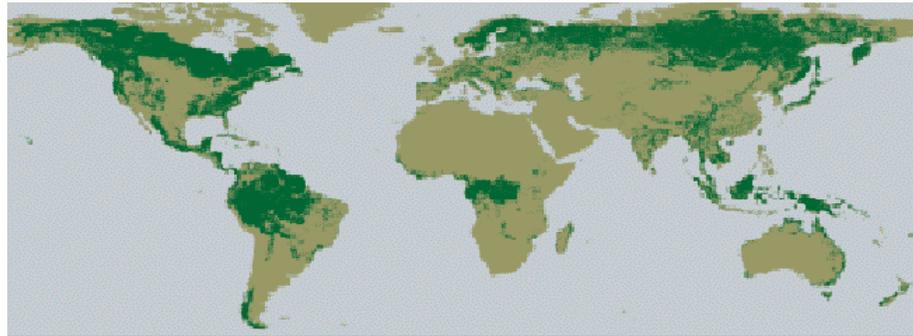


Global Context of California's Economy and Environmental Concerns

Global competition, trade, and technology are the major forces driving all components of California's economic structure. While Silicon Valley and Hollywood are the largest and most visible symbols of California's global role, the



Forests throughout the world

same forces driving global integration have a large and growing impact on the forest and rangeland regions of California. Local availability of natural resource bases will no longer be the major source of competitive economic advantage for our forest and rangeland dominated regions. Technology, research and development (R&D), and new commodities that add value and adapt to distant markets now give the competitive edge. Trade is the lifeblood of the global economy within which California operates.

The international rules and consumer preferences that influence trade will also play a major role in determining how stronger global trade will affect the forest and rangeland regions of California. Global environmental concerns related to forests, fisheries, biodiversity, and climate change all have effects on trade, national environmental policies, and socio-economic conditions of local areas. Discussions on these topics are taking place in a variety of international forums, both as a part of, and separate from, the trade negotiations.

This chapter begins with some examples of how international trade agreements have significant and growing impacts on commodities such as timber, cattle, and specialty agricultural products that historically have been the pillars of the economies of forest and rangeland California. This is followed with a short review of the major international environmental commitments that will affect trade in these commodities. It concludes with a review of the major trends in international trade of goods and services, as these trends will be central to the growth of new economic activity throughout the forest and rangeland regions of California.

Development of international agreements

The United States is involved in numerous of efforts with other nations and international organizations, including both trade and environmental agreements, which have an impact on California's economy. This is significant because international agreements may bind states, just as they do the federal government, to trade principles, practices, and grievance procedures (Orbuch and Singer, 1995).

Individual states, especially, may be affected when their standards (health, environment, product quality, etc.) conflict with trade agreements and subject states to an international challenge.

Trade agreements are important to California because of the significant size of its exports. Both forest and rangeland related industries are affected by the context of international trade agreements (U.S. Department of Agriculture, 2001b). Table 1 summarizes the trade agreements that are most relevant to California forest and rangeland industries.

Table 1. Trade agreements

Treaty	Subject	Impact/status
CUSTA	Reducing trade barriers between U.S. and Canada	Most duties on cattle and beef products eliminated.
Canada–U.S. Softwood Lumber Agreement	Canadian shipments of softwood lumber into U.S.	For duration of agreement (1996–2001), Canada levied fees against lumber shipped to U.S. from certain provinces. Some observers suggest that this raised the price of softwood lumber in the U.S. and hurt homebuilders and consumers. Agreement expired in 2001 and since then, U.S. has re-imposed duties on Canadian lumber.
GATT	Series of international conferences between 1947–1993 that focused on reducing trade barriers between member countries	Final agreement in 1994 creating WTO and a “Schedule” with concessions by countries on access for goods, services, and agriculture.
NAFTA	Commencing in 1994, reduces trade barriers between Canada, U.S., and Mexico	Agricultural provisions of CUSTA, including for livestock, moved into NAFTA. Tariffs on beef and cattle exported to Canada and Mexico eliminated. All agricultural provisions implemented by 2008. Provides a way to resolve California standards for protection of humans, plants, and animals.
WTO	Replaced GATT in 1995 as the international framework for lessening trade barriers	WTO rules cover a variety of areas of concern to agriculture, timber, and other industries in California. Rules cover market access, export subsidies, internal support of domestic industries, and health/safety standards. Both U.S. beef and sheep industries have been involved in international trade disputes under WTO rules.
Asia Pacific Economic Cooperation	Public sector forum set in 1989 to promote greater economic and trade cooperation on Pacific Rim	Work plans have been established in areas such as biotechnology, marketing and processing of agricultural products, plant and animal quarantine and pest management, agricultural finance systems, and sustainable development (see WTO trade restrictions actions).
Free Trade Agreement of the Americas	Aims to consolidate the many existing bilateral and regional trade agreements between Latin America and Canada, but excludes the U.S.	Would create a hemisphere-wide free trade pact by 2005.

CUSTA – Canada–U.S. Free Trade Agreement; GATT – General Agreement on Tariffs and Trade; NAFTA – North American Free Trade Agreement; WTO – World Trade Organization

Rangeland industry

International trade considerations have affected the livestock industry in several ways including: 1) lowering tariffs and other monetary barriers; and 2) reducing the impact of sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT).

Tariffs

Meat and other agricultural products have been included in regional and global trade negotiations. Regional negotiations have been conducted between the United States and Canada, Mexico, and Japan. The North American Free Trade Agreement (NAFTA) between the U.S., Canada, and Mexico incorporated or revised earlier trade arrangements. NAFTA eliminated or phased out tariffs and quotas between U.S. and Mexico on cattle; edible offal; and fresh, chilled, frozen beef, veal, animal fats, and skins and hides (U.S. Department of Agriculture, 2001a) (see [Cattle and Beef](#)). The elimination of tariffs on beef exports to Mexico, negotiated under NAFTA, has helped increase U.S. beef exports to Mexico.

In addition, multilateral trade reforms negotiated in the Uruguay Round and the creation of the World Trade Organization (WTO) with its trade agreements have altered trade patterns (for an explanation go to [WTO trade restrictions actions](#)). Together with NAFTA, these have led to closer linkage of the North American beef and cattle markets. The United States provides breeding animals to both Canada and Mexico; the United States also supplies cattle for slaughter to Mexico and cull cows to Canada. Mexico in turn exports primarily feeder cattle to the United States for finishing, while Canada ships mostly slaughter-ready animals (steers, heifers, and cows) to the United States. In the case of lamb, trade reforms worked against the U.S. lamb industry, at least in the short term, by allowing the import of lower priced foreign lamb supplies.

Example of the impact of tariffs: As an example of the impact of tariffs and other trade barriers, trade barriers have been a significant factor to the world meat trade. Beef imports into Japan rose substantially after removal of its quota system for beef imports (negotiated in the 1988 Beef–Citrus Agreements) and from reductions in tariffs since 1995 (as part of Uruguay Round negotiations). South Korea opened its beef market by use of an import quota in 1988 and has raised the quota level several times. There have been sizeable increases in meat trade in North America associated with the Canada–U.S. Free Trade Agreement (CUSTA) and NAFTA Agreements. There has also been an expansion within South America from the MERCOSUR Agreement (Economic Research Service, 2000b).

Sanitary and phytosanitary and technical barriers to trade

Imports may cause public health, safety, or animal and plant disease impacts. Hence, many countries place restrictions on certain imports, referred to as sanitary and phytosanitary (SPS) standards. Legitimate food safety and health standards typically address issues such as product standards and testing, labeling requirements, or bans on unacceptable imports. When these regulations are applied arbitrarily or without a sound scientific base, however, they become thinly hidden trade barriers.

The WTO reached an Agreement on the Application of SPS and TBT Measures, implemented in January 1995. SPS measures permit countries to set their own standards regarding plant, animal, and human health. These standards must be based on science and cannot discriminate against individual countries. The TBT agreement guards against regulations, standards, testing, and labeling requirements that create artificial barriers to trade.

SPS and TBT agreements are especially important to California agriculture and livestock because California exports many specialized agricultural products. While much progress has been made in reducing trade barriers, some countries that are major export areas for California products still protect their domestic agricultural sectors. For example, the European Union offers export subsidies on beef, cheese, other dairy products, and processed fruit, in competition with California (U.S. Trade Representative, 1999).

Wood products industry

International considerations in the wood products industry also have related to trade disputes and to phytosanitary standards. In 1989, CUSTA phased out most of the solid wood products tariffs. This process was continued by the Uruguay Round of trade negotiations in 1993. The Canada-U.S. Softwood Lumber Agreement in effect from 1996 through 2001 limited tax-free imports of softwood lumber into the United States from Canada. This effort attempted to address concerns by U.S. lumber producers about Canadian policies that led to substantial quantities of softwood lumber being exported to the United States. However, the issue has not been resolved. On expiration of the agreement, the U.S. has imposed duties on Canadian lumber, accusing Canada of “dumping” its softwood lumber into the U.S. market and hurting American producers.

Economic impacts of the Canada-U.S. Softwood Lumber Agreement: The Canada-U.S. Softwood Lumber Agreement in effect raised the cost of lumber by \$50 to \$100 dollars per thousand board feet at the margin. Combined with strong U.S. housing demand, softwood lumber prices rose sufficiently to increase the profitability of lumber production. Industry responded by building new plants and expanding existing ones, with softwood sawmill capacity in the United States and Canada expanding by 13 percent from 1995 through 2000. Mills in the western U.S. expanded at a slower capacity (about six percent) than mills in the east because they faced higher costs of timber and weak demand for lumber from Japan. The overall increased capacity required additional demand. However, the demand for softwood lumber did not materialize because of higher interest rates and declining construction. This led to excess capacity and falling lumber prices, which in 2001 were below the cost of production. As a result, a number of mills closed or cut back operations (Kosco, 1999).

A second area of international concern in the wood products industry relates to the movement of forest pests between countries. Historic examples include introduction of chestnut blight and Dutch elm disease into the United States. More recently, an outbreak of the Asian long horned beetle led to the destruction of scores of hardwood trees in neighborhoods in New York and Chicago.

There has been much discussion over movement of pests in solid wood packaging materials such as pallets, wood dunnage, crating, cable spools, packing blocks, drums, cases, and skids. In November 1998, the United States, Canada, and Mexico (under the North American Plant Protection Organization umbrella) agreed on ingredients of a common phytosanitary standard to address the risks related to solid wood packaging materials. Currently, with the exception of China and Hong Kong, the United States depends on self-declaration by importers that packaging is free of bark and apparently free of insects. Since December 1998, standards that are more stringent have been applied to packaging materials that

come from China and Hong Kong. It is estimated that between one-quarter and one-half of China's exports to the United States (valued at \$42 billion in 1999) were affected by the change (Hicks, 2001).

Sustainability, trade, and the environment

There has been an increasing connection between world trade and environmental issues since World War II. In varying forms, the concept of "sustainability" has come to dominate both environmental and trade discussions (see [Sustainability](#)). To facilitate these discussions, an intricate interconnected network of governments, international agencies, nongovernmental organizations (NGOs), and multinational businesses have evolved in support of sustainability and related programs.

Historical development of sustainability and economic agreements

The basic framework for discussion of environmental issues was set in 1946 when the United Nations accredited The World Conservation Union, also known as the International Union for the Conservation of Nature (IUCN), to become its scientific advisor. Part of IUCN's mission is to ensure that uses of natural resources are "equitable and ecologically sustainable" (World Conservation Union, 2002). Today, IUCN includes 76 states, 111 government agencies, 732 NGOs, 32 affiliates, and some 10,000 scientists. Federal agencies include the U.S. Forest Service, U.S. Fish and Wildlife Service, and National Park Service (IUCN, 2002) (see [The World Conservation Union](#)).

The World Bank was also founded in 1946 with the intent of facilitating the reconstruction of Europe. Since that time, the World Bank has become much larger and more complex. It is formulated as a group, covering five closely associated development institutions: the International Bank for Reconstruction and Development, the International Development Association, the International Finance Corporation, the Multilateral Investment Guarantee Agency, and the International Center for Settlement of Investment Disputes (World Bank, 2002) (see [The World Bank](#)). A common theme among these agencies is economic and environmental sustainability. Projects must incorporate environmental, social, and minority investor safeguards into private sector projects (International Finance Corporation, 2000).

In 1972, the United Nations Conference on the Human Environment (Stockholm) resolved to establish the United Nations Environment Program. Governments signed a number of regional and international agreements to tackle specific issues, such as protecting wetlands and regulating the international trade in endangered species. These agreements, along with controls on toxic chemicals and pollution, have helped reduce the loss of some unique species and habitats. For example, an international ban and restrictions on the taking and selling of certain animals and plants have helped to reduce over-harvesting.

In the early 1990s, there was an up swelling of concern about global environmental degradation and for socio-economic development. Examples of global concerns have been deforestation, loss of biodiversity, climate change, and extinction of species. These concerns resulted in the 1992 United Nations World Conference on Environment and Development, known popularly as the "Rio Summit." A wide variety of people and organizations participated in the deliberations, including NGOs. The assembled leaders discussed and signed several conventions and agreements, summarized in Table 2.

Table 2. 1992 Rio Summit conventions and agreements

Agreement or convention	Focus
Framework Convention on Climate Change (United Nations, 1992a) (see Framework Convention on Climate Change)	Recognizes greenhouse gas issue; sets goal of stabilizing gas level; sets a time frame consistent with functions of natural processes and human socio-economic needs; sets a framework to agree to certain actions later. A subsequent agreement adopted at Kyoto mandated cutbacks in emissions. Shortly after assuming office, President George W. Bush rejected the protocol. Rather, he called for reductions of sulfur dioxide (chief ingredient of acid rain), nitrogen oxide (smog), and mercury (pollutant of streams and lakes), mostly through voluntary measures, \$4.5 billion in tax incentives, and the trading of "pollution credits."
Convention on Biological Diversity (Convention on Biological Diversity, 2002) (see Convention on Biological Diversity)	Goals are conservation of biodiversity, sustainable use of the components of biodiversity, and equitable sharing of the benefits arising from the commercial and other utilization of genetic resources. Key issues include controlled access to genetic resources and access to and transfer of technology and biotechnology.
Rio Declaration (United Nations, 1992b) (see Rio Declaration)	Sets out 27 principles on interactions between countries in environment and development matters.
Forest Principles (United Nations, 1992c) (see Forest Principles)	Sets out principles for global agreement on management, conservation, and sustainable development of forests.
Agenda 21 (United Nations, 1992d) (see Agenda 21)	Plan for sustainable development into the 21 st century (see Implementation of Agenda 21).

In addition, as part of GATT and related trade negotiations, nations have struggled to develop trade rules that would ensure that environmental protection policies were not a mask for trade protectionism. Since 1992, the WTO Committee on Trade and Environment has been separating environmental parameters in trade sanctions and trade restrictions.

Environmental issues, along with issues of ethics and social justice, continue to be difficult in international trade discussions. Opposition of environmental, labor, development, human rights, and other groups helped cause the collapse of negotiations over a Multilateral Agreement on Investment by the Organization of Economic Cooperation and Development, as well as the WTO trade talks in Seattle in 1999. Strong sentiment among these groups continues that investment, especially foreign direct investment (FDI), should be directed towards more socially just and ecologically sustainable development.

For its part, the U.S. government has promoted a trade policy agenda that pursues economic growth in the broader context of sustainable development, integrating economic, social, and environmental policies. In 1999, the Clinton administration issued White House Policy Declaration and Executive Order 13141 requiring environmental review of trade agreements. The U.S. Trade Representative and Council on Environmental Quality issued guidelines to meet the Executive Order in December 2000 (64 Fed. Reg. 63169) (see [Federal Register Notice](#)). In April 2001, the Bush Administration indicated its intent to continue written environmental review of most proposed trade agreements.

Global marketing and sustainability

Another aspect of the global market place is responding to sustainability issues and the push towards marketing based on sustainable resource management. In many countries, consumers are demanding "responsible" practices from businesses from which they purchase products. Mainstream investors such

as pension funds and insurance companies are beginning to take account of social and environmental performance in choosing their investments. Companies that can demonstrate sound management and meet social and environmental performance goals may achieve an advantage in future capital markets.

Another aspect of the global market place is responding to sustainability issues and the push towards marketing based on sustainable forest management.

The search for both market advantage and ways for investors to measure environmental performance has led to the “green label” movement. Within this framework, firms using sustainable management practices are certified as doing so by an independent third party and market their products based on a “green label.” As part of the “green label” movement, various forest certification schemes have emerged. California is very active in forest certification (see section of [Forest Products](#)).

The world market for certified forest products has remained small. Trade statistics do not delineate between certified and non-certified wood, but it is probable that only a very small part of the world wood market deals in these kind of products. Still, in countries where environmental awareness among consumers is strong, demand for certified wood can be significant. While still at a small scale, there are enough examples to suggest a trend of increasing linkages between global environmental goals, consumer purchasing and business investment practices.

U.S. firms that export wood products must be sensitive to changes in tastes and views of foreign consumers. More countries are adopting policies that tie consideration of environmental impacts to economic development schemes. At the same time, wholesale and retail firms, to date primarily in Western Europe but increasingly in the U.S., are exploring the exclusive use of products in their marketing from forests certified as managed in a sustainable manner.

United States overview of trade

The United States is the largest exporter and importer of goods and services in the world. Trade of goods and services and the receipt and payment of earnings on foreign investment has increased 25-fold since 1970 and nearly 120 percent since 1990. In 2000, the value of U.S. trade reached a record \$3.4 trillion. U.S. trade expanded more rapidly than the overall economy from 1970 to 2000. The value of trade in goods and services, including earnings and payments on investment, reached a record 33.7 percent of the value of U.S. gross domestic product (GDP) in 2000.

Between 1990 and 2000, imports of goods and services and payments on investment expanded by almost 140 percent. This comes largely from rising demands created by U.S. income and economic expansion.

However, the U.S. trade deficit (value of imports exceeding exports) has also increased in recent years. This reflected strong consumer demand and investment expansion in the U.S. economy. It also was influenced by financial and economic difficulties experienced by a number of trade partners from 1994–1997, prior to the Asian financial crisis. The total deficit on goods and services trade rose from \$265 billion in 1999 (2.8 percent of GDP) to \$371 billion in 2000 (3.7 percent of GDP). The deficit in goods

trade alone for the U.S. rose from \$346 billion in 1999 (3.7 percent of GDP) to \$451 billion in 2000 (4.5 percent of GDP) indicating increasing imports of foreign goods (U.S. Trade Representative, 2000) (see [U.S. Trade in 2000](#)).

California overview of trade

California is a large importer of goods and services. Foreign trade passing through California ports has grown from \$4.2 billion dollars in 1970 to over \$209 billion in 2002 (California Department of Finance, 2000). No records are maintained of import figures into California alone because the complexity of commercial networks makes it too hard to track the final destination of shipments entering at customs ports. However, value of trade through custom districts in California shows an increasing trade deficit in California.

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Four industry groups account for over half of the exports. These are electronic equipment, industrial machinery/computer equipment, instruments, and transportation. They account for over 60 percent of total exports since 1994. Agriculture and forestry related exports together are less than 10 percent of the total. Still, in 1999 California lead the nation in agricultural exports, with over \$6.9 billion out of a total U.S. export of just over \$49 billion.

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Three countries, Mexico, Japan, and Canada attract almost 40 percent of California's exports. Outside of Canada and Mexico, Asian countries are the largest regional market for California exports (California Technology, Trade and Commerce Agency, 2000a).

Wood products

In the global economy, imports and exports of wood products between countries play a key role. International trade accounts for about 30 percent of world production and consumption of forest products. World trade in forest products is valued between \$150 billion and \$200 billion, and has increased nearly fourfold, in real terms, over the past 30 years (Brooks et al., 2001).

Global wood products trade is primarily between regions. Almost 80 percent of world forest products trade is conducted within Europe (50 percent) or North America (30 percent). Due to the size of its economy, the United States is the largest single importer and the second largest exporter of forest products in the world based on value.

No records are maintained of import figures into California because the complexity of commercial networks makes it too hard to track the final destination of shipments entering at customs ports. Thus, it is

not possible to accurately track California's imports of wood products. California, however, is a net importer of wood, and some of this comes from other countries.

Rangeland products

Today a global market has been created for beef and other meats. Changes in technology and transportation mean that foreign meats can compete against meat produced in the United States. Countries like Australia, New Zealand, and Argentina can, and do, export meat at competitive prices to Europe, Japan, and even the United States. Exports of fresh, frozen, and boxed beef are common (Lambert, 2001). It is also true that historically consumers buy more meat (including red and white meat products) as their incomes improve.

The United States has the largest fed-cattle industry in the world and is the world's largest producer of beef, primarily high quality, grain fed beef for domestic and export use.

In 2000, beef and products totaled over \$165 million and ranked ninth among California's agricultural commodity export values. This is an increase of 25 percent over similar export values of beef and products of \$132 million in 1999, which ranked twelfth in overall export commodities. In 2000, over three quarters of animal products exports from California went to North America or East Asia. Twenty four percent of total animal products went just to Japan (Kuminoff et al., 2001).

No records are maintained of import figures into California because the complexity of commercial networks makes it too hard to track the final destination of shipments entering at customs ports. Thus, it is not possible to accurately track whether imports of livestock and meat stay in California. Still, in the case of beef, it is clear that California has a large beef deficit. Assuming an average meat yield associated with California produced beef, there is a substantial annual net beef deficit which is covered by meat imported from Canada and other states.

Tourism

California also "exports" tourism from its forest and rangelands. For example, over 1.3 million tourists came to California from the United Kingdom and Germany in 1999 and spent over a billion dollars. Over half of the tourists indicated visiting national parks, or hiking and camping as part of their California experience (California Technology, Trade and Commerce Agency, 2000a).

Elements of a global economy and information network

California and the United States operate in a global economy and information network. A number of factors transcend all aspects of the economy and both directly and subtly affect the context of forest and rangeland issues. Significant factors include:

- simplified worldwide trade through information networks;
- worldwide production networks;
- multinational corporations;
- technological innovation/R&D;

- world banking and monetary structure;
- global capital flows/FDI; and
- venture capital flows

Worldwide trade and information networks

International trade is increasingly facilitated by the growing electronic information structure that essentially reduces the cost and time delays between different clients and producers. The electronic information structure includes satellites, laser fiber optics, lap top computers, cell phones, and the Internet. This infrastructure connects multinational firms, ties customers and suppliers more closely together, and facilitates movement of global investment capital. In effect, it creates a global production, market, and sales mechanism. Businesses operate in an international market place; consequently, they are forced to reduce transaction costs, improve product quality, and provide better customer service. This puts a premium on business structures that are flexible and emphasize innovation and creativity.

The Internet and related technologies are facilitating trade and transforming social patterns; strengthening links between citizens and their communities; and improving the opportunities for economic and social development. This is especially noticeable in e-commerce. "E-commerce" refers to conduct of commercial and non-commercial activities by use of information network technologies, such as the Internet, intranets, and extranets.

California is a center for the development of e-commerce. The State has passed laws and funded programs to facilitate e-commerce. Companies in California have been key in the invention and adaptation of Internet applications. Even after the recent "dot com" implosion, there are hundreds of Internet-related companies in the State. Reflecting this fact, the California economy has moved from a manufacturing-based economy to a knowledge-based economy. Almost every industry has been affected by the Intranet and related technologies. The result has been substantial reorganization of the business and financial services in the State (Electronic Commerce Advisory Council, 1998).

Use of the Internet and the e-business world are changing how the pulp and paper industry operate (see sidebar "Pulp and paper industry adapting to e-business"). This can be seen in product demand shifts, such as diminishing demand for newsprint or the increasing demand for office paper. It can also be seen as the industry is forced to shift from a model that emphasized maximum production (goals for units produced) to a focus on customers. Companies are using Internet technology to better comprehend, attract, and serve their customers. Successful firms are developing business models that place the customer at the center of their business.

Pulp and paper industry adapting to e-business: According to accounting firm PricewaterhouseCoopers, the pulp and paper industry is well situated to adapt to e-business, but has been slow to do so. It is in the early stages of exploring with digital advertising, buying, and selling. However, it has not moved quickly to integrate with customers and suppliers, to restructure operations around the customer relationship, or to develop new service alliances with other industries (PricewaterhouseCoopers, 2000). One example of e-business in the forest products industry is the March 2000 International Paper, Georgia-Pacific, and Weyerhaeuser agreement to jointly create an independent, global on-line market place. It has since been joined by other companies. Services include systems and trading partner integration, catalog content management, marketplace services including private trading exchanges, and professional services. The company also operates an industry marketplace that brings application services to support forest products industry members. Given this example and the traditional fragmentation in the industry, it is likely that similar ventures will develop between other firms in the pulp and paper industry, as well as closely related industries.

Multinationals and a worldwide production network

In a global economy, production of goods and services occurs worldwide. This is facilitated by global banking and financial services; movement of foreign investment capital; creation of far-flung trade and distribution networks; and fast and reliable transportation and communication. In effect, there is a worldwide labor pool that is stable, qualified, and relatively low cost.

Multinational firms strongly influence the world economy. More than 40 percent of U.S. imports and 35 percent of U.S. exports go between parent and related companies. Examples of industries where five firms control 40 percent of the global market include: consumer durables, automotive, airlines, aerospace, electronic components, electronics, steel, and oil (Koehler, 1999). Relative to forest and rangeland industries, there is substantial concentration in meat processing and a growing concentration in global production of some wood products.

Production of goods involves the following: R&D; designing, obtaining and establishing production equipment and facilities; and carrying out production. Increasingly, multinational corporations compete based on their ability to coordinate international activities and to use their collective information and organizational base. Multinational corporations achieve advantages by having a network of subsidiaries whose management is coordinated globally. In practice, the world trade arena is based on a connection of multinationals and their associated networks across geographic regions (Kogut, 1998; Zarsky, 1998). The pattern for many U.S. firms is to do R&D and more capital intensive processing, production, or assembly in the U.S. and to send more labor-intensive work to lower-cost work forces in other countries. This is also true for several industries in California, including apparel and microelectronic components.

Technological innovation/research and development as an economic force

The modern world economy is driven by innovation. The process of innovation involves invention—*inventing a new idea or concept*; innovation—*refining and applying the concept on a limited scale*; and diffusion—*applying the idea or concept more broadly* (Resetar, et al., 1999) (see [Technology Forces at Work](#)). This process values creativity and related conceptual and analytical skills. For agriculture and natural resource industries worldwide, these skills can take raw material from many locations and by means of technology produce quality products. This means that economic activity no longer relies as

much on location of natural resources and agricultural lands for competitive advantages. Competitive advantage in these industries, as well as most others, comes from innovation and creativity. R&D plays a key role in technological innovation and competitiveness in economic growth. During the last two decades, a number of countries, including the United States, Japan, Germany, the United Kingdom, France, South Korea, and China, have invested in research-intensive industries (Rausch, 1998b) (see [National Science Foundation](#)). There is also increasing international cooperation on R&D. This cooperation is spurred by both common problems and budget limits (Wagner, 1998) (see [International Cooperation in Research and Development](#)). The most common form of cooperation is multinational collaboration.

During the last two decades, the United States has developed a complicated network of both R&D and science and technology research institutions. This includes the private sector, governmental agencies and labs, universities and the non-profit research sector (Popper and Wagner, 2002). In 1997, it is estimated that about \$206 billion was invested in R&D in the United States. Of this amount, private industry accounted for \$113.3 billion, federal government spent \$62.7 billion, and nonprofit organizations funded \$9.7 billion (Resetar, et al., 1999). Although many communities have an interest in research, federal research activities are heavily concentrated in a few regions of the country. California receives about \$14.4 billion in R&D funding each year, which is the most in the nation. Most of this is defense and space related, with only a small portion directed toward agricultural or forestry-based research.

Since the early 1980s, four research-intensive industries have contributed heavily to global economic activity: aerospace, computers and office machinery, electronics and communications equipment, and pharmaceuticals (Rausch, 1998a). While they have research components, forest and rangeland industries have not invested as heavily in research as these other industries.

The monetary structure

Relative shifts in exchange rates can affect the pricing of products in foreign markets. They can significantly alter the terms of trade in highly competitive international markets such as agriculture. This has been even truer in the last decade because of the removal of trade barriers between countries.

Since 1970, there have been five currency crises: 1971, 1973, 1992, 1994–95, and 1997 (Glick and Rose, 1998) (see [Contagion and Trade](#)). To varying degrees, each international financial crisis has led to large scale flight of capital, devalued currencies, higher interest rates, inflation and declining real GDP or slowed economic growth in affected countries (Glick and Hutchinson, 1999).

Shifting import and export patterns can also arise from changes in relative currency values. This can have both short-term and long-term impacts. Exports may decrease from countries with higher valued currencies. For example, in 1997, financial instability and depressed world commodity prices caused a decline in U.S. agricultural exports (about 23 percent in real terms and 15 percent in nominal terms from fiscal 1997 to fiscal 1999) and lowered costs for imports (Economic Research Service, 2000a). This lowered income to farmers, including California, and increased the number of agricultural imports to the United States.

Global banking and foreign capital flows

Investment capital comes from sources all over the world. Private international investment flows are the predominant source of capital in the global economy. Between 1990 and 2000, FDI outflows grew almost five-fold from about \$200 billion to nearly \$1 trillion (Nautilus Institute, 2002).

Global investment is rapidly consolidating. This trend reflects regional market restructuring such as the European Union. Risk has increased and return on investment has decreased for global banks. International competition from various mutual and other fund investors is also driving these changes (Koehler, 1999).

California is the leading state for FDIs in the United States. In 1997, for example, total FDIs in California were \$91.8 billion, which was 10.6 percent of all FDIs in the United States (\$866 billion). Employment in California associated with this investment was 569,400 jobs, which is 11 percent of the U.S. total associated employment.

In the 1990s, the framework for foreign investment in California shifted from direct investment toward more partnerships and equity investment. In 1990, foreign investment emphasized direct acquisition of sales offices, real estate holdings, and manufacturing facilities. Little of this investment was directed at the forest and rangeland related industries. By 2000, there was much more emphasis on joint ventures and strategic partnerships where international companies buy into or acquire established companies to gain a market foothold (California Technology, Trade and Commerce Agency, 2000b).

Only a few U.S. banks are involved in export finance. Consequently, lack of financing hinders many small businesses from international trade (Gersick, 2000). The federal government tries to encourage small businesses to export by offering financing programs through the Ex-Im Bank, the Small Business Administration, and the Overseas Private Investment Corp.

According to the California Trade and Commerce Agency requests for joint venture, partnership and matchmaking services have risen markedly in the last few years. The Agency's response has been a refocused foreign investment assistance program that prioritizes and identifies cross-border partnering deals. This has changed California's international commercial landscape and has the opportunity for growth among smaller companies.

Capital flows to rural California in many ways. Aside from government grants and programs, banks are key distributors of capital. Increased presence of foreign banks has added to the centralization of banking in rural America including California. Rural California, like much of rural America is characterized by its wide diversity, the close interconnection between urban and rural economies, and the significance of non-agricultural business as a source of growth. Branch banks from larger national or international banks are often found in rural California counties, though the loan profile may well be dominated by non-agricultural loans (Gilbert, 1997; Castle, 1997) (see [The Financing of Rural America, Implications of Banking Consolidation, and Improving Rural Capital Markets](#)).

Venture capital movement

Venture capital has keyed rapid development and application of new technologies. These investments usually focus on development of small companies with promising technologies and products. They hence tend to be long term, of higher risk, and of higher profit to the investor. In Europe, venture capital has been focused on industrial machinery and equipment, fashion, and sporting goods (Rausch, 1998b). For example, more than 30 percent of all venture capital investments in 1995–96 were in companies providing industrial products such as machine tools, pollution control and recycling equipment, high fashion clothing and other consumer products.

In contrast, in the United States and California, venture capital has been much more centered on formation and expansion of high tech companies. For example, in the United States, computer technology business (including software development) has attracted just over 30 percent of venture capital expenditures.

Many states have recognized the importance of groupings of high tech industries. These provide high wage jobs, attract investment, and promote economic growth. Certain conditions are essential to attract and support high tech industries. These include a dynamic R&D base, a pool of creative technical talent, and available investment capital. States vary greatly in their roles in fostering these conditions. California is much better than average, especially for its funding inflows, capital investment/business assistance, and the technology intensity of its business base (U.S. Department of Commerce, 2000).

Final observation

California's first Forest and Rangeland Assessment in 1978 did not cover world or national trends in detail. The 2003 Assessment cannot avoid it. Forces that influence forest and rangelands in California are increasingly related to what is going on at a global scale. For example, the increased integration of global timber markets is reducing the role of domestically produced timber, reducing the historic positive trend in timber prices, and introducing higher environmental standards based initially on consumer preferences and willingness to pay an environmental premium in Western Europe. Integration of global cattle markets is another example of how increased trade can affect the local economic viability of large ranches. Finally, the increased global integration is promoting the diffusion of many high technology businesses in forest and rangelands of California. Global information and trade flows are at the center of many of these influences and will need to be evaluated in detailed regional economic or ecosystem discussions in the Assessment.

Glossary

CUSTA: Canada–U.S. Free Trade Agreement.

FDI: Foreign direct investment.

GATT: General Agreement on Tariffs and Trade.

GDP: See **gross domestic product**.

gross domestic product: The total market values of goods and services produced by workers and capital within the U.S. borders during a given period.

IUCN: The World Conservation Union.

NAFTA: North American Free Trade Agreement.

NGO: Nongovernmental organization.

Phytosanitary action: An official operation, such as inspection, testing, surveillance or treatment, undertaken to implement phytosanitary regulations or procedures

R&D: Research and development.

SPS: Sanitary and phytosanitary.

TBT: Technical barriers to trade.

WTO: World Trade Organization.

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