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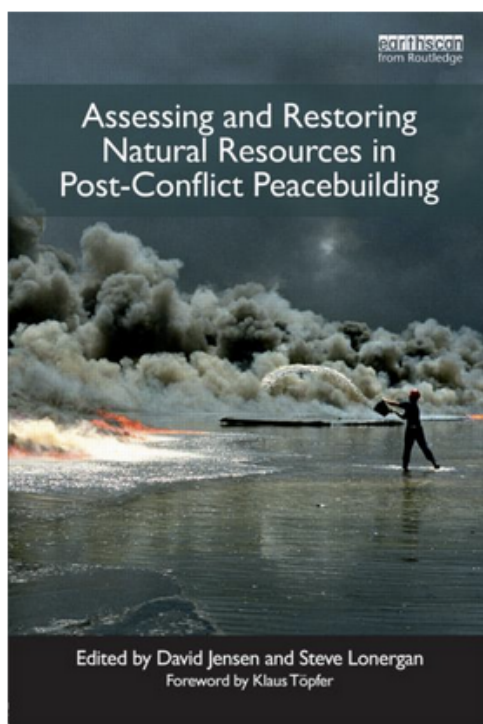
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**Making best use of domestic energy sources: The Priority Production System for coal mining and steel production in post-World War II Japan**

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# **Making best use of domestic energy sources: The Priority Production System for coal mining and steel production in post–World War II Japan**

*Mikiyasu Nakayama*

For Japan, World War II ended with its surrender in August 1945 and a cease-fire agreement with the Allied Forces in September. Japan was thereafter occupied by the United States until the San Francisco Peace Treaty in September 1951. The six years between August 1945 and September 1951 are generally considered the post-conflict period in Japan.

One of the main reasons Japan entered World War II was to secure sources of energy in Asia and the Pacific region, particularly oil wells such as the Minas oil field on Sumatra in the Dutch colony of Indonesia. Although oil filled only 10 percent of energy needs in post–World War II Japan, it was indispensable to transportation and the military, so the country had to rely on imported oil, as it had before the war.<sup>1</sup> Although there were oil wells on mainland Japan, production of crude oil could meet only a tiny fraction of the country's energy demands.

In the post–World War II period, Japan suffered from an energy shortage. The means for producing domestic coal—Japan's only resort—were destroyed toward the end of the war. Moreover, many immigrant coal miners from former colonies (particularly Korea) went home shortly after the war.

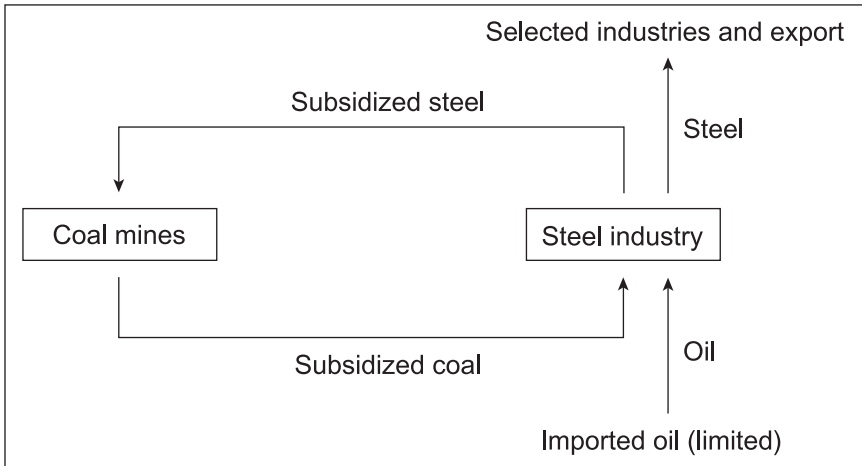
Because coal fueled civilian activities and industry, including production of fertilizer and synthetic fiber, the Japanese government introduced the Priority Production System in December 1946 to support the revitalization of domestic coal mining. The system's major aim, after strengthening coal production, was to restore steel manufacturing to drive Japanese industry as a whole. Steel was, in turn, given to coal mines, to help accelerate the extraction of more coal, and to other industrial and export businesses (see figure 1).

The Priority Production System relied on funds from the Reconstruction Finance Bank, which raised money by selling reconstruction finance bonds to the Bank of Japan. The Bank of Japan thus continued to print bank notes,

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<sup>1</sup> Before the war in 1937, coal and hydropower provided 62 percent and 18 percent of Japan's energy needs, respectively (Oba 2009).



**Figure 1. Concept of the Priority Production System in post-World War II Japan**  
 Source: Data from Agency of Natural Resources and Energy (2002).

which led to inflation. Then, in the mid-1950s to 1960s, with increasing imports of oil and coal, many coal mines closed, and workers lost their jobs.

This chapter describes how the Priority Production System was developed, why it was accepted so readily by the Japanese, why it was successfully implemented, what it cost, and how other post-conflict societies can learn from Japan's experience.

## THE PRIORITY PRODUCTION SYSTEM IN POST-WORLD WAR II JAPAN

The major objectives of the Priority Production System for economic reconstruction were to stimulate industry and restrain hyperinflation. The government believed that increasing the production of coal, electric power, and steel would improve the economy. With more coal, electric power and marine transportation increased significantly. Industrial production of chemical fertilizer reached 70 percent of its pre-war level by December 1948 (Saito 2000).

Before World War II, some 60 percent of coal was used by industry and 40 percent by other sectors, such as transportation and thermal power. After the war, demand for energy became immense; therefore, increasing domestic coal production for industry became critical (Johnson 1983). In 1947, the coal and steel industries were prioritized. Beginning in 1946, approximately 20 to 30 percent of the general account budget was devoted to priority production in the form of price subsidies and indemnities for losses (see table 1). Because many workers from former colonies went home after the war, Japan had a serious shortage of labor. The few remaining miners received food and housing benefits in exchange for working extended hours in a three-shift, twenty-four-hour schedule (Johnson 1983).

**Table 1. Price subsidies and indemnities: Government payments and percent of general account budget, Japan, 1940–1952**

Year	(Million yen)					
	Total general account budget expenditures		Price subsidies (kakaku chōsei hi)		Indemnities for losses (sonshitsu hoshō hi)	
1940	5,856	(100%)	17	(0.3%)	60	(1.0%)
1941	7,929	(100)	95	(1.2)	55	(0.7)
1942	8,271	(100)	305	(3.7)	240	(2.9)
1943	12,491	(100)	510	(4.1)	265	(2.1)
1944	19,872	(100)	1,266	(6.4)	567	(2.8)
1946	115,207	(100)	3,731	(3.2)	22,661	(20.0)
1947	205,841	(100)	28,178	(13.7)	8,566	(4.2)
1948	461,974	(100)	93,118	(20.2)	16,632	(3.6)
1949	699,448	(100)	179,284	(25.6)	31,838	(4.6)
1950	633,259	(100)	60,162	(9.5)	7,830	(1.2)
1951	749,836	(100)	26,975	(3.6)	9,560	(1.3)
1952	873,942	(100)	40,308	(4.6)	8,183	(0.9)

Source: Johnson (1983).

Priority production proved successful by 1948. Coal production recovered in 1948 to about 60 percent of its highest level during the war (Johnson 1983). The Economic Stabilization Board stated in its first economic white paper, published on July 22, 1947, that a two-fold increase in coal production would lead to a four-fold increase in general manufacturing (Johnson 1983). Economic recovery was accelerated as more industries were included in the Priority Production System. Electricity was prioritized in November 1947, the railway in January 1948, and chemical fertilizers (especially ammonium sulfate) in March 1948 (Nakamura and Odaka 2004). In the 1948 fiscal year, production nearly met or (in many instances) exceeded targets, with 97 percent for coal, 94 percent for steel, 102 percent for ironware, 101 percent for ammonium sulfate, 115 percent for electric power, 110 percent for caustic soda, 113 percent for cement, and 67 percent for cotton thread. Coal, steel, and ammonium sulfate recovered to pre-war levels in 1948, 1950, and 1947, respectively (Nakamura and Odaka 2004).

### **Inflation: The cost of the Priority Production System**

Immediately after World War II, the production base in Japan was disorganized, and the government lost control of commodity prices. Inflation accelerated toward the end of the war; the highest price increases occurred in 1946, the year after the war ended (see table 2) (Saito 2000).

The Priority Production System made prevailing inflation worse, and countermeasures were necessitated. Accordingly, in 1949, Joseph Dodge, finance advisor to General Douglas MacArthur who led General Headquarters (GHQ, the occupation forces of the United States), advised the Japanese government to balance the budget. Through implementation of what became commonly known as the

**Table 2. Inflation rate, Japan, 1944–1955**

	<i>Inflation rate by year</i>					
	<i>1944</i>	<i>1945</i>	<i>1946</i>	<i>1947</i>	<i>1948</i>	<i>1949</i>
Wholesale price	13.3	51.0	364.5	195.9	165.6	63.3
Consumer price	n.a.	n.a.	n.a.	125.3	75.9	25.6
	<i>1950</i>	<i>1951</i>	<i>1952</i>	<i>1953</i>	<i>1954</i>	<i>1955</i>
Wholesale price	18.2	38.8	19.6	0.7	-0.7	-1.8
Consumer price	-4.0	15.2	4.8	7.0	5.9	0.1

*Source:* Saito (2000).

Dodge Line, the Reconstruction Finance Bank suspended lending to firms. Postal rates and the fares on the national railway also increased substantially (Saito 2000). The Japanese government enforced tax collection, cut expenditures to balance the budget, decreased the volume of the Bank of Japan notes, progressed remarkably in abolishing commodity and price controls, and increased productivity.

### **Unequal distribution of wealth**

Some criticize the Priority Production System on the grounds that it maintained or led to unequal distribution of wealth. Socialist Kihachiro Kimura insisted that the Priority Production System only served the interests of the “capitalist class.” He argued that inflation was due to floating capital during the war and unfair profits made during priority production. He maintained that the Japanese government was obliged to eliminate inflation at the expense of business interests, and that concentration on steel and other industrial production provided capitalists a way to earn money with ease (Kimura 1947).

Hiromi Arisawa, an economist and later a professor at the University of Tokyo, developed the Priority Production System and advocated it to Prime Minister Shigeru Yoshida. Arisawa specialized in Marxist economics while serving as an economist in the Japanese army during World War II. He was thus knowledgeable about the Japanese economy during the war, when Japan was under a military government. Prime Minister Yoshida relied upon Arisawa and decided to implement priority production, even though the Japanese viewed Arisawa as a “red economist.” Arisawa, who was not expected to back the capital class, maintained that the system would revitalize the Japanese economy. He was against a tight monetary policy and believed that industrial production should be given the highest priority (Gao 1997).

Criticisms of the Priority Production System reflected the rapidly changing ideological environment of Japan just after the war. Ideas of social equity and balanced distribution of wealth had been suppressed from the early 1930s to the end of the war. After the war, criticisms were not strong enough to change the wartime ideology of Japanese industrial policy (Gao 1997). But ideological imbalance in a post-conflict society may be inevitable.

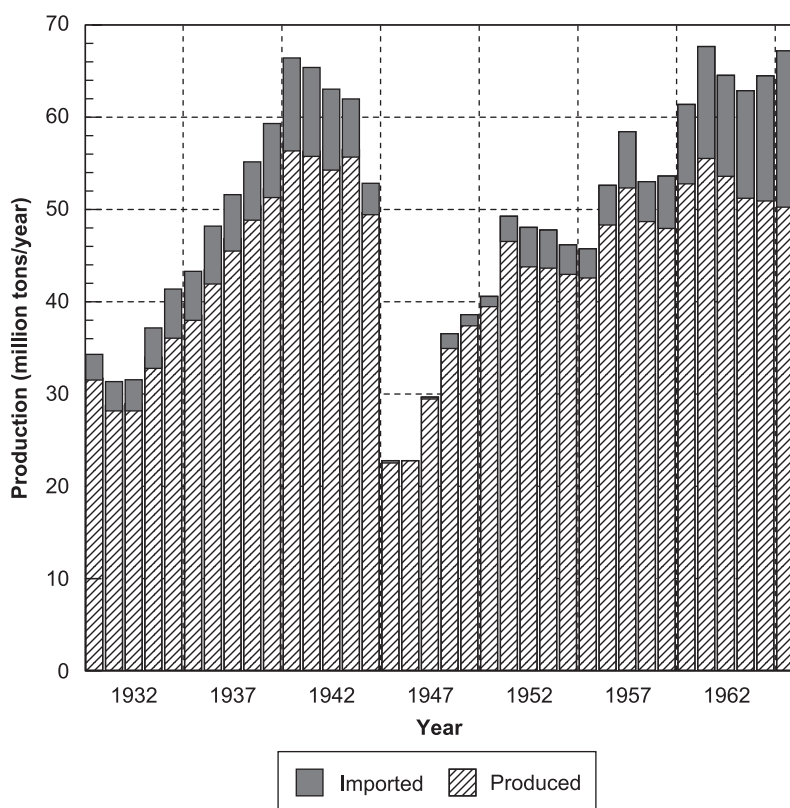


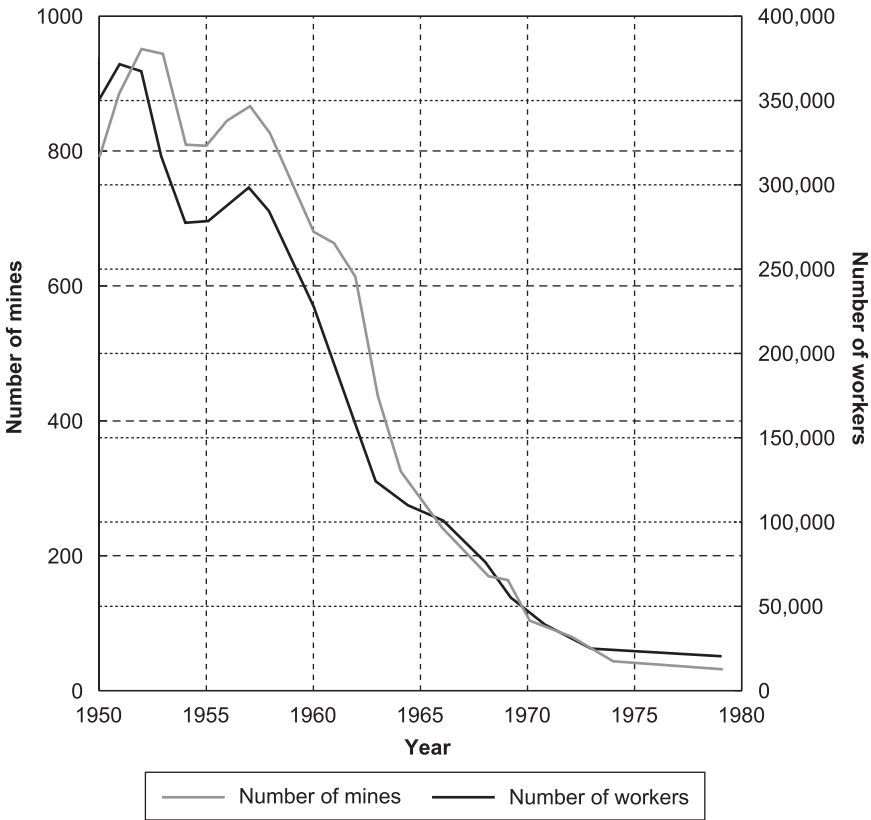
Figure 2. Domestic production and imported coal, Japan, 1930–1965

Source: Data from Agency of Natural Resources and Energy (2002).

### Massive unemployment of coal miners

Once the balance of payments improved in the late 1950s, Japan began to import cheaper and higher-quality coal (see figure 2). Because there was less demand for domestic coal, Japanese coal mines were adversely affected. As coal mines closed from the 1950s to the 1970s (see figure 3), unemployment increased, leading to social unrest and many strikes.

Most former coal miners were absorbed by other sectors while Japan enjoyed rapid economic growth in the 1960s and 1970s. The Temporary Law to Deal with Redundant Coal Miners was adopted in December 1959 to adjust the labor-market structure by encouraging worker turnover. The policy prompted many laborers to move to manufacturing, lowering and stabilizing unemployment. Thereafter, no substantial employment policies were implemented (Ohtake 2004).



**Figure 3. Number of coal mines and workers, Japan, 1950–1970s**  
 Source: Data from Agency of Natural Resources and Energy (2002).

**FACTORS THAT AFFECTED THE SUCCESS OF THE PRIORITY PRODUCTION SYSTEM**

One of the main prerequisites for successful implementation of the Priority Production System was strong governmental control of the national economy. In other words, the Priority Production System was essentially a socialist planned economy, not a free economy. It was also based on the recovery of heavy industry, with steel production constituting the major component. Such an industry-based, socialistic system was made possible by several factors.

First, Japanese citizens were accustomed to a planned economy before and during the war. Thus the Japanese expressed no strong objection to the Priority Production System. Civilian use of oil had been strictly controlled since 1938, when the Japanese government enacted the Revised Materials Mobilization Plan to control many strategic materials. For example, free commercial transactions of gasoline, coal, and rice were prohibited; people had to use government

vouchers to purchase them. Later, during the war, civilians were not allowed to purchase gasoline.

Second, before the war, Japan constructed military vessels and met other military and civilian needs through heavy industry. After the war and as a means to accelerate economic recovery, Japan's reliance on heavy industry continued. Provision of coal and steel were thus essential to revitalizing heavy industry. Technically knowledgeable and highly skilled engineers, who had survived the war, promoted the recovery of Japanese heavy industry. Shortly after the war, there were few miners and industrial workers because men had been drafted. The labor shortage was resolved by employing up to 6 million ex-soldiers and Japanese workers who had returned from former colonies to mainland Japan.

Finally, although the Priority Production System relied on coal, industry and civilians still needed oil. To meet the demand, the GHQ organized the Petroleum Advisory Group (PAG) shortly after the war in October 1945. American oil companies, such as Cal-Tex and Shell, participated in PAG. The GHQ provided the Japanese with petroleum products as part of its emergency aid program as early as November 1945 and light oil in December 1945 to cope with the first winter. Assistance given by the United States, the occupier, was therefore instrumental.

## **LESSONS LEARNED**

The success of the Priority Production System was due to several factors:

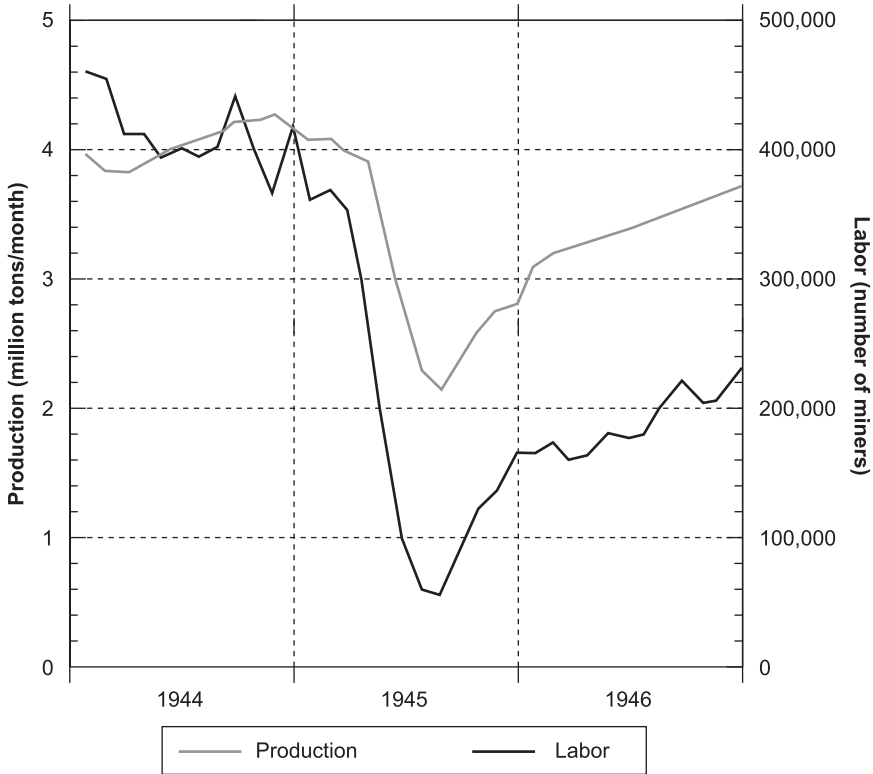
- The use of coal—a domestic energy source—fueled the steel industry and other sectors before and during World War II.
- Although production of coal was severely hampered during the war (see figure 4), the technical resources for coal mining survived the conflict.
- The lack of labor shortly after the war was resolved by employing ex-soldiers and Japanese workers who had returned from former colonies.
- The Japanese population was accustomed to a planned economy before and during the war, so the Priority Production System was not disconcerting.

Post-conflict societies may benefit from making good use of domestic energy sources when imported ones are lacking. Unlike in Japan after World War II, a heavy industry–driven economy may not be feasible in all countries emerging from conflict. Still, domestic energy sources have advantages over imported ones. Intensive use of domestic energy sources might also conserve hard currency, which is often lacking in post-conflict countries.

Developing, and especially post-conflict, countries usually lack technical resources to make the best use of domestic energy. Donor countries and organizations should thus give full support to expanding technical resources in the energy sector and help train the short supply of workers.

Absorbing excombatants and returning refugees into society is difficult for most post-conflict countries. The Japanese Priority Production System led to





**Figure 4. Monthly coal production and number of miners, Japan, 1944–1946**

*Source:* Data from Agency of Natural Resources and Energy (2002).

employment for 6 million ex-soldiers and civilians. Similar measures could be taken in other post-conflict countries to prioritize labor-intensive domestic energy production (taking into account new technologies to reduce carbon emissions).

Some researchers assume that the Priority Production System was based on the Japanese Revised Materials Mobilization Plan, which was put into effect in 1938 in anticipation of the war (Johnson 1983). For several years thereafter, the Japanese population endured scarcity and strict control of indispensable commodities such as oil. Consequently, they could cope with yet another planned-economy scheme.

Other analysts argue that the Priority Production System was not that effective. Critics point out that the proliferation of underground markets in post-conflict Japan indicated that the Japanese government had failed to control the material flows on which the Priority Production System was based. Still, critics generally assume that the Japanese economy would not have recovered as rapidly as it did after the war without the Priority Production System. Perhaps the key lesson is

that post-conflict societies should consider stronger control of some aspects of their economies in the early recovery period rather than relying solely on the free market.

## CONCLUSION

The Priority Production System was successful in post–World War II Japan. Countries that implement their own priority production systems should be familiar with government-controlled economies.

Defeated countries might rationally take advantage of domestic resources and give priority to certain industries or sectors, especially when they cannot obtain imports. Priority production tends to require money and human resources, so countries should adopt policies to absorb surplus manpower, such as former soldiers and refugees. Governments also need to consider how to employ the same populations in other sectors when priority production systems end.

The massive unemployment and hyperinflation observed in post-conflict Japan revealed the risk of short-term solutions like the Priority Production System. Societies should understand that priority production systems are emergency government measures, and governments may need outside advice, as Japan received. Because the Priority Production System was a large-scale experiment carried out in a defeated country, it might serve as an interesting and stimulating example for other post-conflict societies.

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