

⁸⁴ Hayward, R., McLean, E., and Jhanji, A. (2014). *The Consumer Study: From Marketing to Mattering - The UN Global Compact-Accenture CEO Study on Sustainability*. Accenture, UN Global Impact, and Havas Media.

3.4 Greening Global Value Chains is Important to China's Growing Global Role

While China's most pressing reasons for greening value chains may be domestic, it should also consider the importance of these issues to its growing role in the global economy and in global governance. In an interconnected world, sustainability concerns are inextricably linked to economic globalization. No longer just an importer from the South and exporter to the North, China is also an investor, lender and aid donor, particularly in its South-South economic relations. China is already the world's second leading source of Overseas Direct Investment (ODI), and is pursuing capacity cooperation with many Southern partner countries, helping build the economies of others while reforming its own economic structure.

3.4.1 Upholding the ideals of an Ecological Civilization

China has taken a more proactive role in a whole range of bilateral, regional and multilateral initiatives where sustainability is a key issue, such as the G20, APEC and WTO. Along with this expanded role, China has also adopted a more expansive vision of development embodying the philosophy of Ecological Civilization. Greening commodity value chains is a key approach to integrating the philosophy of Ecological Civilization into China's growing international engagements, including the Global Going Out Strategy, BRI, and the Asian Infrastructure Investment Bank (AIIB).

As China's role in the world grows, the environmental and social performance of Chinese companies and their suppliers is coming under increasing scrutiny, and the irresponsible actions of individual firms could undermine positive initiatives such as BRI and AIIB. By improving the environmental performance of Chinese firms and their suppliers, China can demonstrate its commitment to a new model of cooperative and mutually beneficial development.

3.4.2 South-South Cooperation

China has emphasized its partnerships with other Southern countries, especially the BRICS. Global value chains for commodities are at the heart of China's trade with the BRICS countries – comprising 50% of its imports from India, and more than 80% of its imports from Brazil, Russia and South Africa. Fossil fuels are a major part of this trade, of course, but China is also the dominant player in many other sectors. China accounts for 40% of Russia's exports of fish and seafood, for example; and 21% of Russia's exports of timber.⁸⁵ China has a robust trade relationship with Brazil, and more than 80% of that trade is commodities.⁸⁶ The majority of this comes as soybeans, comprising 41% of total Brazilian exports to China in 2014.

In many cases, the production of these commodities has massive environmental impacts.

⁸⁵ WWF-Russia. (Forthcoming). *Export of Timber from the Russian Far East 2004-2014*.

⁸⁶ Observatory of Economic Complexity (OEC). (n.d.) What does China import from Brazil? 2014. Retrieved October 10, 2016 from http://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/chn/bra/show/2014/.

Those impacts are not captured on trade balance sheets, but they are felt in the source countries and decried globally. A strong focus on greening commodity value chains will be essential to ensuring that China's South-South partnerships are strong.

3.4.3 *The Belt and Road Initiative*

BRI can and should be an opportunity to explore and demonstrate this new direction. Incorporating not just economic efficiency but also social utility and environmental sustainability into global value chains throughout BRI will not only build an Ecological Civilization, but also help uphold BRI's principles of mutual respect and common prosperity.

In discussions of BRI, the focus has typically been on development, infrastructure and increasing trade. Discussions of the environmental aspects of BRI tend to focus on the direct impacts of infrastructure investments. Those discussions do not seem to be addressing the sustainability of global value chains. Yet, in fact, BRI is building the China-led global value chains of the future. Those value chains will be a major part of its impacts on the environment, and on the communities and countries it engages. There is both an opportunity and an urgent need to ensure that they are green.

The Chinese government has stated that, in pursuing BRI: "We should promote Ecological Civilization in conducting investment and trade, increase cooperation in conserving the environment, protecting biodiversity, and tackling climate change, and join hands to make the Silk Road an environment-friendly one."⁸⁷ The single most effective way to achieve this will be to ensure sustainability at every link in the value chain, from the processes of extracting raw materials all the way to what happens at the end of a product's life. This will help upgrade the quality of the economy, since pollution and waste are forms of economic inefficiency in resource use. And it will demonstrate China's commitment to a new form of mutually beneficial economic cooperation by providing China the products it needs while protecting natural ecosystems, long-term environmental health and resource endowments of partner countries.

3.5 Green Global Value Chains are Important to China's Global Obligations

Value chains, especially agriculture and forest value chains, are also central to China's global development and environmental commitments. With the landmark climate change agreement in Paris and the creation of Sustainable Development Goals for 2030 (SDGs), the world has embarked on a new, more serious quest for sustainability. China played a leadership role in forging these new agreements, and China's continued leadership will be essential to their success. That will require paying attention to the impacts of the global value chains that are the lifeblood of the global economic development and that are also a major source of greenhouse gas emissions.

⁸⁷ NDRC, MOFA, and MOFCOM of the People's Republic of China. (March 2015). Visions and Actions on Jointly Building Belt and Road. *Xinhua News*. http://news.xinhuanet.com/english/china/2015-03/28/c_134105858.htm.

3.5.1 The Paris Agreement

China has made a strong commitment to reducing its greenhouse gas (GHG) emissions. The carbon footprint of China's commodity imports should be addressed as part of that effort. As noted above, agriculture and deforestation account for 24% of global GHG emissions.⁸⁸ Four commodities – soy, palm oil, timber and pulp, and beef – are the principal drivers of deforestation.⁸⁹ As a major consumer, China is in a unique position to engage its trading partners to help ensure the sustainable production of those commodities; and Chinese firms have tremendous power to influence the practices of their suppliers. Many major multinational firms from around the world have made commitments to eliminate deforestation from their value chains, but without stronger leadership from the world's leading buyer of these commodities, progress has been slow. With her increasing ability, China has an obligation as a signatory to the Paris Agreement to think beyond its own borders and help clean up the value chains of its commodity imports associated with tropical deforestation. By doing so now, China will enhance its position as a leader in helping move forward the global fight to save the climate.

3.5.2 Addressing the Agenda 2030 Sustainable Development Goals

The UN Sustainable Development Goals emphasize the urgent need to address water scarcity, deforestation, illegal fishing and other impacts associated with global commodity value chains. China played a central role in the success of the predecessor to the SDGs – the 2015 Millennium Development Goals (MDGs). China's dramatic and broad-based economic growth in the 1990s and 2000s was the key to the achievement of the MDG's poverty reduction target. The SDGs will require a much broader engagement.

In support of the SDGs, China has formulated its 2016 *National Plan on Implementation of the 2030 Agenda for Sustainable Development*. The National Plan includes several measures that will be important to greening global value chains. It calls for action to “effectively regulate harvesting and end overfishing, illegal unreported and unregulated fishing and destructive practices,” for example, and commits to provide incentives and financial support to developing countries to advance sustainable forest management. It calls for “expand[ing] the scope and scale of green procurement,” and for mobilizing China's South-South Cooperation Fund on Climate Change to help developing countries to enhance their capacity for climate change mitigation.

These commitments are an important beginning. They do not yet fully reflect the cross-cutting nature and importance of value chains for achieving the SDGs, however. Whereas China's contribution to the MDGs came entirely through domestic economic growth, the opportunity for making a decisive contribution to meeting the SDGs is in strong action to raise the sustainability of its global economic relationships.

⁸⁸ IPCC. (2014). *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

⁸⁹ Lawson et al., 2014.

4. POLICY TOOLS TO GREEN GLOBAL COMMODITY VALUE CHAINS

The Government of China can promote green global value chains through direct action, such as regulation or its own purchasing; through its mandates to enterprises; and through its international engagements. China's own experience and the experience of other countries illustrate the possibilities.

4.1. Role of Government

The Government of China can play a direct role in greening global value chains through its own procurement, and through the regulation of imports into China.

Green public procurement: Governments can use their own purchasing power to help create a market for sustainably produced goods. In cases where the government is a major buyer, this shift in purchasing can play an important role in moving the market toward sustainability. Some governments have included sustainable commodities in their procurement requirements. In 2012, for example, the UK's Government Buying Standard was amended to require that the government achieve 100% sourcing of credibly certified sustainable palm oil by the end of 2015.⁹⁰

China, too, has an opportunity to use its own public procurement as a lever for sustainability. Already, the Ministry of Finance and MEP have jointly published a government green procurement recommendation list, which targets energy-saving and environmentally friendly products and services. If extended to the concerned commodities, it could, for example, require that government agencies purchase only commodities that were produced in compliance with applicable local and international laws, or with international or national sustainability standards. With government purchases in 2010 amounting to 842 billion RMB, or 2.1% of China's GDP, China can drive significant change through green public procurement.⁹¹

Verification of Legality: Illegal trade undermines a producing country's efforts to manage its resources and undercuts responsible producers. So a first step in greening global value chains is to ensure that commodities have been produced in compliance with the laws of the producing country and applicable international laws. Through regulations like the U.S. Lacey Act and the European Union Timber Regulations, some importing countries are protecting natural resources and wildlife species by requiring compliance with domestic and international laws as a condition for accepting imports.

China's Timber Legality Verification System is a first step towards establishing legal timber governance, discussed earlier. There is great potential to make it more robust. Already, the EU and China are working to integrate EU-licensed timber in the guidelines.

⁹⁰ UK Department for Environment, Food and Rural Affairs. (October 2015). *UK Consumption of Sustainable Palm Oil*.

⁹¹ Wang, P. (2011). *Regional: Asia Pacific Procurement Partnership Initiative*. Asian Development Bank. <https://www.adb.org/sites/default/files/project-document/60662/43149-012-reg-tacr-05.pdf>.

Opportunities to improve legality are not limited to timber. As noted earlier, a significant share of the global wild fish catch is harvested illegally, and illegal deforestation continues to underpin commodity production, particularly for palm oil, soy and beef.

Economic incentives: Tariffs and taxes have been widely used to encourage environmentally responsible behavior. Other countries have used these tools to address challenges like deforestation – India factors forest protection into allocation of government revenues to municipalities; Brazil imposes credit sanctions on municipalities that fail to control deforestation. China has used tax relief to promote green industries, and to encourage consumption of some imported goods. Preferential taxes or tariffs, keyed to internationally recognized sustainable production and natural resources management practices, could be applied to commodity production, investment and trade – incentivizing importers to prefer sustainable goods and producers to produce sustainably.

Green finance: The movement for green finance is growing, and China has been in the vanguard. In 2012, China Banking Regulatory Commission published the Green Credit Guidelines. In August 2016, China adopted “guidelines for establishing a green finance system,” which represent an integrated policy to promote a shift towards a green economy. This announcement was made on the eve of the 2016 G20 summit, in which, for the first time, green finance was an integral part of the meeting agenda. Innovative financial mechanisms can be an important part of enabling a transition to sustainable commodity production and stronger resource management in China and its trading partner countries, opening up options for integrated public-private financing that reduces risks for the private sector to invest in sustainable commodity production.⁹²

In December 2015, China became the first government to establish rules for green bonds. In the first half of 2016, China issued a total of \$11.2 billion USD in green bonds. If China applied sustainable commodity production standards to these bonds, they would become a powerful vehicle for promoting green global value chains.

Source: Xinhua News. (31 August 2016). China to establish green financing mechanism for greener growth. http://news.xinhuanet.com/english/2016-09/01/c_135649154.htm

4.2. The Role of Enterprises

Major companies have played an important part in international efforts to green global value chains. As China addresses this challenge, Chinese companies could help lead industry-wide green transformations, working both upstream and downstream in the supply chain. To do so, however, they will need a clear signal from the government that this a national priority.

⁹² Xu, N. & Yao, W. (29 July, 2016). China's green bond market booms with more clarity in policy. *China Dialogue*. <https://www.chinadialogue.net/article/show/single/en/9128-China-s-green-bond-market-booms-with-more-clarity-in-policy>.

Guidelines: Governments or trade associations have issued guidelines as a way to encourage enterprises to act without, or as a step toward, regulation. Guidelines provide a clear signal of a government's priorities and an explicit statement of government interests, and leading firms may see guidelines as both license and impetus for action.

Overseas, the European Feed Manufacturers' Federation issued Soy Sourcing Guidelines in 2015, which set forth baseline criteria and verification requirements for the soy sector. In China, as noted earlier, guidelines have been issued by some trade associations, including CCCMC, for due diligence and ethical sourcing in the mining industry, and CFNA, for sustainability and best management practices in palm oil. A note of caution is in order, however. An International Institute for Environment and Development study of a series of Chinese overseas investment guidelines found that without carrots or sticks to companies, guidelines often have little effect,⁹³ so follow up is crucial.

Company commitments and alliances: Company commitments and alliances can help create critical mass for movement towards green value chains. Globally, members of the Consumer Goods Forum, an association of the world's largest consumer products companies and retailers, have

committed to eliminating deforestation from their supply chains by 2020. That goal is now supported by the Tropical Forest Alliance, a partnership of NGOs, companies and governments.

Chinese companies have also established their own initiatives. In 2016, 48 real estate companies launched a green supply chain initiative; 29 of which specifically committed to sustainably-sourced wood products.⁹⁴ By banding together, companies, NGOs and governments can send strong signals demanding sustainable global value chains and supporting producers.

AN ALLIANCE ON SOY: A consortium of 10 leading international and Chinese soy traders, including ADM, Wilmar, Bunge, Cargill, COFCO and five other Chinese companies, convened by the Paulson Institute, have committed to jointly implement a phased transition to sourcing of sustainably produced soy from South America.

Traceability and transparency: As explained above, advances in data technology are rapidly expanding the tools available to ensure that global value chains are traceable and transparent. Traceability and transparency provide a powerful incentive for sustainability. Traceability allows enterprises and consumers to know the origins of the products they buy, tracking them from raw material extraction to production to finished goods. Transparency provides visibility over the environmental or social impacts of each step in that supply chain. Together, these tools create accountability for environmental performance, and allow consumers to buy with confidence.

Many international voluntary standards systems establish traceability regimes. FSC and

⁹³ Weng, X. and Buckley, L. (eds.) (2016). Chinese businesses in Africa. Perspectives on corporate social responsibility and the role of Chinese government policies. IIED Discussion Paper. London, UK: International Institute for Environment and Development.

⁹⁴ WWF China. (6 June, 2016). *Green Compact – Chinese Companies Launch Responsible Timber Supply Chains* ("绿色契约—中国房地产企业发起负责任木材供应链行动"). <http://www.wwfchina.org/pressdetail.php?id=1698>

MSC, for example, offer robust chain of custody regimes for certified products. In fact, over three hundred Chinese businesses have been awarded the MSC's chain of custody certification, which provides ship-to-shelf traceability for wild-caught fish that have been MSC certified, and over 4,000 have achieved FSC chain of custody certification. Some Chinese companies have begun to establish their own systems: COFCO recently published traceability guides and standards to manage the sustainability of its suppliers.

Increasingly, consumers and regulators are demanding more information about the safety, quality, security and sustainability of products. To respond to this rising demand, China could require greater traceability for traded goods or strengthen regulations to eliminate false or misleading product labels. China could also build an information base to monitor, report and disseminate information on the social and environmental impacts of commodity industries in order to ensure the credibility and sustainability of Chinese companies domestically and internationally.⁹⁵ Actions such as these could play an important role in ensuring the sustainability of China's global value chains, and the competitiveness of Chinese enterprises.

4.3. International Partnerships

As noted above, China has established itself as a leader in the global effort to address climate change, and more broadly to foster sustainable development. In support, China can advance sustainable commodity value chains through its international engagements.

Alignment of Chinese and international standards for sustainability: International standards lie at the heart of many global efforts to improve the sustainability of commodity production. China, too, has developed, or is developing, national standards to regulate the environmental impacts of its commodity production. Its China Forest Certification Scheme resulted from a careful study of forest certification standards worldwide, and has been endorsed by the PEFC, one of the two major systems for forest certification. In the palm oil industry, China Quality Mark Certification Group Production Certification (CQM-PCC), one of the largest Chinese certification agencies, entered a memorandum of understanding with the RSPO to jointly identify ways to implement RSPO standards. Continued engagement with international standards, and additional action to align national standards and labels with international ones will help improve the sustainability of goods coming into China and strengthen the position of Chinese goods in the global market.

Development assistance: Many global value chains are currently unsustainable because governments are unable to effectively manage their resources, and producers lack the technical skills or resources to move to more efficient and sustainable production and gain access to global markets. Many donor countries are helping their commodity-producing trade partners to improve environmental performance and maximize development benefits by providing capacity building support and technical assistance. They are helping to improve productivity of small producers, for example; strengthen

⁹⁵ Potts, J., et al. (2014). *The State of Sustainability Initiatives Review 2014: Standards and the Green Economy.*

management of forests, fisheries, and other resources; and improve land tenure and governance. China has also provided important support to partner nations, for example, by establishing Agricultural Technical Demonstration Centers in 17 countries and dispatching more than 1,000 experts to provide training since 2010.

Recognizing the climate impacts of land use, some governments have gone further to offer payments for reducing deforestation. Norway has been a leader here, notably committing US\$1 billion each to Brazil and to Indonesia, and US\$150 million to Liberia, to be disbursed as progress is made in reducing deforestation.

Through these and other models, expanded assistance for sustainable commodity production can help key producing nations strengthen their capacity and step up to the standards that China and international markets expect.

Trade agreements: Countries can promote and incentivize sustainable sourcing of commodities through trade-related agreements, and potentially through bilateral sustainable sourcing agreements. In 2014, 17 WTO members, including China, the US, the EU and Japan, began negotiations on the Environmental Goods Agreement (EGA), which aims to reduce tariffs on more than 50 environmental goods. While this does not yet include sustainably produced commodities, the EGA's product coverage is still under negotiation, and could be expanded to include commodities. Recently, WTO Members have also revived their negotiations on fishery subsidies aiming for practical results by the eleventh Ministerial Conference (MC11) of the organization in 2017; China's leadership and constructive engagement will be the key to success. The U.S. and the EU have promoted sustainable forest management in trade-related agreements, which aim to promote legal trade in timber products and to combat illegal logging. Both have entered agreements on illegal logging with China.

There is particular promise in bilateral sourcing agreements between China and its supplier countries that assure both sustainability and long-term supply. As noted above, the soy industry is a good candidate. Now that Forest Code compliance is a requirement for soy farmers and exporters by the Brazilian government, for example, bilateral sustainable sourcing agreements could send a demand signal that both accelerates Forest Code implementation in Brazil and demonstrates that the demand for soy in China is compatible with improved sustainability in exporting countries. Bilateral "sustainable mining partnerships," discussed in the copper case study above, could similarly be a promising solution for key "hard" commodities.

As these examples demonstrate, there are many tools that can be used to green China's global value chains. We were encouraged to see that Chinese private firms, SOEs and government agencies have already begun experimenting with many of these tools, but so far their use is tentative and uncoordinated. A strong and clear signal from the central government is needed to move this greening process forward. Such a signal would not just be heard by Chinese companies and suppliers. It would also tell the world that China is serious about its global leadership in a new type of international economic cooperation that is fair and sustainable.

5. RECOMMENDATIONS

5.1 The Journey

Green global value chains – value chains that are environmentally, socially, and economically sustainable – will play a crucial role in the green rise of China. New frameworks for green global value chains are vital to China’s continued economic development and resource security, to the goals of BRI and the Going Out Strategy, and more broadly in shifting world trade on to a path that the Earth can sustain. Global value chains for commodities are a particular priority – vital to China’s continued economic development and food security, and to its relations with trading partners and its global commitments.

Chinese agencies and enterprises have begun exploring the potential for green global value chains and Chinese consumers are increasingly demanding green products, but bold action from Beijing is required to set this new direction and enable the shift. We therefore have the following recommendations:

Recommendation #1: The Government of China should play a leadership role in promoting the sustainability of global value chains in international governance and policymaking through an integrated policy package that addresses investment, trade, standards, certification and capacity building.

Ultimately, international laws and institutions must support green global value chains. Already, institutions like APEC and the Council of the European Union have sent clear policy signals for global value chain development and cooperation.⁹⁶ With rising importance in global markets, its commitment to an Ecological Civilization, and its commitment to international action on climate and the SDGs, leadership from China is crucial. China can lead through both multilateral and bilateral engagements by:

- Promoting green global value chains through creation of an “**Eco-20**”, launched with Germany and other countries at the next G20, to implement Hangzhou Summit’s outcomes, and to shift to sustainable production, consumption and trade by smart, green and inclusive innovations;
- Promoting green global value chains in multilateral trade negotiations, including the **WTO** negotiations on environmental goods and services, a relaunch of the WTO negotiations on fishing subsidies, and negotiations within **APEC**;
- Initiating an agenda to green global value chains in order to protect biodiversity as the applicant to host the 14th COP of the Convention on Biological Diversity;
- Incorporating greening of global value chains in its bilateral trade agreements. In particular, China should enter **sustainable sourcing agreements** with key trading partners for important commodities, such as Brazil, Argentina and Paraguay for

⁹⁶ Council of the European Union. (12 May 2016). Proceedings from The Council of the European Union: The EU and Responsible Global Value Chains. <http://data.consilium.europa.eu/doc/document/ST-8833-2016-INIT/en/pdf>.

- soy and beef; and Indonesia and Malaysia for palm oil; and Chile and Peru for copper;
- Aligning Chinese **sustainability standards** with international standards, and reaching consensus with major commodity production countries on the verification schemes for the specific and concerned commodities.

Recommendation #2: The Central Government should send a clear policy signal, through issuing 'Guiding Opinions on Practicing Sustainability Principles for Chinese Enterprises in International Trade and Overseas Investment' by the State Council, to encourage Chinese companies and multinational companies trading in China to green their global value chains.

In many sectors, leading multinational companies have begun to take action to promote more sustainable practices. Chinese companies have generally held back from joining such international efforts to green global value chains, awaiting an indication that the Government would support their engagement. A Guiding Opinion from the State Council could set out important principles and actions, including:

- Encouraging and authorizing companies to enter **voluntary sustainability commitments** and alliances with other Chinese and international companies in their sector;
- Applying internet of things and big data to establish systems for **traceability** to provide assurance of the origin, legality and sustainability of commodities in trade;
- Adopting **international standards** or trade association guidelines for more sustainable sourcing;
- Providing **financial incentives**, such as preferential tariffs for sustainably produced commodities or preferential lending to companies that practice sustainable sourcing.

Recommendation #3: The NDRC, Ministry of Foreign Affairs and MOFCOM should create an initiative or an action plan for greening global value chains as a core priority for the Belt and Road Initiative.

The goal of the Belt and Road Initiative is to expand economic cooperation, improve the governance system and generate new growth opportunities across more than 60 countries, accounting for 60% of the world's population. Its most important benefits and impacts will come from the greatly expanded trade and investment cooperation that it yields.⁹⁷ Ensuring that those value chains are green will be vital to China's interests and to sustainable development in BRI partner countries. Actions to promote green global value chains through BRI could include:

- Setting up systems and measures to **verify legality and sustainability** of traded

⁹⁷ Garcia-Herrero, A. and Xu, J. (2016). China's Belt and Road Initiative: Can Europe Expect Trade Gains? *Working Paper*. Issue 5. Brussels: Bruegel.

- commodities;
- Providing **green finance** – e.g., by incorporating sustainable trade finance into the Green Lending Guidelines; by developing commodity sector-wide financing mechanisms to provide long-term, first-risk capital to leverage investment from commercial investors.
- Establishing a partnership among BRI countries to **share best practices** on low carbon, circular economy, and efficient economy transition.

Recommendation #4: China should champion constant innovations in South-South collaboration models through bilateral and multilateral international aid. It should also invest aid and other finance resources in greening global value chains.

Recognizing the central importance of global value chains to many of its partner countries, China should use its bilateral aid, the new multilateral banks, the Silk Road Fund, and the South-South Cooperation Fund for Climate it has created, to help its trading and investment partner countries move to more sustainable production by funding, for example, programs to:

- Strengthen **resource management capacity** in producing countries;
- Improve **agriculture productivity**, especially by small producers;
- Build stronger systems for **traceability and labeling** to ensure that Chinese imports are legal and sustainable;
- Provide grants to Chinese and local **NGOs** to support producers to improve sustainability in production and trade.

5.2 First Steps

We suggest that China take three concrete first steps to get started on the journey toward green global value chains:

First Step #1: The State Council should mandate State-Owned Enterprises to lead in making commitments to assure the sustainability of the commodities they buy.

SOE's are often the largest companies in their sectors and wield tremendous influence with their peers. The State-owned Assets Supervision and Administration Commission (SASAC), together with NDRC and other agencies, can clarify the important role SOEs should play in greening global value chains, and mandate the leadership of SOEs in sparking action by private companies in their sectors. Concrete measures include individual commitments to sustainable sourcing – such as traceability, measures to assure legality, a commitment to no deforestation – as many multinational companies have done. SOEs could also encourage Chinese companies to join together or with their international peers. The commitment of 48 Chinese real estate companies to sourcing sustainable wood products, and the newly established alliance of international and Chinese traders for sustainable soy are striking examples of the potential.

First Step #2: The Government of China (led by Ministry of Commerce, Ministry of Agriculture, General Administration of Quality Supervision, Inspection and Quarantine, and Ministry of Environmental Protection) should launch a pilot program to establish best practices for greening the global value chains for soy, palm oil, and forest products.

Soy, palm oil and timber are three of the largest drivers of deforestation globally, and thus major contributors to accelerating climate change. Many of the world's leading companies and some governments have committed to action on deforestation; success of those efforts will depend in large measure on China's leadership. An integrated initiative, bringing together multiple policy tools to move these commodities to sustainability, could be a powerful pilot for the Green Global Value Chain agenda. Elements could include:

- Including soy, palm oil and wood and paper products fulfilling green standards in **green public procurement** requirements;
- Signing **bilateral sustainable sourcing agreements** with major supplier countries to reach consensus on the key elements of sustainable production and trade, including the verification schemes for sustainability;
- Encouraging Chinese companies to **join international sustainable sourcing commitments** and establishing traceability system in their supply chains for verification of legality and sustainability;
- Requiring State-Owned Enterprises to **comply with sustainability standards** in their overseas investment in production and sourcing;
- **Directing South-South cooperation and development aid** to support producing countries in implementing sustainability requirements;
- Providing **preferential tariffs** for imports of goods certified under standards that comply with the WTO Technical Barriers to Trade Code of Good Practice.

First Step #3: NDRC, together with Ministry of Finance, MOFCOM, etc., should jointly launch a “Green Global Value Chain South-South Cooperation Platform” under the newly-established “South-South Cooperation Fund on Climate Change” to support the sustainable and low-carbon production and trade of commodities.

Global value chains are fundamental components of China's trade and investments with the BRICS, and many other developing countries, and thus lie at the very heart of China's South-South relations. Investing in greening those global value chains and low-carbon development thus is a natural part of the South-South Cooperation Fund on Climate Change, and an area where NDRC, MOF, MOFCOM, etc. can play a key role. We suggest that the initiative focus on the following aspects:

- Establishment of a “Green BRI Alliance of Enterprises” to foster collaboration of enterprises of China and BRI countries on sustainability;
- Capacity building for resource-concentrated partners of China on environment and resource protection;
- Training of Chinese leading companies and their counterparts in Southern countries on green supply chain management and sustainable sourcing practices.

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