



EAST-WEST
CENTER

EAST-WEST CENTER

Occasional Paper

Turning Back the Clock:

The Changing Nature of North Korean Food Insecurity

Marcus Noland

East-West Center and the
Peterson Institute for
International Economics

NUMBER

8



TURNING BACK THE CLOCK: THE CHANGING NATURE OF NORTH KOREAN FOOD INSECURITY

MARCUS NOLAND

East-West Center and the Peterson Institute for International Economics

ABSTRACT

Over the past several years, North Korea has adopted legal changes that are increasing the centrality of the Workers Party of Korea and the state in agricultural production, distribution, and consumption. This development changes the basic nature of food insecurity in North Korea from one in which access to food is determined by the ability to purchase it in the market to one in which access to food is determined by political status. This development is of potential policy relevance: Although current conditions do not appear to be severe, if and when North Korea experiences another food crisis, foreign partners are likely to encounter a state-dominated model more closely resembling the system that existed in the early 1990s at the onset of the famine and with it the attendant problems that humanitarian-relief agencies confronted at that time.

KEYWORDS: FAMINE, FOOD SECURITY, FOOD PRICES, NORTH KOREA, ENTITLEMENT

JEL CATEGORIES: Q1, P3, P32, P36

ACKNOWLEDGMENTS: *I would like to thank Lucas Rengifo-Keller and Jing Yang for research assistance, and Bill Brown, Nick Eberstadt, Ben Katzeff Silberstein, Lee Sang Yong, Grant Marcinko, Nam Jinwook, Bill Newcomb, Jack Rendler, Peter Ward, and seminar participants at PIIE and George Washington University for helpful comments on an earlier draft.*

The **East-West Center** promotes better relations and understanding among the people and nations of the United States, Asia, and the Pacific through cooperative study, research, and dialogue. Established by the US Congress in 1960, the Center serves as a resource for information and analysis on critical issues of common concern, bringing people together to exchange views, build expertise, and develop policy options. The East-West Center in Washington provides US and Indo-Pacific government stakeholders and program partners with innovative training, analytical, dialogue, exchange, and public diplomacy initiatives to meet policy priorities.

1. INTRODUCTION

For much of its history, the Democratic People's Republic of Korea, or North Korea, was a classic centrally planned economy in which the state owned the means of production and orchestrated production, distribution, and consumption through a state-administered plan. North Korea was notable only in the rigor with which markets, and economic activity outside the plan, were repressed.

That system began to fray in the 1980s. In the 1990s, the country experienced a devastating famine that led to an unplanned, bottom-up marketization of the economy. Given the unintended nature of this evolution, the regime has never been entirely comfortable with the market and has not built the foundational institutions of a modern market economy. In the intervening years, policy has gone through cycles of relaxation, effectively ratifying practices on the ground, followed by reassertion of state control.

At present, North Korea appears to be going through one of those cycles of recentralization, particularly in the food economy. Over the past several years, it has adopted legal changes that are increasing the centrality of the state in agricultural production, distribution, and consumption. This development is changing the basic nature of food insecurity in North Korea from one in which access to food is determined by the ability to purchase it in the market to one in which access to food is determined by political status.

The current efforts to reassert state control over the food economy appear to be more fundamental than in the recent past, in effect seeking to turn back the clock. This development is of more than purely intellectual interest: If and when North Korea experiences another food crisis, foreign partners are likely to encounter a state-dominated model more closely resembling the system that existed in the early 1990s at the onset of the famine, and the attendant problems that humanitarian-relief agencies confronted at that time, than the more market-oriented system that emerged after the famine.

2. BACKGROUND AND CONTEXT

When Japan colonized Korea in the early 20th century, the northern, resource-rich part of the peninsula industrialized, with the southern part functioning as the breadbasket. Following partition in 1945, North Korea adopted a Soviet-style, centrally planned economy. Following the Korean War (1950–52), the leadership made the fateful decision to pursue the understandable goal of national food security through an economically irrational strategy of self-sufficiency. Indeed, beginning in 1959, policy went beyond national self-sufficiency to encourage *provincial* self-sufficiency where possible.

The conditions were, and remain, inauspicious. North Korea is mainly mountainous (only 17 percent of the land is arable), and the ratio of arable land to population is low. Climatically, North Korea is relatively cold because of its northerly latitude and prevailing winds from Siberia. Growing seasons are short, limiting the scope for double-cropping. About 30 percent of arable land is devoted to rice paddies, though the environmental conditions are unfavorable for growing this crop.

On the supply side, agriculture was collectivized into state-run “cooperative farms.” Apart from the co-ops, there is a separate category of “state farms,” mainly orchards, but this is a distinction without a difference: In both institutions, the cultivators are effectively state employees with little autonomy. Decision making was centralized, and farmers were subject to micromanagement down to things such as the approved distances between plants and the precise dates that crops were to be planted and harvested. The system embodied few material incentives.

To compensate for the unfavorable natural conditions, North Korea developed an agricultural system based on the intensive use of industrial inputs such as fertilizers, insecticides, fungicides, plastic sheeting, and electrical- and diesel-driven irrigation systems. To get a sense of scale, in the 1980s, according to Food and Agricultural Organization data, North Korean application of fertilizer per hectare was among the highest in the world, more than three times that of the United States, and nearly as high as Japan’s.

Continuous cropping driven by the imperative to maximize output led to soil depletion and compensatory overuse of fertilizer to soil acidification, eventually contributing to a decline in yields. As yields fell, to maintain output in absolute terms, hillsides were denuded of trees to bring marginal land under cultivation. This action contributed to soil runoff and the silting of rivers, canals, and reservoirs, ultimately reducing the water-carrying capacity of the land. These developments, in turn, exacerbated seasonal flooding associated with summer monsoons.

Both the production of fertilizer and operation of the irrigation systems were dependent in significant part on the importation of oil, which came mostly from the Soviet Union on concessional terms. The system was vulnerable to disruption in the supply of industrial inputs and key imports.

Grain produced on the cooperative farms was then collected and distributed through the public distribution system (PDS), a centrally orchestrated plan that involved transporting grain via rail predominately from breadbasket areas in the southwest to high-population/low-production industrial areas in the northeast, and especially the capital city of Pyongyang and military facilities.

On the demand side, grain (and indeed most consumer goods) was distributed through the PDS quantity-rationing system, in which households were assigned monthly allocations determined by

household size, composition, and occupational characteristics.¹ Households accessed grain at local public distribution centers (PDCs), which effectively functioned as retail outlets. Prices were nominal, fixed by the central authorities, and did not signal scarcity values.

This system began to fray in the 1980s, when the Soviets cut off aid and started to demand repayment for arrears. The North Korean leadership did not appear to grasp the epochal change around them. Vietnam experienced the same withdrawal of Soviet assistance and adjusted with its *doi moi* reforms, placing an emphasis on exports. But the North Koreans stood pat.

The collapse of the Soviet Union and the dissolution of the Eastern bloc in 1991 was a catastrophic blow. Trade with the USSR, which had accounted for more than half of North Korea's two-way trade, fell by the equivalent of 40 percent of North Korea's global imports. By 1993, imports from the USSR were 10 percent of their previous level. Between 1990 and 1991, the volume of oil imports from the USSR fell by more than 75 percent.²

Battered by external shocks, the North Korean economy began to shrink, and, deprived of industrial inputs, agricultural production began falling. By the mid-1990s, the already frayed PDS system had collapsed for the non-elite population.³

Normally at this juncture, a country could pursue a number of policy options. The state could have sought international aid, and indeed, in 1991, North Korea had a half-hearted engagement with the World Food Programme (WFP). But it was not until 1995, with a famine under way, that the North Koreans sought assistance first from Japan (which could be portrayed as reparations), then from South Korea (which could be portrayed as political tribute to the Kim regime), and then from the UN agency. Food aid, channeled via the WFP, eventually became a component of diplomatic engagement, even with the US. Yet as recently as 2023, when the country was reportedly experiencing hunger-related deaths, the *Rodong Sinmun*, the newspaper of the Central Committee of the Workers Party of Korea (WPK), likened aid to "poison candy" and stressed the need for self-reliance.⁴

Another short-run mechanism for obtaining food would have been to borrow money on international markets to finance grain imports. However, in 1975, North Korea had defaulted on its international debts (mostly owed to Japanese and French banks) and was shut out of commercial borrowing in

¹ In addition, North Korea maintains a detailed formal political classification system based on characteristics such as a family's status under Japanese colonialism, participation in anti-colonial activities, family members living abroad, and so on. Although PDS rations do not appear to have been directly conditioned on *songbun* classification, the system indirectly affected access to food by circumscribing occupational and geographic-residence options for those whose *songbun* classification placed them in the "hostile class."

² Marcus Noland, *Avoiding the Apocalypse: The Future of the Two Koreas* (Washington: Institute for International Economics, 2000).

³ Stephan Haggard and Marcus Noland, *Famine in North Korea: Markets, Aid, and Reform* (New York: Columbia University Press, 2007); Stephan Haggard and Marcus Noland, *Witness to Transformation: Refugee Insights Into North Korea* (Washington: Peterson Institute for International Economics, 2011).

⁴ Human Rights Watch, "'A Sense of Terror Stronger Than a Bullet': The Closing of North Korea 2018–2023" (2024), 124, <https://www.hrw.org/report/2024/03/07/a-sense-of-terror/stronger-than-a-bullet-the-closing-of-north-korea-2018%E2%80%932023#:~:text=The%20report%20describes%20the%20numerous,lives%20of%20many%20North%20Koreans.>

international markets. Nor had it joined the International Monetary Fund (IMF), World Bank, or Asian Development Bank, so it did not have access to noncommercial international public financing.⁵

A longer-term adjustment strategy would have been to pursue incentive reforms and opening as the Vietnamese did, which would have allowed the country to earn foreign exchange through exports and to finance imports in that way. But North Korea did not pursue this option either.

Instead, it chose to compress consumption. Efforts to reduce consumption had been undertaken in the 1980s, but in 1991, the state launched a “Let’s eat two meals a day” campaign, cutting distributions through the PDS. When the WFP gained access to the country in 1995, PDS rations on paper were already below minimum human needs.⁶

What transpired was a famine that killed perhaps 600,000 to 1 million people, or about 3 to 5 percent of the prefamine population.⁷ Although flooding in 1995 and 1996 contributed to this disaster, it was fundamentally a product of decades of economic mismanagement. If there was a single proximate trigger that sent North Korea over the edge, it was the reduction in Chinese grain exports to North Korea over 1993–94, undertaken in the context of rising world prices and Chinese concerns about the domestic political implications of high food prices.

How the famine unfolded is critical to understanding North Korea today. With the state unable to fulfill its obligations under the existing institutional relationships, small-scale social units—households, work units, local party organs, government offices, and even military units—initiated entrepreneurial coping behavior, much of it technically illegal, to secure food. These coping strategies included foraging and other forms of prohibited movement, and using barter and eventually monetized trade, including transactions with Chinese counterparties, to obtain food.⁸ The marketization that began with food gradually encompassed a broader range of household goods. That process was abetted by repurposing existing institutional arrangements, most prominently “the August 3 campaign for people’s goods” (1984), which was used both by enterprises to shed workers, particularly women, and by workers, who—for a fee—could be classified as August 3 workers and thereby shift from employment in the planned sector to alternative, higher-efficiency activities in the emerging market sector.

Aid played an ambiguous role in this process. It was largely distributed through the PDS, reinforcing state power. Yet it also stimulated the development of market activity. With the real price of food implicitly high, control of supply created the opportunity to capture astronomical rents through diversion and sale—but only if markets existed. That potential opportunity incentivized a constituency within the elite (including within the military) to tolerate, if not actively support, the development of informal markets, which came to be the primary mechanism through which non-elite North Koreans obtained food. These markets eventually received formal sanction, with the restrictiveness of regulation

⁵ In 1997, it hosted an informational mission from the IMF, but according to participants, it lost interest in membership when fund staff explained the process of joining the organization and the data revelation that would be required.

⁶ Haggard and Noland, *Famine in North Korea*, Figure 3.1.

⁷ Some estimates are lower, and some are much higher. See Haggard and Noland (2007) and Suk Lee, “Analysis on 2008 Census of North Korea and Problems” (Seoul: Korea Development Institute, 2011), https://www.kdi.re.kr/eng/research/reportView?pub_no=12403 for discussion.

⁸ In recent years, there has been a profound tightening of security on both sides of the border. It is unclear if the safety valve of decentralized cross-border movement and exchange would be operative in some future contingency.

(who can trade, what products can be traded, what currencies can be used, what times trading is permitted, and so on) waxing and waning.

The crucial issue is that this transformation can best be understood not as an intentional top-down reform, but rather as a bottom-up or grassroots process born out of state failure that the government has sought to both ratify and control *ex post*. In the conceptualization of Nobel laureate Amartya Sen, what began as a socialist famine in which entitlement or access to food was determined by one's political status morphed into a chronic food emergency in which entitlement has been largely determined by the ability to command resources in the market.⁹

Consequently, the state has never been entirely comfortable with the market, which represents an alternative pathway to wealth, status, and, potentially, power that are beyond the state's control, but nor has it built the institutions of a modern market economy. North Korea entered the famine as a centrally planned economy in which food entitlement was politically determined. It exited the famine, in 1998, as a centrally planned economy with a significant market periphery, and in the intervening decades, what has emerged might be described as a highly distorted market economy with an enormous state presence. Increased use of money (both North Korean *won* and foreign currencies) has facilitated the growth of market-conforming activities at the expense of the state sector. During this period, North Korea has gone through cycles of relaxation and retrenchment, typically relaxing control during hard times as a kind of safety valve, and reasserting control in times of confidence.

It should also be stipulated that, paradoxically for a country as centralized as North Korea, there appears to be a fair degree of variation in practices and/or intensity of rule enforcement from place to place. Some of the measures described below could be regarded as an attempt to limit the degree of local variation in practices.

Recent years have generally been regarded as a time of reassertion of central control, though in the industrial sector, some increases in autonomy of state-owned enterprise managers to engage in inter-enterprise exchange (i.e., "the order contract") could be regarded as liberalizing. In the agricultural sector, the emphasis has clearly been on increased central control. Indeed, this process appears to be sufficiently fundamental relative to earlier experiences as to be characterized as an attempt to turn back the clock.

⁹ Amartya Sen, *Poverty and Famines: An Essay on Entitlement and Deprivation* (Oxford: Clarendon Press, 1981).

3. RECENT CHANGES TO THE NORTH KOREAN AGRICULTURAL SYSTEM

North Korea has an abysmal business climate. It is literally dead last (176th of 176) in the most recent Heritage Foundation/*Wall Street Journal* economic-freedom ranking; in the Freedom House ranking, it is 204th of 211; it was not even included in the Competitiveness Index of the World Economic Forum or the World Bank's Doing Business indicators. The agricultural economy appears to be a microcosm of this broader phenomenon.

Pandemic-related border closure beginning in January 2020 accelerated preexisting trends toward greater central control. Leader Kim Jong-un had already called for a “head-on battle to break through” to advance socialist construction and achieve prosperity through self-reliance in his speech at the fifth plenum of the Seventh Central Committee in December 2019. The failed February 2019 US–North Korea Hanoi summit possibly contributed to a sense of opportunities foreclosed and the shift in emphasis in economic policy. The message of self-reliant socialist revival was reinforced at the Eighth Party Congress in January 2021.

In the agricultural sphere, North Korea began amending existing legislation and introducing new laws, a process that took on greater urgency in the context of sanctions- and pandemic-related isolation and falling production. In April 2021, in a speech to the Workers Party of Korea Cell Secretaries, Kim Jong-un invoked the “Arduous March”—code language for the 1990s famine—and subsequent addresses have departed from past practice by emphasizing concerns about the agricultural economy, including his September 2021 speech to the People's Congress and his December 2021 address before the General Meeting of the WPK Central Committee. The result was the announcement, at the end of 2021, of a new agricultural policy, adopting “Socialist Rural Construction Doctrine of the New Era,” emphasizing self-sufficiency and strengthening state control in response to sanctions/pandemic isolation.¹⁰

In terms of actual microeconomic policies and institutions, North Korea established the goal of deemphasizing the production of corn in favor of rice and wheat. There are two non–mutually exclusive possible hypotheses. The first is that cultivation of corn has degraded the soil, requiring application of fertilizer, which was scarce during the period of pandemic closure. Wheat requires less fertilizer and is more amenable to double-cropping. The other hypothesis relates to control: A shift to rice and wheat could strengthen state control because these crops require processing and are less amenable than corn to direct sales to consumers.¹¹ A similar motivation could help explain the post-famine shift by cultivators into potatoes: They can be easily stored and sold directly to consumers.¹²

Parallel to these production decisions, North Korea established the goals of increasing government authority over the purchase and distribution of grain and increasing the volume of grain moving through state-controlled channels. Indeed, in principle, nearly all grain produced by the cooperatives is now

¹⁰ Kim Young Hoon, “Changes in the North Korean Agriculture and Agricultural Policy Before and After the Pandemic,” Ninth Meeting of the Dialogue on the DPRK Economy (Seoul: September 14–15, 2023).

¹¹ It also appears to be the case that the only wheat-processing facility is in the privileged capital, Pyongyang.

¹² There also was state support for the move into potatoes: Under Kim Jong-il, there was a campaign to promote cultivating potatoes (along with raising rabbits and goats).

supposed to go to the state. In addition to vestigial PDCs, the state revived “state stores” or “state grain stores,” essentially in competition with the market.

Among the new and amended laws was the Law on Agriculture (amended 2020), which basically strengthened subnational guidance organizations and reestablished the socialist distribution system in rural areas.¹³ The Law on Farms (amended four times from 2020 to 2021) redefined the cooperative farms as “socialist agricultural enterprises,” specifying roles for farmer and management within the rubric of the “socialist agricultural enterprise” parallel to the legal framework governing industrial enterprises.

The Law on Grain Prices (amended 2021) mandated that farms enter into “Plans for Contract State Purchase of Grain”; tightened the regulation of exchange and sale of free grains; required the use of Agricultural Exchange Centers, per the point above about wheat and rice, thereby limiting the ability of farmers and co-op managers to move grain outside tightly controlled channels; and increased punishments for violators. As Peter Ward characterized it, “Farms continue to be subject to mandatory quotas or allocation plans that require them to sell grain and/or other produce to the state at fixed prices ... any surplus generated that is not consumed by farmers themselves or used in farming activities (seeds, animal feed), cannot be sold on markets. Rather, in the case of grain, it must be sold to the state’s grain allocation institutions, and in the case of other foodstuffs, only sales to state retail institutions are permitted. Such provisions are designed to prevent collective farms and farmers from selling produce from collective farms directly on markets.”¹⁴ This also makes agriculture work like other consumer goods in the “socialist commercial system,” in which the state buys all goods at one price, sells them to the wholesalers at another price, and extracts fiscal revenue through the setting of administered prices (i.e., the turnover tax).

A 2020 amendment to the Law on Farms also recognized small-scale private farming, further codified the responsibilities of the Field Responsibility System, reduced the size of “sub-work teams” to four to six people, and, under production targets, established a fixed-rate tenancy-cum-sharecropping arrangement between the cultivators and the state, apparently involving a 70-30 split in favor of the state once the production target is met. These measures could be interpreted as incentive reforms, at least on paper. But like previous attempts to introduce incentives (similar pilot projects were introduced as early as 1996), this one appears to have been plagued by problems with implementation, unattainable targets, and corruption.¹⁵

Although the reduction in team size should better incentivize effort, it appears that decision-making authority did not devolve in a comparable manner. In effect, the policy appears to push the targets down to work units of smaller size without giving them corresponding autonomy to adjust production techniques, inputs, or the mix of crops. The setting of targets is crucial: If they are set too high, all

¹³ The South Korean National Intelligence Agency has released a compendium of these and other laws running more than 2,400 pages contained in two volumes. For links to the original documents, see <https://www.nknews.org/pro/vast-new-trove-of-north-korean-laws-shines-light-on-developments-in-country/>.

¹⁴ Peter Ward, “North Korea Is Sending Mixed Signals About the State of Its Market Reforms,” *NK Pro*, March 29, 2021, <https://www.nknews.org/pro/north-korea-is-sending-mixed-signals-about-the-state-of-its-market-reforms/>.

¹⁵ Wootae Lee, “How Is the North Korean Food Situation?” 2023, https://www.kinu.or.kr/eng/module/report/view.do?idx=114336&nav_code=eng1691113830; Sang Yong Lee, “North Korea’s Agricultural Policies: Embracing a Chinese Model for Increased Productivity?” *38 North*, March 6, 2024, <https://www.38north.org/2024/03/north-koreas-agricultural-policies-embracing-a-chinese-model-for-increased-productivity/>.

output goes to the state and the farmers are saddled with additional carry-over requirements for the succeeding harvest cycle, and there are numerous anecdotal accounts of precisely this outcome. Moreover, the farmers still depend on the farm managers for inputs, so paradoxically, the reduction in work-team size strengthens the hands of the co-op managers, monopsonist suppliers of inputs, in extracting bribes from the cultivators. Finally, it is worth noting that the very nature of setting these targets at the granular level of individual work teams means that there is likely to be variations in outcomes realized across cooperative farms.

The 2021 Law on Grain Prices amendment clarified that even the free-disposal portion left to farmers could not be sold directly on the market, but rather had to be sold through state channels at state-set prices, reportedly at a 30 percent discount to those prevailing in the market. The law was again amended in 2023 to include both additional incentive reforms and provisions to strengthen state control.¹⁶

The Law Against Institutional Specialization and Selfishness (2021) established central regulation over the practice of enterprises earning profits by engaging in activities outside government control (that is to say, marketization around the plan activity). In the agricultural sector, because the ability of co-op managers to repay loans had been constrained, the practice had arisen of loaning agricultural land to private investors in lieu of loan repayment.¹⁷

The False Report Prevention Law (2022), also known as the Bluffing Prevention Act, covered both the industrial and agricultural sectors (note the amended Law on Farms, which established an equivalence between the industrial state-owned enterprises and the cooperative farms), and contained chapters addressing agricultural and industrial enterprises respectively. The law prohibited false reports of production, distribution, land use, etc., and increased the penalties for violations, including reeducation through labor.¹⁸ These were typical coping behaviors of state-owned enterprise (SOE) managers in planned systems, who, for instance, would hoard output in good times as insurance against failing to fulfill a quota in bad times. Such options were less available to producers of perishable products, but co-op managers normally exhibited similar coping strategies. One ruse toward which the law was aimed was the practice of downwardly falsifying yield reports in order to free up output to repay private investors who had financed co-op input purchases.¹⁹

The net result of these changes was to tighten control over and arguably reduce the flexibility of the production and distribution systems for grain.²⁰

¹⁶ Sang Yong Lee, "North Korea's Agricultural Policies."

¹⁷ See Eugene Whong, "Wealthy North Koreans Refuse Loans to Farms After Government Cancels Farm Debt," *Radio Free Asia*, April 11, 2022, <https://www.rfa.org/english/news/korea/by-hyemin-son-04112022121021.html>.

¹⁸ The main focus appears to be "how much work is done in the planting phase and working the fields, as well as when making forecasts about output, reporting the harvest, and in the fulfillment of consignment plans ... the law addresses the zoning of agricultural land for non-agricultural uses without permission and pretending to introduce new scientific methods without actually doing so." Peter Ward, "Poker Face: North Korea Tries New Strategy in Crackdown on 'Bluffing' and Lying," *NK Pro*, May 19, 2023, <https://www.nknews.org/pro/poker-face-north-korea-tries-new-strategy-in-crackdown-on-bluffing-and-lying/>.

¹⁹ See Son Hyemin, "North Korean Farmers Pressured to Repay Debts Early," *Radio Free Asia*, October 23, 2023, https://www.rfa.org/english/news/korea/farm_debt-10232023155717.html.

²⁰ Not everything was repressive, however. The Law on Administration of Draft Oxen (2021), a.k.a. the Draught Oxen Management Act, legalized the breeding and sale of oxen, a form of agricultural capital, under strict

To spur production, Kim Jong-un committed to increasing resources for the co-ops and writing off co-op debt so that the farms could begin 2022 with a clean slate.²¹ This policy was ratified by a Loan Law (2022).²² The problem had arisen because after the famine, in an era of scarce resources, co-op managers began to borrow money to finance inputs like fuel to operate tractors, repaying the investors in kind after the harvest. But laws that forced all grain into state channels disabled this kind of exchange, and private lenders, who regarded the debt write-off as a confiscatory state taking, were subsequently reluctant to loan to the co-ops.²³ This reluctance was reinforced by the prohibitions contained in the Law Against Institutional Specialization and Selfishness against granting access to co-op land, a method that had arisen out of compensating investors in lieu of payments.

On the demand side, in 2019 North Korea began selling grain through state stores (sometimes referred to as “grain sales offices” or “grain marketing centers”) subject to a per-household quantity limit, with customers prioritized by political status.²⁴ Prices were anywhere from 5 to 40 percent below those prevailing in the market. The discount has changed over time and has not been uniform nationally. (It is worth noting that the concessional component of state-store sales appears to be far smaller than under the PDS system, where prices were nominal.) In trade-policy parlance, this was a tariff-quota system in which customers could purchase food up to a ceiling at the quota price (assuming adequate supply), with additional demand satisfied through the market at higher prices. Normally, supply passing through this system has not been adequate to satisfy demand at the state (quota) price, however, and has been rationed according to political status. The attempt to constitute the state-store system has been

regulatory supervision. See Colin Zwirko, “North Korea Strengthens Financial Control, Tackles E-Payments in New Laws,” *NK News*, November 1, 2021, <https://www.nknews.org/2021/11/north-korea-strengthens-financial-control-tackles-e-payments-in-new-laws/>; Peter Ward, “Don’t Have a Cow, Man? Now North Korean Farmers Can Get One at Oxen Marketplace,” *NK Pro*, April 12, 2023, <https://www.nknews.org/pro/dont-have-a-cow-man-now-north-korean-farmers-can-get-one-at-oxen-marketplace/>.

²¹ The co-op loan forgiveness is attributed to Kim Jong-un’s speech at the Fourth Plenary Meeting of the Eighth Central Committee of WPK, December 31, 2021. See Colin Zwirko and Jeongmin Kim, “North Korea Vows Military Buildup Due to ‘Destabilizing’ Situation on Peninsula,” *NK News*, January 1, 2022, <https://www.nknews.org/2022/01/north-korea-vows-military-buildup-due-to-destabilizing-situation-on-peninsula/>.

²² See Colin Zwirko, “North Korea Enacts New Laws on ‘State Secrets,’ Child Prodigies and Loan Debts,” *NK News*, February 3, 2023, <https://www.nknews.org/2023/02/north-korea-enacts-new-laws-on-state-secrets-child-prodigies-and-loan-debts/>.

²³ See Eugene Whong, “Wealthy North Koreans.”

²⁴ See Seulkee Jang, “North Korea Finally Opens State-Run Food Stores to Little Excitement Among Consumers,” *Daily NK*, June 2, 2021, <https://www.dailynk.com/english/north-korea-finally-opens-state-run-food-stores-little-excitement-among-consumers/>; Richard Finney, “North Korea Restricts Local Markets, Pushing Sales in State-Owned Stores,” *Radio Free Asia*, June 3, 2021, <https://www.rfa.org/english/news/korea/markets-06032021152857.html>; Ishimaru Jiro, “The Kim Regime Shifts Its Food Policy, Suppressing Food Sales in Markets While Creating a State Monopoly on the Food Supply,” *Rimjin-gang*, December 14, 2022, <https://www.asiapress.org/rimjin-gang/2022/12/society-economy/senbai/>; *Rimjin-gang*, “Kim Jong-un Regime Strengthens State-Run Food Store Network to Sell Food at Prices Cheaper Than Markets,” December 23, 2022, <https://www.asiapress.org/rimjin-gang/2022/12/society-economy/kyouka/>; Seulkee Jang, “N. Korea Sells Food More Cheaply Than Markets Through State-Run Food Shops,” *Daily NK*, December 29, 2022, <https://www.dailynk.com/english/north-korea-sells-food-more-cheaply-than-markets-state-run-food-shops/>; Seulkee Jang, “Prices of Rice Sold in N. Korea’s State-Run Food Shops Similar to Market Prices,” *Daily NK*, January 12, 2024, <https://www.dailynk.com/english/prices-rice-sold-north-korea-state-run-food-shops-similar-market-prices/>.

accompanied by a crackdown on sales in the market, in the context of a worse than normal harvest in 2022.²⁵

There are reports that instead of cash, workers at some SOEs are being paid using cards that can be used only in state stores (which increasingly do not accept cash) and not in the market.²⁶ If this is correct, then the state is attempting to incentivize employment at SOEs, control (and potentially monitor) the expenditure behavior of workers, and control the retail distribution of food.²⁷ It is not clear how widespread this practice is.

Apart from control, it is conceivable that the state has a fiscal incentive as well: By forcing food through state-administered channels at state-set prices, the state stands in a position where it can raise more revenue through this system than through one of decentralized exchange largely beyond the reach of the authorities. That said, the discount at which farmers are forced to sell free disposal grain to the state, 30 percent, is of similar magnitude to the discount relative to the market of supplies sold in state stores. Surely price wedges are being imposed through these administered prices, but the magnitude and burden of these fiscal effects are unknown.

Given the state's attempt to exert greater control over grain produced on the co-ops, it is worth asking, from where do supplies in the market originate? There appears to be a variety of sources: voluntary sales by farmers from their own allocations; production from illegal hillside plots; diversion by co-op managers; imports; diversion from the military; and diversion (or resale) from the state stores themselves.

What has emerged is a system that appears in large part to reconstitute the state-control institutions of the prefamine era.

²⁵ Jung Min-ho, "North Korea Tightens State Control of Food," *Korea Times*, June 28, 2023, https://www.koreatimes.co.kr/www/nation/2024/02/103_353863.html.

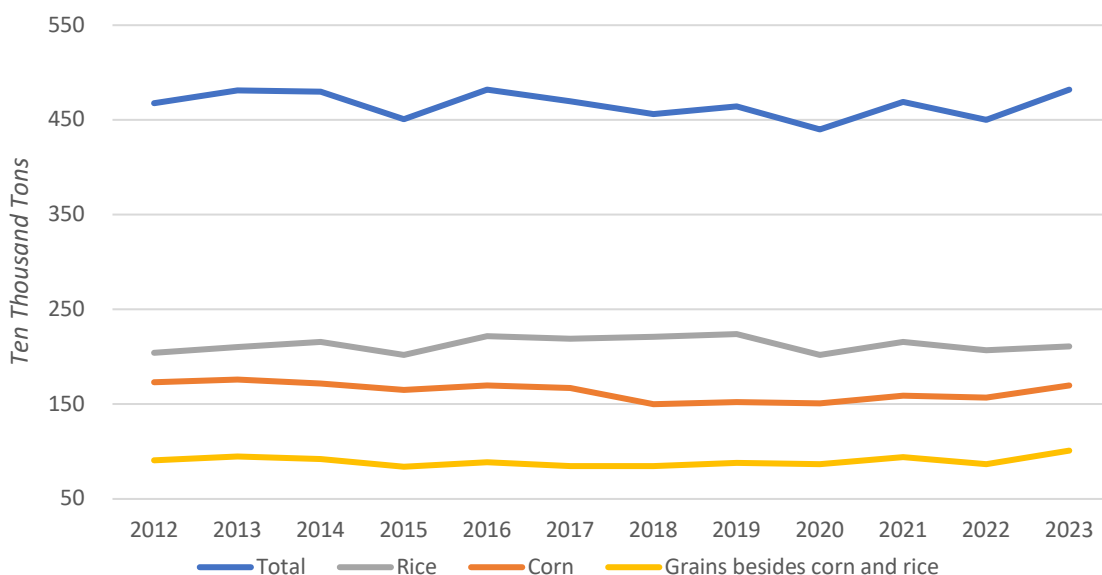
²⁶ Ishimaru Jiro, "Government Implements Wage Hike of More Than 10 Times (1) Wages Increase for Employees of State-Run Enterprises and Government Agencies," *Rimjin-gang*, January 6, 2024, <https://www.asiapress.org/rimjin-gang/2024/01/society-economy/wage-increase/>; Sung Hui Moon and Jieun Kim, "North Korea Boosts Salaries, Introduces Cash Cards for More Currency Control," *Radio Free Asia*, January 17, 2024, <https://www.rfa.org/english/news/korea/cards-01172024143010.html>.

²⁷ There have also been reports of large increases in the salaries of some SOE workers. It is not clear how widespread this has been, and whether these were increases in base salaries or bonuses. The law on maximum-possible bonuses relative to base salary was liberalized, and a shift away from the base-salary component and toward the bonus component of total remuneration could be seen as consistent with making wages more incentive-oriented or market-conforming.

4. OUTLOOK

There is considerable uncertainty around the current degree and nature of food insecurity in North Korea. Anecdotal accounts of hunger-related deaths are relatively common, and in 2023, the WFP reported that between 2020 and 2022, the prevalence of undernourishment had reached 46 percent of the population.²⁸ Yet on the back of favorable weather and ironically positive geopolitical trends, it is widely accepted that the fall 2023 harvest was better than normal, reversing recent trends.

FIGURE 1. North Korean Grain Production



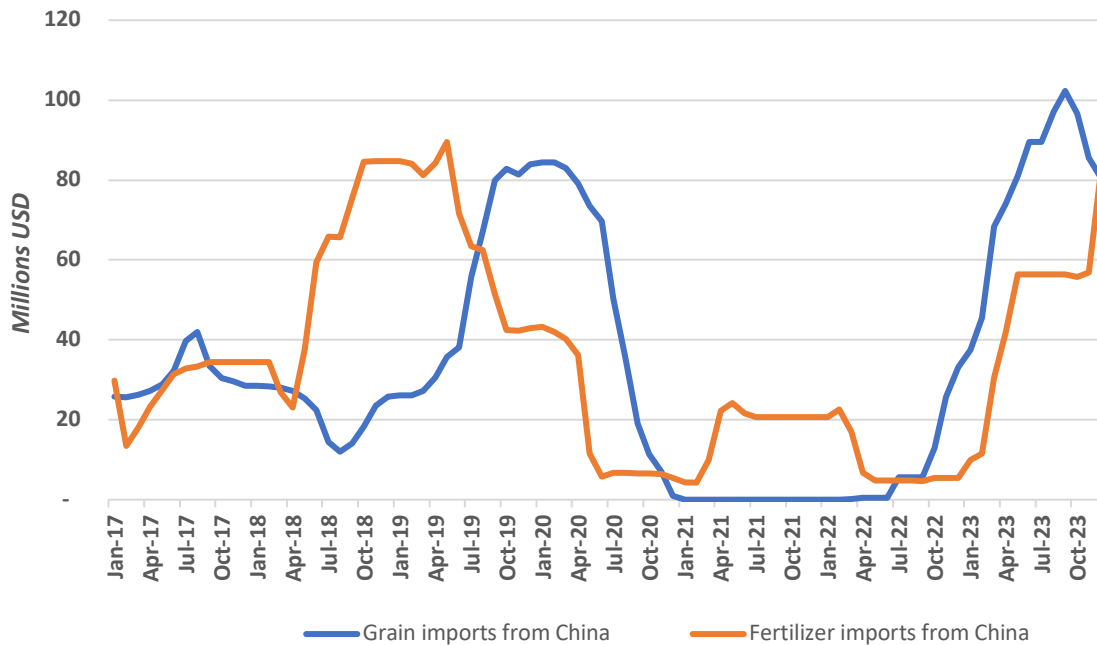
Sources: KOSIS, KRDA

Figure 1 reports data from South Korea's Rural Development Administration on North Korean grain output. After falling in the wake of the pandemic border closure, output bounced back in 2023, attaining a level not seen since 2016 and the imposition of wide-ranging UN economic sanctions.

The impression of improvement, at least in the short run, is reinforced by Figure 2, which presents 12-month trailing figures for North Korean fertilizer and grain imports derived from Chinese customs data. Both series show a resurgence in Chinese exports to North Korea following the reopening of the border and improved relations between Beijing and Pyongyang in the context of US-China tensions.

²⁸ World Food Programme, *The State of Food Security and Nutrition in the World 2023*, <https://www.fao.org/documents/card/en?details=cc3017en>.

FIGURE 2. North Korean Imports From China—Grain and Fertilizer, 2017–2023, 12-Month Trailing Sums

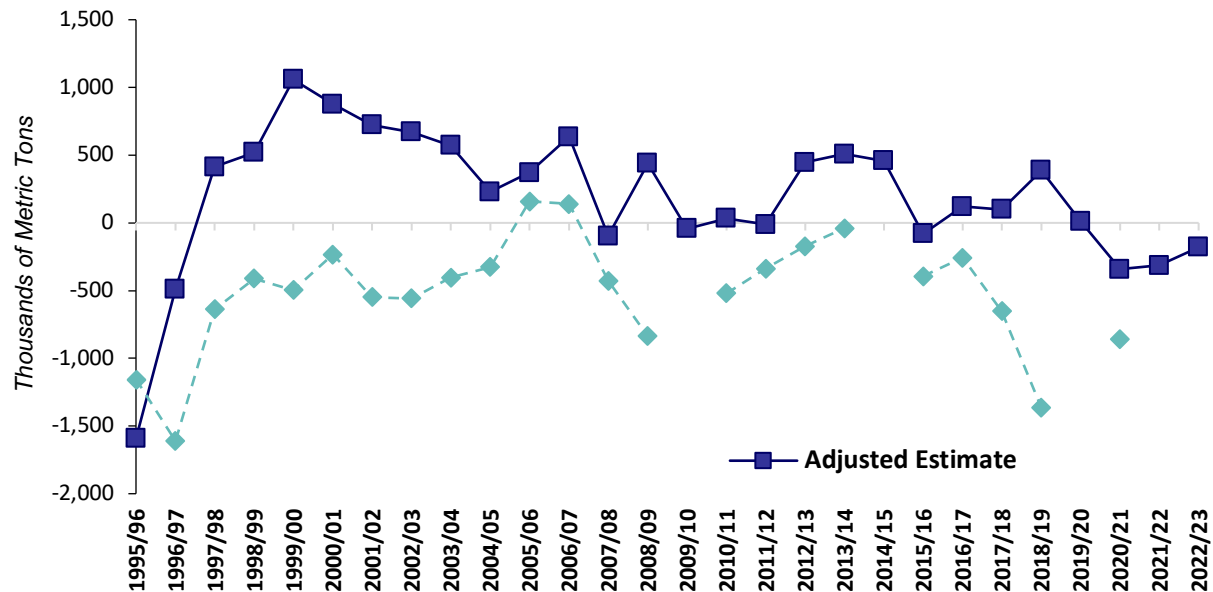


Source: China Customs

The conventional starting point for assessing food needs is a quantity balance sheet. Total need consists of requirements for human consumption (food use), seed requirements, feed use, post-harvest losses, and stock buildup. Domestic supply consists of production and any drawdown on accumulated stocks. The gap between domestic needs and supply is the uncovered food balance, which must be met through commercial imports or aid.

Executing this calculation for North Korea presents numerous challenges. There is a certain degree of uncertainty associated with each of these components in the North Korean case, with human food requirements and the size of the domestic harvest having the greatest quantitative relevance. The most commonly cited estimates are produced by the WFP and food and Agricultural Organisation (FAO). But the UN agencies can conduct their work only when they are invited in by the host country, and in the case of North Korea, this has not occurred for years. One can use alternative sources in lieu of nonexistent UN data. But even some of these data are available only with a considerable lag.²⁹ reported a quantity-balance exercise and concluded that the North Korean deficit for the 2020–21 harvest cycle was the worst since the famine period. That conclusion may well be correct, but it pertains to the situation as it existed three years ago.

²⁹ Marcus Noland, “North Korea as a Complex Humanitarian Emergency: Assessing Food Insecurity,” *Asia and the Global Economy* 2, no. 3 Noland (2022).

FIGURE 3. Two Estimates of the North Korean Grain Balance

Sources: USDA; FAO; KRDA; Author's calculations

An update of that work, along with the UN-agency net grain-balance estimates, is shown in Figure 3. The adjusted estimate makes two principal changes to the FAO/WFP methodology. First, for domestic production, it uses the average of the South Korean Rural Development Administration and US Department of Agriculture estimates of the North Korean harvests. (USDA is also the source of the import data used in this calculation.) Second, per Heather Smith's devastating 1998 critique of the FAO's human-consumption estimate for North Korea, it reduces the FAO figure by 20 percent.³⁰ In this calculation, aid is assumed to be nil.

The UN series is not credible. If these figures were true, *North Korea has avoided food shortages in only two of the last 25 years*. If North Korea really experienced the chronic shortfalls depicted by this series, it would have been in near-famine conditions almost continuously for a quarter century, an outcome contradicted by direct observation.

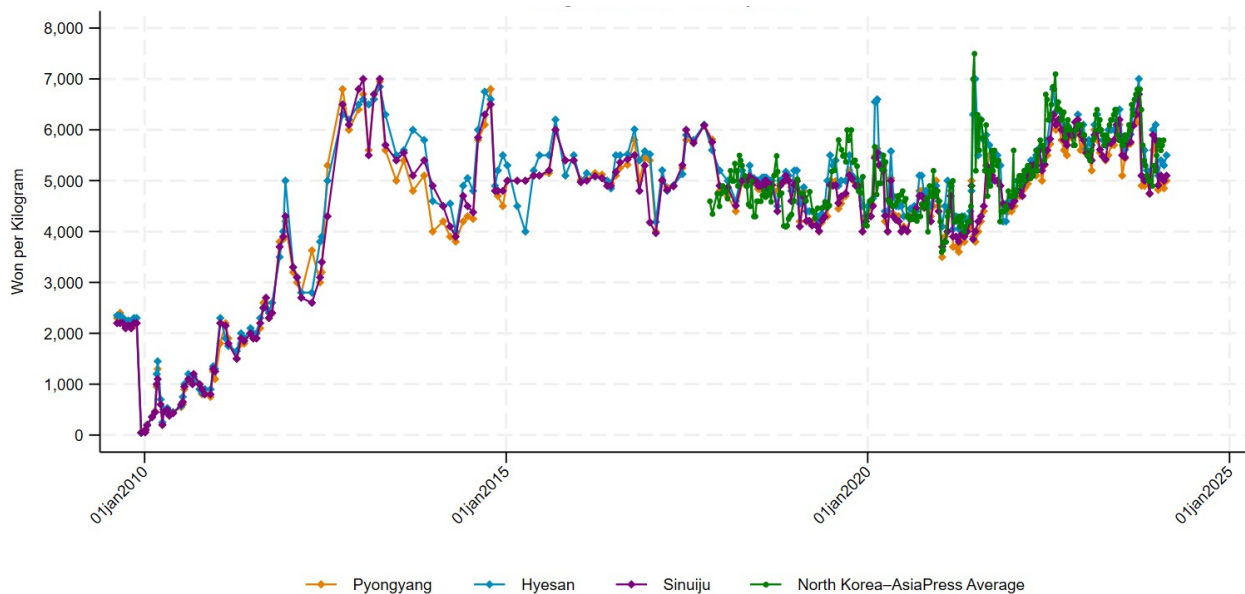
The adjusted figures tell a more plausible story. The very large food deficits during the famine period in the mid-1990s were followed by a modest agricultural recovery and small surpluses. After 2005, however, the combination of declining domestic production, higher global prices, and more erratic aid pushed available supply below even adjusted total needs. That was followed by a weak recovery, and in the 2020–21 harvest cycle, a fall back into deficit territory, though nothing on the scale of the 1990s famine. That was followed by an upturn, leaving the country with a slight deficit for the current harvest cycle, recognizing that these figures are uncertain, derisory amounts of aid are excluded from the most recent observation, and the underlying components of the calculation come with significant confidence intervals.

³⁰ Heather Smith, "The Food Economy: Catalyst for Collapse?" in *Economic Integration of the Korean Peninsula*, ed. Marcus Noland (Washington: Institute for International Economics, 1998).

Alternatively, one can examine higher-frequency data for clues. North Korean authorities impede the collection and dissemination of price data, but several NGOs have used informants to collect and report price data. Two sources, Seoul-based *Daily NK* and Osaka-based *AsiaPress*, report data consistently. These sources are widely used, including by the Korea Development Institute.³¹

Daily NK reports prices for three cities: Pyongyang, Sinuiju, and Hyesan. Prices for rice are available starting in August 2009 and for corn from November 2010 *AsiaPress* publishes a single price figure for the country collected from various locations. The sample period begins in October 2017.³² Data from the two sources are highly correlated, as are data obtained from different reporting locations. These data for rice and corn are reported in Figures 4 and 5, respectively.

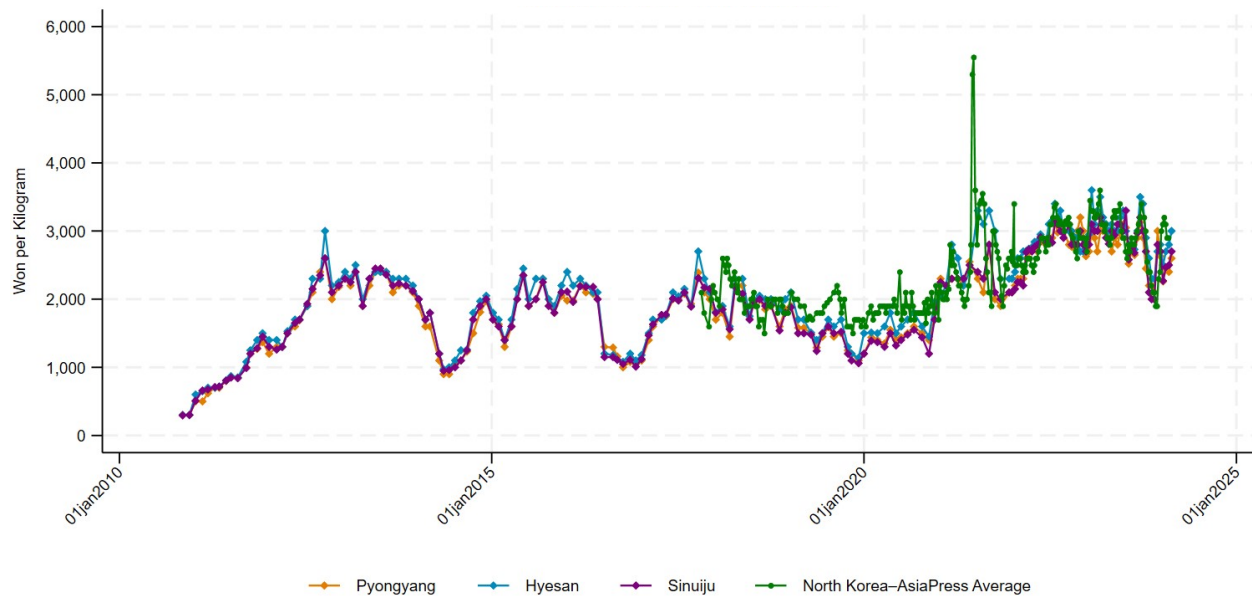
FIGURE 4. Rice Prices in North Korea (August 2009 – February 2024)



Sources: 1. *Daily NK*
2. *Asia Press*

³¹ Ji Young Choi, "The North Korean Economy Based on the Market Price and FX Rate," in *2020/2021 The DPRK Economic Outlook*, ed. Suk Lee (Korea Development Institute, July 2021); *2020/2021 The DPRK Economic Outlook*, ed. Suk Lee (Korea Development Institute, July 2021), https://www.kdi.re.kr/eng/research/dprkView?art_no=3288

³² See Noland (2022) for additional details and analysis.

FIGURE 5. Corn Prices in North Korea (November 2010 – February 2024)

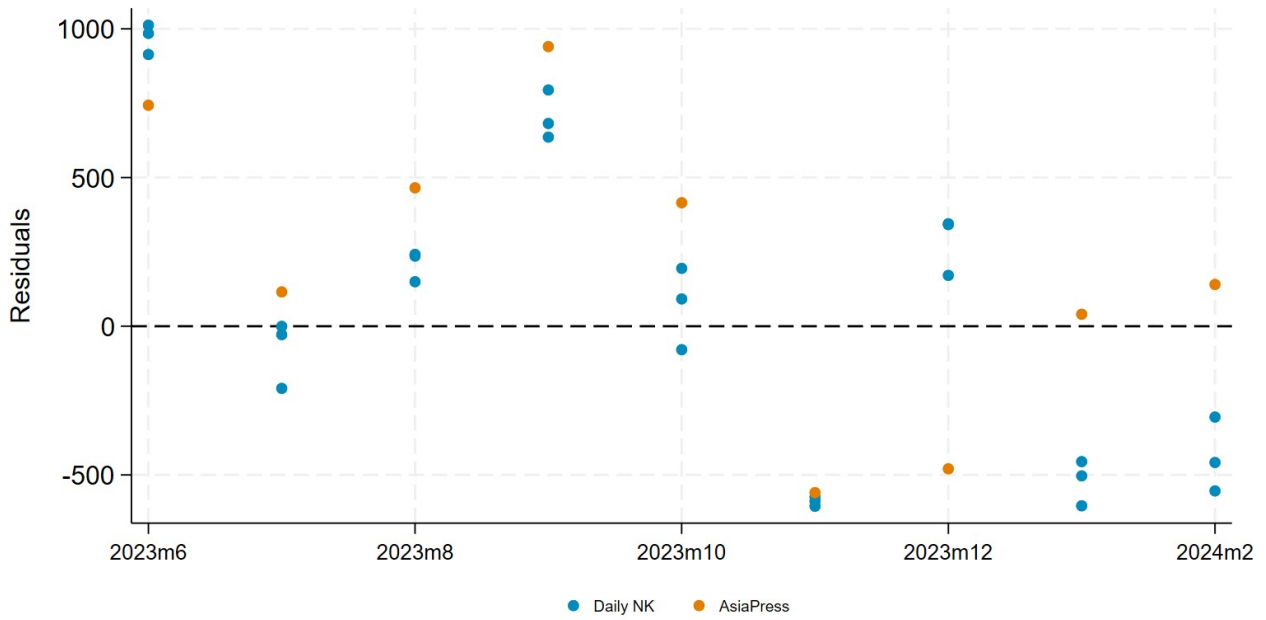
Sources: 1. Daily NK
2. Asia Press

Prices for both rice and corn appear high, but not uniquely so. Both series reached annual maximums in September as the harvest was being brought in and subsequently fell. Since November, they have been gradually rising. The issue is whether this rise warrants concern, or if it simply represents the normal increase in prices following a temporary post-harvest dip.

A simple regression of prices on monthly dummy variables, and dummies for different locations, explains more than half of the sample variance. Dummy variables added for the 2023 post-harvest period are statistically insignificant, suggesting an absence of unusual price movement since the harvest. This conclusion can be verified by visual inspection of residual plots from the simple regressions in Figures 6 (rice) and 7 (corn). The residuals are scattered around the regression line and show no tendency to take uniquely positive values (higher than expected prices) or to rise over time. More sophisticated models that allow for the possibility of divergent post-harvest behavior across the reporting locations reach the same conclusion: The recent rise in prices is consistent with the usual seasonal evolution of prices.

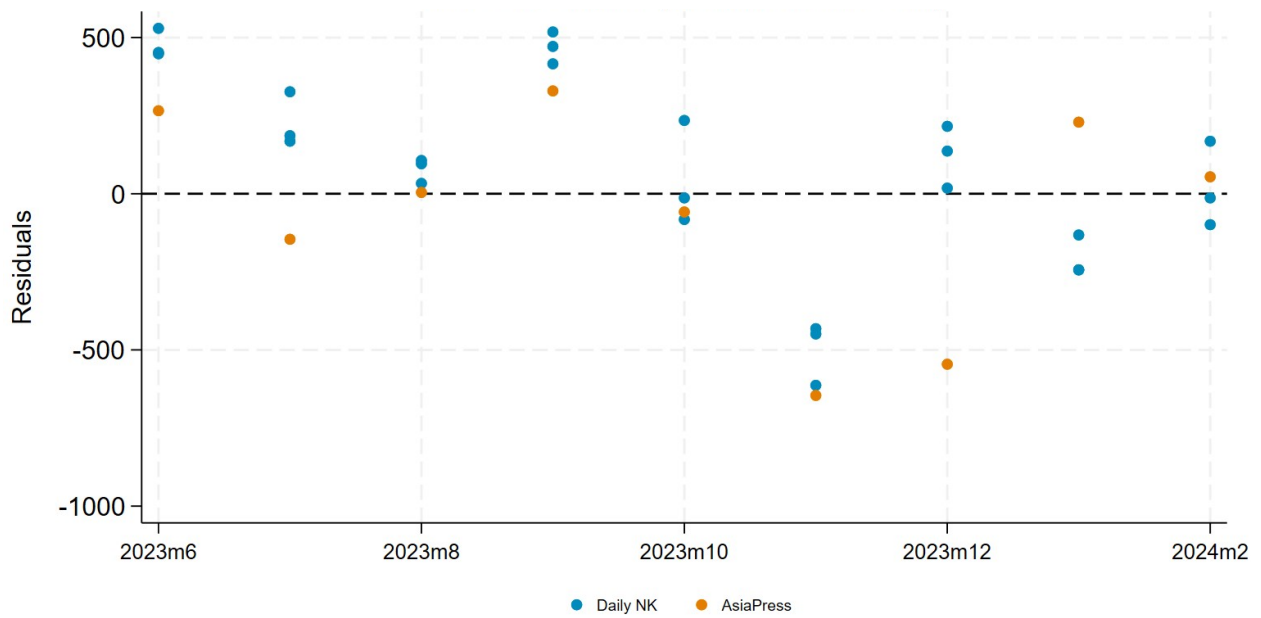
Taken together, the evidence suggests that on the back of a better than expected harvest and support from China, conditions in North Korea have stabilized. Whether North Korea can successfully operate its newly state-centric system, much less sustain that system into future years under less favorable conditions, is an open question.

FIGURE 6. Price Residuals (North Korean Rice)



Sources: 1. Daily NK
2. Asia Press

FIGURE 7. Price Residuals (North Korean Corn)



Sources: 1. Daily NK
2. Asia Press

5. CONCLUSIONS

The North Korean regime has never been comfortable with the marketization that the country experienced as a product of state failure during the famine. The market represents a loss of direct control over the population and a potential pathway to wealth and status, and potentially power, outside party or state control. North Korea has never been willing to embrace the market and is now attempting to reconstitute a state-centered food economy, something akin to, though not identical to, the prefamine status quo. Tightened security on both sides of the North Korea–China border means that cross-border population movement and decentralized exchange, which have acted as a safety valve or shock absorber in past crises, may no longer be operative. In principle, recently adopted laws and initiatives have increased state control over the production, distribution, and consumption of food. Whether this system can be rigorously implemented and sustained is an open issue.

Under current, relatively advantageous conditions, that system has avoided catastrophe. The country has benefited from Russia’s invasion of Ukraine, which has been accompanied by warming relations with and increased military exports to Russia; Sino-US political tensions have reduced China’s interest in taking a hard line toward North Korea, and in 2023, the country experienced favorable weather. Cybercrime has emerged as a significant source of revenue. However, it remains to be seen how resilient this system may prove to be if stressed by poor local harvests or reduced support from outside partners. For example, in the past, North Korea has been adversely affected by the recurring El Niño weather pattern, and recall the triggering impact of China’s reduction in grain exports to North Korea during 1993–94.³³ If conditions were to deteriorate, based on past behavior, North Korea might be expected to ease up on the enforcement of these recently adopted laws and regulations.

This concern is not a purely intellectual issue. It is of policy relevance. Were North Korea to get into trouble and once again seek large-scale assistance from the UN system, private aid groups, and the West more generally, the donor community could be facing a fundamentally state-centric system. As in the case of the 1990s famine, the regime could seek to use aid to shore up a fraying state-dominated system. From the standpoint of the donor community, the famine-era experience with a similar system was not a good one: Humanitarian-aid efforts in the 1990s were plagued by diversion of aid from intended recipients and an inability to either monitor distribution or assess effectiveness. North Korea played donors against one another, and in a race to the bottom, organizations violated their own internal protocols in their operations in North Korea.

In the wake of this episode, analysts made numerous recommendations for how relief programs could be designed to improve effectiveness and discourage abuse. Among the ideas suggested were to provide aid in forms less amenable to diversion to elite consumption—barley and millet rather than rice or corn; attempt to send it to the worst-affected areas (that is, to use the ports of Chongjin or Wonsan, on the east coast, rather than Nampo, which serves Pyongyang); to provide aid in cooked form, which is less susceptible to hoarding and diversion; and to insist on follow-up visits to distribution sites to do nutritional assessments—and to be willing to terminate aid deliveries to locations that showed no improvement among the targeted populations.

Considering North Korea’s current trajectory, it may be time to dust off those reports.

³³ Meredith Woo-Cumings, *The Political Ecology of Famine: The North Korean Catastrophe and Its Lessons*, ADB Institute Research Paper Series no. 31 (Tokyo: Asian Development Bank Institute, 2002); Marcus Noland, *Avoiding the Apocalypse*.

REFERENCES

- Choi, Ji Young. "The North Korean Economy based on the Market Price and FX Rate," in Suk Lee editor, Korea Development Institute. 2021. *2020/2021 The DPRK Economic Outlook*, July. https://www.kdi.re.kr/eng/research/dprkView?art_no=3288
- Haggard, Stephan, and Marcus Noland. 2007. *Famine in North Korea: Markets, Aid, and Reform*. Columbia University Press: New York.
- Haggard, Stephan, and Marcus Noland. 2011. *Witness to Transformation: Refugee Insights into North Korea*. Washington: Peterson Institute for International Economics.
- Human Rights Watch. 2024. "A Sense of Terror Stronger than a Bullet" *The Closing of North Korea 2018-2023* <https://www.hrw.org/report/2024/03/07/a-sense-of-terror/stronger-than-a-bullet-the-closing-of-north-korea-2018%E2%80%932023#:~:text=The%20report%20describes%20the%20numerous,lives%20of%20many%20North%20Koreans.>
- Kim Young Hoon, "Changes in the North Korean Agriculture and Agricultural Policy before and after the Pandemic," 9th Meeting of the Dialogue on the DPRK Economy. Seoul, Korea 14-15 September 2023.
- Korea Development Institute. 2021. *2020/2021 The DPRK Economic Outlook*, Suk Lee editor. July. https://kdi.re.kr/kdi_eng/pub/17150/2020_2021_The_DPRK_Economic_Outlook&pg=1&pp=10&mcd=002003
- Lee, Sang Yong. 2024. "North Korea's Agricultural Policies: Embracing the Chinese Model for Increase Productivity," *38 North*. <https://www.38north.org/2024/03/north-koreas-agricultural-policies-embracing-a-chinese-model-for-increased-productivity/>
- Lee, Suk. 2011. "Analysis on 2008 Census of North Korea and Problems," Seoul: Korea Development Institute. https://www.kdi.re.kr/eng/research/reportView?pub_no=12403 Accessed 18 April 2024.
- Lee, Wootae. 2023. "How Is The North Korean Food Situation?," https://www.kinu.or.kr/eng/module/report/view.do?idx=114336&nav_code=eng1691113830
- Noland, Marcus. 2000. *Avoiding the Apocalypse: The Future of the Two Koreas*. Washington: Institute for International Economics.
- Noland, Marcus. 2022. "North Korea as a complex humanitarian emergency: assessing food insecurity," *Asia and the Global Economy*, vol 2 no. 3.
- Sen, Amartya. 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford: Clarendon Press.
- Smith, Heather. 1998. The Food Economy: Catalyst for Collapse? In: Economic Integration of the Korean Peninsula, (ed Noland, Marcus) pp. Institute for International Economics: Washington.
- Woo-Cumings, Meredith. 2002. The Political Ecology of Famine: The North Korean Catastrophe and Its Lessons, ADBI Research Paper Series, No. 31, Asian Development Bank Institute (ADBI), Tokyo.