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Causes and consequences of the Great Vietnam Famine, 1944–5†

By GREGG HUFF*

This article analyses Vietnam's 1944–5 great famine, which, even beyond its sheer scale of a million deaths, is historically important as instrumental in the August 1945 Viet Minh and communist revolution. It is argued that typhoons which struck coastal areas resulted in a shortfall of available food and were the proximate cause of famine. The Japanese in occupation of Vietnam, the American government directing attacks on the transport system, or the country's French colonial administration could have acted to limit, or even reverse, the famine. However, under the pressure of war, no government or institution opted for an effective famine alleviation strategy. That was also true of Asia's other great Second World War famines in Bengal, Henan, and Java, which paralleled Vietnam's both in causation and in feasible avoidance strategies. In Vietnam, differences in endowments and entitlements largely explain who died in the famine.

The 1944–5 famine in Second World War Vietnam continues to resonate. Remarkable enough is the scale of famine and famine-related deaths, estimated at one million, or about 8 per cent of the population. Even more historically important, the famine's reverberations extend to one of the great events in twentieth-century world history: famine and its traumatic social and political impact enabled the Indochinese Communist Party to mobilize mass peasant support that was essential to the August 1945 revolution which brought the Viet Minh and Ho Chi Minh to power. Aided by good harvests, communist campaigns to organize labour and plant all available land helped to prevent a repeat of famine, thereby contributing to the new regime's legitimacy.

The principal aim of this article is to analyse what caused the famine and to consider how it might have been avoided. One highly influential argument, deriving from Sen, attributes famines to a shortfall of entitlements: the set of commodity bundles over which a family can gain operative control. An alternative explanation,

*Author's Affiliation: Pembroke College, University of Oxford.

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associated with the work of Ó Gráda, is that famines occur due to a lack of food.[1] Identification of a food availability deficit (FAD) famine is not so common sense as it might sound: an entitlements famine is consistent with a drop in food supplies, since even with a decline in available food, its supply may remain adequate to feed the entire population. Some groups nevertheless starve because they lack sufficient entitlements to command enough food for survival. FAD famines therefore pose an empirical question: was decline so large that available food, even if more or less equally divided, was insufficient to sustain the existing population?

This article argues that Vietnam's was a FAD famine and would not have occurred in the absence of specific weather shocks: three successive typhoons and flooding in the coastal provinces of northern Vietnam during the three months before the November 1944 rice harvest. The article draws on a further strand of famine analysis suggested by Ellman. He distinguishes between FAD_1 and FAD_2 famines. For the latter, there are 'feasible policies that could have prevented the famine (or at any rate substantially reduced the number of victims)'.[2] No such policies exist in the case of FAD_1 famines. Ellman cites the 1941–4 starvation of Leningrad and Ó Gráda adds the example of the Great European Famine of the 1310s.[3] In this article, it is contended that Vietnam's famine should be placed in the FAD_2 category and the study explores feasible policies that could have been implemented by any of three sets of authorities: the Japanese military, the French colonial administration, and the American government which could have pursued a different military policy. Although throughout the war the Japanese occupied Vietnam and had ultimate power, a pro-Vichy French colonial regime accepted Japanese occupation and was left to administer Vietnam and the rest of Indochina until a Japanese coup on 9 March 1945.

Famine is highly selective. Even if Vietnam's is most appropriately classified as an FAD_2 famine, the entitlements approach is valuable in identifying why so many people were vulnerable to any interruption in food supplies and who they were. Utilization of an entitlements approach shifts the focus from the Malthusian nature of FAD famines towards uncovering which population groups were most at risk. In Vietnam, the landless and those dependent on wage labour were by far the most likely to be among the famine dead. Although famine occurred largely in the countryside, many of its victims died in Hanoi or Haiphong, having walked to these cities in the hope of finding food.

The 'relationship between wars and famines', Sen warns, 'is a messy subject' and not amenable to easy analysis.[4] Nevertheless, war and many of the twentieth century's major famines went together. The article attempts to contribute to an understanding of this association by briefly comparing Vietnam's famine with Asia's other great Second World War famines in Bengal (now India/Bangladesh), Henan (China), and Java (Indonesia). This study suggests that in all three instances, as for Vietnam, the evidence points to FAD_2 famines. In each of the three famines, choices existed that would have saved human lives in preference to maximizing the

[1] Sen, 'Ingredients'; idem, *Poverty*; Ó Gráda, *Black '47*; idem, 'Ripple'.
[2] Ellman, 'Soviet famine', p. 621.
[3] Ó Gráda, *Famine*, p. 232.
[4] Sen, *Wars*, p. 1.

chances for victory. However, pursuit of the latter always prevailed, as it did in Vietnam.

I. Famine magnitude and geographical setting

Estimates of Vietnam's famine-induced deaths vary from a lower bound of about 700,000 to an upper one of two million. The latter, although enshrined in communist mythology and accepted by some observers, is generally regarded as too high.[5] Marr suggests a million deaths in Tonkin and the two North Annam provinces of Than Hoa and Nghe An over a five-month period (see figure 1).[6] The only number which resembles an official count is 1.3 million total deaths: a million in northern Vietnam and 300,000 in central Vietnam which would include North Annam. However, examination of archive records reveals this total to be little more than an estimate.[7] Probably a million dead over a five-month period, as indicated by Marr, is nearest the truth.[8] That would amount to 8.3 per cent of the 1943 population of Tonkin and the North Annan provinces of Than Hoa and Nghe An and 7.9 per cent of the total Tonkin and North Annam (Than Hoa, Nghe An, and Ha Tinh) populations of 12,708,700. Acceptance of the figure of 1.3 million deaths would raise mortality to 10.2 per cent of the 1943 population of all of Tonkin and North Annam, while for either 1.0 million or 1.3 million a tighter definition of Vietnam's famine affected area which restricted it to the Tonkin Delta and North Annam (Than Hoa and Nghe An) would substantially increase mortality percentages to 10.0% for a million deaths and 13.0% for 1.3 million.

Once catastrophic food shortfalls occurred, swift and decisive action would have been essential to prevent a rapid descent into famine. The unusual geography of Vietnam and its north–south contrasts are critical to understanding this point. Vietnam stretches long and thin along the coast of the South China Sea; its principal cities of Hanoi, at the head of the Tonkin Delta in the north, and Saigon-Cholon, in the Mekong Delta in Vietnam's south, are 1,745 kilometres apart. Two major rivers, the Red River and Thai Binh, flow through the Tonkin Delta. If these rivers were contained only in their natural levees, most of the delta would be flooded. During the nineteenth century French engineering constructed an extensive system of dykes which allowed Tonkin's rice production to expand and its delta to become one of the world's most densely populated areas (figure 1). Engineering also transformed the Mekong Delta in Cochinchina (the southernmost administrative district of Vietnam) through the construction of a network of canals to link existing waterways. The two delta regions served as Vietnam's principal rice-growing areas and providers of its staple food.

The differences between the two deltas were, however, fundamental. Cochinchina had large rice surpluses and became one of the world's three chief rice-exporting regions. By contrast, in Tonkin population continuously pressed against food availability in a way that can only be described as Malthusian. As

[5] 'Declaration of independence of the Democratic Republic of Vietnam', in Chen, *Vietnam*, app. II, p. 356.
[6] Marr, *Vietnam 1945*, p. 104.
[7] Centre des Archives d'Outre-Mer, Aix-en-Provence (hereafter AOM), Fonds du gouvernement de fait (hereafter GF)/12, 'Report to the Minister of the Interior (Le Nhiep)'.
[8] Marr, *Vietnam 1945*, p. 104.

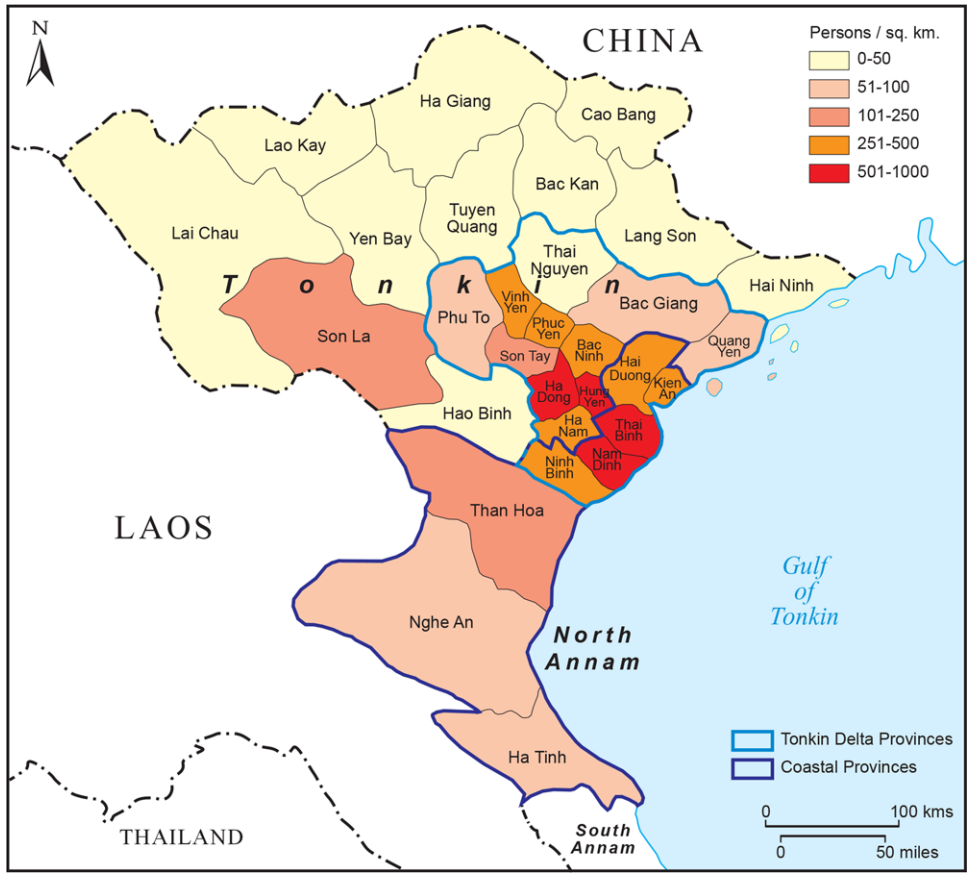

Figure 1. *Tonkin and North Annam population density, 1943*
[Colour figure can be viewed at wileyonlinelibrary.com]
Source: App. II.

early as the 1920s, Tonkin's population consumed as food some 80 per cent of the rice it produced.[9] Scarce land and abundant labour resulted in an intricacy of rice cultivation that, as a French civil servant observed, made difficult an incorporation of yet more labour. It already resembled gardening: '*Ce n'est plus l'agriculture, c'est du jardinage*'.[10]

Acute overpopulation in the Tonkin Delta and in North Annam to the south was accommodated only through a highly unequal social structure (figure 1). In the late 1930s, the delta population of some seven million included two to three million day labourers and a further million unemployed or underemployed.[11] Between 50 per cent and 60 per cent of families were virtually or wholly landless. Social inequality

[9] Office of Population Research, 'French Indo-China', p. 74.
[10] AOM, Indochine nouveau fonds (hereafter INF) 2749, 'Principes généraux de la future économie Indochinoise', pp. 9–10. Cultivation had, in the minute and individual attention given to rice plants, the character of horticulture; Gourou, *L'utilisation*, p. 240.
[11] Khérian, 'Les méfaits', pp. 478, 498–9; Brocheux and Hémery, *Indochina*, p. 265.

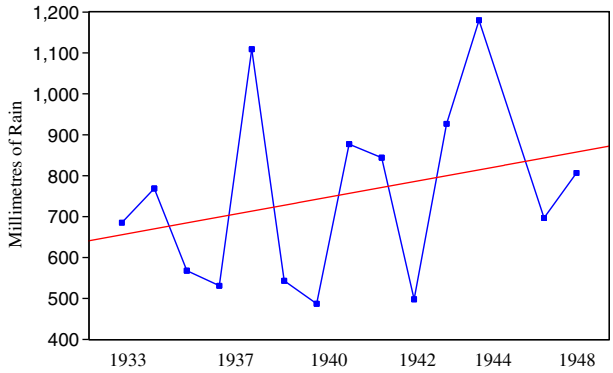

Figure 2. *Hanoi measurable rainfall, Aug. to Oct., 1933–48*
[Colour figure can be viewed at wileyonlinelibrary.com]
Source: App. II.

and unpredictable, often violent, tropical weather left most people vulnerable to shocks: 'in a normal year the poorest section of the population (50 per cent to 60 per cent) is barely sustained, but only slightly unfavourable circumstances suffice to make this population suffer from a dearth in the pre-harvest season'.[12]

The poor typically ate only one meal a day and had enough to eat for no more than four months of the year, mainly after harvests. Otherwise, they relied on somehow being able to buy or borrow rice and on greater consumption of potatoes, corn, and taros.[13] Famine was always a possibility. In 1937 in Tonkin and North Annam, it was averted only by the mobilization of rice shipments from Cochinchina in the south.[14]

II. Weather and rice output

Famine built up over a first year of poor harvests in 1943, followed, in 1944, by highly abnormal weather between August and October before Vietnam's second, and main, rice harvest in November. Coastal provinces were hit by three successive typhoons and a tidal wave. The 1944 August to October rainfall was more than 50 per cent above normal levels, and somewhat higher than in 1937, when famine had loomed (figure 2). While rainfall reflects one effect of the typhoons, it does not capture their consequences in causing rainfall intensity over a short period, high tides to which coastal areas are particularly vulnerable in the rainy season, and, above all, major ruptures in the dykes, the preservation of which was fundamental to preventing large parts of the delta from flooding. The Red River flowed six to seven metres above the surrounding land, serious breaches in dykes led to severe flooding, and in the coastal provinces 230,000 hectares of rice were destroyed, equivalent to not far short of 200,000 tons of rice at 1942 yields.[15]

[12] Gourou, *Standard*, p. 14, and see p. 6; idem, *Les paysans*, pp. 566–9, 575.
[13] Nguyen, *Le problème*, p. 18; Office of Population Research, 'French Indo-China', p. 75.
[14] Brocheux and Hémery, *Indochina*, p. 273.
[15] Catling, *Rice*, p. 350.

Table 1. *Vietnam, Tonkin, and North Annam rice output and exports, 1941–5*

	Vietnam rice output (000s of metric tons)	*Tonkin and North Annam rice output (000s of metric tons)*	*Eight coastal provinces rice output (000s of metric tons)*	*Eight coastal provinces fall in rice output as % total fall in Tonkin and North Annam*	*Total Vietnam rice exports (000s of metric tons)*
1941	6,944.0				944.5
1942	7,222.0	1,466.7	856.2		974.2
1943	7,071.0	1,422.8	818.4	86.1	1,023.5
1944	5,971.0	1,283.8	643.3	126.0	498.5
1945	4,871.0				44.8

Sources: See app. II.

The November harvest was critical, and after its failure food shortages became severe. A contemporary account from Nam Dinh province, part of the delta's coastal complex, reported that because of earlier bad weather the 'harvest was almost completely lost' and 558,383 people were left destitute: '[T]hese poor people have absolutely nothing to eat'.[16]

Two main features of the wartime falls in rice output in northern Vietnam between 1942 and 1943, and again between 1943 and 1944, are evident from table 1. One is that overall they were not large. Between 1942 and 1944 in Tonkin and North Annam, output was down 12.5 per cent from the 1942 figure of 1,467 thousand tons. It is important to note from the table that by 1945 almost no rice was being shipped to Japan. From 1944 onwards, large rice surpluses accumulated in Saigon in the south.

A second, crucial, feature of falls in rice output was their high degree of localization. Output declines concentrated in eight coastal provinces. Five were in Tonkin's delta (Hai Duong, Kien An, Nam Dinh, Ninh Binh, and Thai Binh) and the other three in North Annam (figure 1). Between 1942 and 1944, the drop in output of 24.9 per cent and 213,000 tons of rice in these eight coastal provinces was approximately in line with the roughly 200,000 tons of rice destroyed by the 1944 floods. Coastal province falls more than accounted for the overall decrease in output in all of Tonkin and North Annam; output in other, non-coastal provinces rose (table 1).

The eight provinces were not necessarily those which were most densely populated (figure 1). The strong relationship between output falls and coastal provinces points to the importance of the weather shock of typhoons, a tidal wave, and floods in triggering the great famine. If in 1944 output in the eight coastal provinces had been the same as in 1942, or probably even in 1943, it seems unlikely that the famine would have occurred, and certainly not mass famine.

The impact of the decline in rice output and its localization must be assessed in light of the precarious margins of subsistence of so many Annamite peasants. Further important considerations are the sudden and seemingly unanticipated nature of the falls; the apparent lack of rice stocks available to peasants and their practice of relying on the ability somehow to obtain rice during a large part of the

[16] AOM, GF/6, Le Tông-dôc, 'Namdinh', 20 March 1945, p. 1.

year; and the unusually cold 1944–5 winter, with temperatures dropping to around 6° centigrade. Rice stocks were low partly because in the autumn of 1943 peasants had been ordered to sell rice surpluses to the French government, while the bad winter of 1944–5 ruined a large quantity of supplementary (non-rice) crops and prevented additional planting of some supplementary crops.[17] The impact of cold weather was worsened by the scant clothing available to many individuals. Vietnam produced only a fraction of its textile requirements and Tonkin peasants depended almost entirely on buying their clothing.[18] During the war Japan sent almost no consumer goods to make up for prewar imports. By 1944, large numbers of people, as well having little to eat, had few, if any, clothes to wear.

Those lacking food in the countryside tried to eat anything: paddy husks, roots of banana trees, clover, tree bark. People walked from the countryside in 'unending lines together with their whole families' along the 'starvation roads' that led to the provincial towns and cities. Many died along the roads. Others stopped occasionally to close the eyes of the dead or to pick up a piece of rag left on bodies.[19] Enough people succeeded in walking to urban areas for reports to record that 'tens of thousands of rural folk [wandered] the streets, begging pitifully, often clad in nothing but straw matting'.[20]

III. Per capita rice availability

Data for Tonkin, although not Annam, allow the calculation of average daily per capita grams of rice available for consumption. Table 2 uses these data to show for 1942 to 1944 available rice if it had been distributed equally in each province. Rice availability calculations adopt Marr's figure of consumption of 85 per cent of rice harvested to allow for 5 per cent being held back for seed and 10 per cent lost to rodents and spoilage, and Gourou's conversion of a ton of paddy as equal to 0.6349 of a ton of milled rice (appendix II).[21] Data in the table do not allow for the French requisition of rice, which began in 1943 to build up stocks in the north because transport from Cochinchina had become difficult. Requisitions would not decrease total available rice which would depend chiefly on the harvest. However, requisitions would affect distribution and among the Vietnamese would probably disproportionately favour those in large cities through rationing. Rice was distributed, largely to urban areas, as rations; confiscated by the Japanese military; and stored against eventual need. The Japanese authorities also stored rice, although apparently mainly in Cochinchina where stocks at the end of the war were some 60,000 tons.[22]

Table 3 shows the percentage changes in rice available for consumption in Tonkin's provinces and the distribution across 14 provinces of 401,271 deaths between 1 January and 20 May 1945 reported in a government survey as

[17] Nguyên, 'La famine de 1945', pp. 89–91; Vu, 'Other side', pp. 297–8.
[18] Gourou, *Les paysans*, p. 561.
[19] Nguyên, 'La famine de 1945', pp. 83–4; Hung, *Impact*, p. 253.
[20] Marr, *Vietnam 1945*, p. 101.
[21] Gourou, *Standard*, p. 1; Marr, *Vietnam 1945*, p. 97; Office of Population Research, 'French Indo-China', p. 74.
[22] For Japanese rice stocks, see TNA, FO371/53959, Lt. Colonel T. H. Sweeny, 'Second report on Japanese financial manipulations in French Indo China', p. 3. Also cf. Marr, *Vietnam 1945*, p. 99.

Table 2. *Tonkin Delta population, population density, and rice availability, 1942–4*

	1943 population, thousands	*Area, 1,000 km²*	*1943 population density, persons per km²*	*1942 rice available, grams per capita per day*	*1943 rice available, grams per capita per day*	*1944 rice available, grams per capita per day*
Coastal provinces						
Total/weighted average	4,051.6	7.8	519.4	336.1	295.6	244.9
Hai Duong	843.5	2.3	366.7	429.4	411.9	321.3
Kien An	428.7	0.9	476.3	300.1	262.1	245.6
Nam Dinh	1,233.4	1.5	822.3	256.5	224.2	176.3
Ninh Binh	406.2	1.6	253.9	455.0	327.6	258.8
Thai Binh	1,139.8	1.5	759.9	324.3	288.0	257.5
Non-coastal delta						
Total/weighted average	4160.3	20.1	207.0	291.5	286.1	297.8
Bac Giang	311.8	5.2	60.0	460.0	507.4	495.5
Bac Ninh	543.5	1.1	494.1	285.6	322.6	274.8
Ha Dong	961.4	1.7	565.5	238.4	258.4	264.1
Ha Nam	596.2	1.2	496.8	220.7	186.0	173.8
Hung Yen	533.3	0.9	592.6	316.1	254.5	283.6
Phuc Yen	202.1	0.7	288.7	334.3	318.2	341.7
Phu Tho	351.7	3.7	95.1	141.7	105.1	174.0
Son Tay	210.6	1.0	210.6	491.4	502.0	487.9
Thai Nguyen	153.5	3.5	43.9	298.6	250.4	506.7
Vinh Yen	296.2	1.1	269.3	398.3	391.8	390.3

Sources: See app. II.

attributable to famine. Although data exclude 10 Tonkin provinces, these were all, except Quang Yen, outside the delta and accounted for just 15.6 per cent of Tonkin's 1943 population. Between 1942 and 1944 in the five Tonkin coastal provinces, rice availability, measured as grams per day, declined by between 18.2 per cent and 43.1 per cent. On a population-weighted basis, the fall averaged 27.1 per cent. Falls in available rice in Tonkin's coastal provinces—with one exception not matched in any of Tonkin's other provinces—were soon reflected in deaths as a percentage of population. During the first five months of 1945, Tonkin's five delta coastal provinces accounted for over four-fifths of deaths ascribed to famine. Death rates were between 7.2 per cent and 10.4 per cent of the population in all the provinces except Hai Duong where the rate was 4.8 per cent. A death rate in Haiphong of 9.4 per cent of the city's population is consistent with mortality data for surrounding coastal provinces, but mainly reflects famine victims who walked to the city and died there. Average death rates for coastal provinces hide even more catastrophic effects of the famine on many villages where from 20 per cent to over 50 per cent of inhabitants died.[23]

Table 4 shows percentage drops in hectares of rice planted and rice yields as the components determining total output. Between 1942 and 1944 in coastal provinces, falls in output ranged from 18.2 per cent in Kien An to 43.1 per cent in Ninh Binh. Large output falls in coastal provinces compared to a rise elsewhere in the delta are principally explained by sharp drops in yields rather than in the area

[23] *Than Nghi* [*Clear Opinion*] (a Hanoi weekly publication), no. 110, 26 May 1945, p. 105; Patti, *Why Viet Nam?*, p. 86; Khánh, 'Vietnamese August revolution', p. 769.

Table 3. *Tonkin change in rice availability, 1942–4, and famine deaths, 1 Jan.–20 May 1945*

	% fall in rice available in 1944 compared to 1942	*401,271 famine deaths as % of province population*
Coastal provinces		
Hai Duong	25.2	4.8
Kien An	18.2	7.8
Nam Dinh	31.3	10.4
Ninh Binh	43.1	10.1
Thai Binh	20.6	7.2
Non-coastal delta		
Bac Giang	−7.7	
Bac Ninh	3.8	0.9
Ha Dong	−10.8	1.3
Ha Nam	21.2	2.7
Hung Yen	10.3	1.9
Phuc Yen	−2.2	1.1
Phu Tho	−22.8	1.5
Son Tay	0.7	2.7
Thai Nguyen	−69.7	1.8
Vinh Yen	2.0	1.2

Source: See app. II.

Table 4. *Tonkin and Annam rice yields, area, and output, 1942–4 (weighted averages)*

	1942 yields, tons per hectare	*1943 yields, tons per hectare*	*1944 yields, tons per hectare*	*% fall in 1944 hectares compared to 1942*	*% fall in 1944 yields compared to 1942*	*% fall in 1944 output compared to 1942*
Tonkin						
Coastal provinces	0.87	0.81	0.67	5.9	22.5	27.1
Non-coastal delta	0.78	0.82	0.83	3.0	−5.3	−2.2
Annam						
Coastal provinces	0.69	0.67	0.48	−14.6	30.2	20.0
Non-coastal province	0.64	0.75	0.61	−25.8	4.4	−20.3

Sources: See app. II.

planted in rice. Yields probably fell mainly because flooding ruined rice which had been planted. In Tonkin between 1942 and 1944, yields, averaged over the five coastal provinces, dropped by 22.5 per cent, while the decrease in rice hectarage was just 5.9 per cent. Throughout North Annam, rice output dropped sharply because a marked increase in hectares under rice cultivation was insufficient to offset large declines in yields.

An important question, to which we also return below, is why, since rice output increased in Tonkin and North Annam outside the eight coastal provinces, grain apparently did not flow from surplus to the deficit coastal areas and so help to alleviate famine there. One reason is that the French banned inter-provincial trade. Further explanations are the scant subsistence margins on which many throughout Tonkin and North Annam lived; that the rise in rice output outside the eight coastal

provinces of 30,000 tons between 1942 and 1944 was not large; and that as news of famine spread this encouraged people to keep what rice they had.

Marr suggests that if available rice in Tonkin and North Annam had been shared absolutely equally, famine would have been avoided. He stipulates the 'barely enough' amount of rice for subsistence as 297 grams per day (about 1,065 calories) between November and the June (or fifth month) 1945 harvest.[24] Table 2 indicates that by 1944 available rice per capita exceeded Marr's subsistence threshold in only one Tonkin coastal province. Even with totally equal sharing almost none of the coastal areas would have had available as much as a daily average of 297 grams of rice. To obtain subsistence quantities of rice, most coastal provinces would have had to trade (if this had been permitted) with neighbouring provinces or obtain supplies from outside Tonkin and North Annam. Even supposing that consumption for everyone of 297 grams a day had been possible, this would probably still have had to be supplemented by potatoes, maize, or taros, which by the time famine struck could not be grown because of the exceptionally cold winter. In comparison to a subsistence level of 297 grams, Gourou identified 400, and Nguyen 500, grams as the average daily rice ration for a Tonkinese, but stressed that this was insufficient for a working man.[25]

Although famine reached its peak during the winter and spring of 1944–5 preceding the June harvest, it continued to claim lives through the summer and autumn of 1945 and into 1946. During the first half of 1946, some 20,000 people died of famine, mainly in remote villages missed by communist relief cadres and volunteers. Finally, in June 1946, with the help of favourable weather, a good harvest, and communist policies to expand non-rice crop production, the spectre of mass famine was banished. In November 1946, the north had a good rice crop.[26]

IV. Death and rice availability

Data to test the relationship between rice availability and famine are limited. Nearly all Tonkinese lived in villages of only about 1,200 persons. Villages were well separated and probably for logistical reasons the French colonial administration collected no more than a few broad social indicators. These did not extend to most basic socio-economic data or even to provincial mortality statistics. The only available data for provinces are population, area, annual rice harvests, hectares cultivated with rice, and the tabulation by 14 provincial authorities of famine deaths from 1 January to 20 May 1945.

All available data are used to investigate the relationship between per capita food availability and famine mortality rates and estimate the following equation:

$$\mathrm{DH_i} = \alpha + \beta_1 42{-}44\mathrm{RA_i} + \beta_2 43\mathrm{DP_i} + \beta_3 42{-}44\mathrm{AC_i} + u_\mathrm{i} \qquad (1)$$

[24] Marr, *Vietnam 1945*, p. 97. Meng, Qian, and Yared, 'Institutional causes', p. 1576, specify a minimum of 804 calories to stay alive, but this seems low and too low for Vietnam where most people were already badly undernourished, and during a cold winter like 1944–5. The basal metabolic rate (the level at which no surplus for physical activity exists) is, as a benchmark, around 1,080 calories for women aged 18 to 30 and 1,450 for men aged 18 to 60.

[25] Gourou, *Standard*, p. 13; Nguyen, *Le problème*, pp. 7, 11.

[26] Hoàng, *Comment*; Marr, *Vietnam: state, war and revolution*, pp. 321, 327, 329, 382.

Table 5. *Regression estimates for famine and rice availability*

	Dependent variable: % of province population that died	
Constant	1.781	2.397
	(1.10)	(3.42)***
1942–4 % Δ rice availability	−0.144	−0.160
	(−2.74)**	−(4.67)***
Population density	0.001	
	(0.38)	
1942–4 % Δ area per capita cultivated with rice	−0.046	
	(−0.28)	
R^2	0.67	0.66
N	13	13

Note: t-statistics are in parentheses.
Sources: See app. II.

where DH_i is famine deaths from 1 January to 20 May 1945 as a percentage of 1943 provincial populations; $42–44RA_i$ the December 1942 to December 1944 percentage change in per capita rice availability; $43DP_i$ the 1943 population density; $42–44AC_i$ the December 1942 to December 1944 percentage change in per capita area cultivated with rice; u_i an error term; and $i = 1, \ldots n$. The regression omits Thai Nguyen because its figure of a 69 per cent increase in rice output is too large and too adrift of the 6.2 per cent increase in per capita area under rice (and also any historical rice harvests) to be sensible. While this leaves just 13 provinces, they comprised all but three provinces in the Tonkin Delta and accounted for 95 per cent of its population and 92 per cent of its 1942 rice production. It should be noted that in equation 1 the changes in both available rice and area cultivated occurred between 1942 and 1944 while the 401,271 deaths were between 1 January and 20 May 1945, a temporal ordering which strengthens the possibility of causation.

In implementing the model, a general-to-specific methodology is adopted and tested down. The regression should be treated with caution because of the small number of observations. Regression results do, however, lend further weight to the evidence cited above for a lack of food due to bad weather as the causal explanation for the 1944–5 famine (table 5). In the first regression (column 1), the 1942 to 1944 change in rice availability is negatively related to famine deaths and significant at 5 per cent. The regression explains 67 per cent of the variance, as reflected in figure 3 which plots rice availability against famine deaths. Neither density of population nor the 1942 to 1944 change in per capita area cultivated are significant and an F-test indicates that they are not jointly significant. A second regression (table 5, column 2) tests down and shows rice availability is significant at 1 per cent.

There is no reason to suppose that the regression results reflect different effects of the war on the coastal and non-coastal delta. Both areas were similar in being occupied by the Japanese and neither was subject to any fighting. Nor were there any reports of plague or mass disease to give rise to contrasting coastal and non-coastal mortality. Spatial autocorrelation could nevertheless be present because food was drawn away from low-famine provinces, so increasing famine in these areas or because people fled high-famine locations and raised death rates in receiving provinces. Appendix I tests for spatial autocorrelation and rejects this

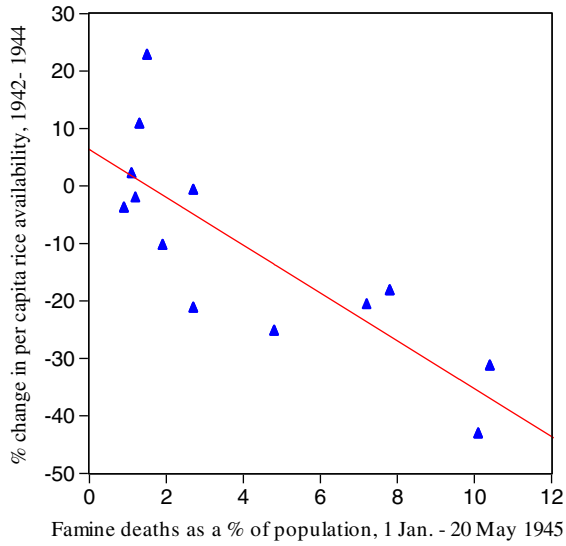

Figure 3. *Tonkin rice availability and famine deaths, 1942–5*
[Colour figure can be viewed at wileyonlinelibrary.com]
Source: App. II.

possibility. This result further strengthens the evidence that in Vietnam, a lack of rice consequent on adverse weather and war gave rise to mass famine.

V. Endowments, entitlements, and famine incidence

Even though famine arose from a decline in rice availability, its incidence was uneven and discriminate. In both Tonkin and North Annam, a large section of society—the poorest 50 to 60 per cent identified for Tonkin by Gourou—risked an entitlements failure. Endowments and exchange entitlements failures could have been anticipated from the extremely unequal distribution of land ownership in Tonkin and North Annam and because food accounted for four-fifths of the peasant budget.[27] High wartime inflation and largely inflexible money wages turned the terms of trade (the rate at which labour exchanged for rice) sharply against wage earners. Any entitlement to rations, private relief efforts, and various attempts at price control existed chiefly in cities. But even in Hanoi rice rations were inadequate and their distribution irregular.[28] The great majority of peasants, landless and living on the edge of subsistence, lacked entitlements and had labour as their only endowment on which they relied to earn enough to trade for rice.

It is, if anything, surprising that famine did not claim more than a million or even 1.3 million lives. The practice, indicated above, of borrowing or buying enough rice to survive after consumption of all harvest rice points to the disaster

[27] Gourou, *Standard*, p. 4.
[28] Vietnam National Archives Center I, Hanoi (hereafter VNA), Fonds de la Mairie de Hanoi 3499, 'Rapports journaliers du Chef des Affairs Annamites de Hanoi sur la situation sociale de la ville de Hanoi du 15 Mars au 29 Mai 1945', pp. 46, 94, 97, and 3616, Le Commissaire de Police du 2è arrondissement, 'Etat d'esprit despopulations', 29 Jan. 1944.

Table 6. *Descriptive statistics*

Variable	*Obs.*	*Mean*	*Std. dev.*	*Min.*	*Max.*
Household size (own land = 1; no land = 0)	1,646	4.746	1.946	1	15
Household size (in amount of land owned)	947	5.108	1.955	1	15
Amount of land owned (mậu)	947	2.216	5.142	0.033	50

Source: See app. II.

that must suddenly have overtaken many peasant households by early 1945. Their circumstances were acute because famine 'made increasingly rare the loans of rice between neighbours in the village, formerly given in the spirit of mutual assistance'.[29]

Data collected from 1992 to 1995 in a joint survey by the Universities of Hanoi and Tokyo allow quantification of the relationship between land endowments and famine deaths. The survey created 'memory data' of detailed statistical lists compiled by interviewing people who had lived through the famine. When possible, and often, interviews were with those in official positions at the time of the famine and so thought best placed to have specific knowledge. Although investigators considered data to have 'a high degree of accuracy', weaknesses must be acknowledged. Historical memory cannot be tested and although in north Vietnam's small, tightly knit villages good recall can be expected, a tendency to upward bias in stating famine incidence could exist. More important, the survey focused on high-mortality areas and must be interpreted in this light.[30]

An endowments hypothesis can be tested using data on land ownership and the proportion of household members who died due to famine. Data are for nine provinces with a population of 5.3 million, 42.4 per cent of the Tonkin and North Annam total. Two sets of data exist. One shows whether a household owned land or not. A second set, a subset of the first, records the amount of land owned.

In an overwhelmingly agrarian economy like northern Vietnam's, dependent on organic raw materials, land ownership is a good proxy for wealth and especially informative. Even one mậu (0.36 hectare) of land afforded a valuable safety net. Data for access to public land do not exist, but apparently even when recourse to it was possible this did little to reduce the likelihood of death. That was because public land per capita might be no more than $300m^2$ and was often low quality.

Table 6 presents descriptive statistics. The dataset recording land ownership or its absence contains observations for 1,646 households with a mean size of 4.746 and so for 7,812 individuals. Data specifying the amount of land owned are for 947 households and 4,837 individuals. Land ownership varied from a fraction of a mậu to, exceptionally, 30 mậu (10.8 hectares) or even 50 mậu.

The relationship between famine deaths and land ownership is estimated as:

$$\begin{aligned} \mathrm{DH}_i = {} & \alpha + \gamma_1 \mathrm{SZADJ}_i + \gamma_2 \mathrm{LA}_i + \gamma_3 \mathrm{SZADJLA}_i + \gamma_4 \mathrm{Ninh\ Binh}_i \\ & + \gamma_5 \mathrm{Nghe\ An}_i + \gamma_6 \mathrm{Bac\ Giang}_i + \gamma_7 \mathrm{Ha\ Dong}_i + \gamma_8 \mathrm{Hung\ Yen}_i \\ & + \gamma_9 \mathrm{Thai\ Nguyen}_i + \gamma_{10} \mathrm{Hao\ Binh}_i + \gamma_{11} \mathrm{Ha\ Tinh}_i + \varepsilon_i \end{aligned} \quad (2)$$

[29] Hung, *Impact*, p. 256.
[30] MacLean, 'History reformatted', pp. 193–8; Furuta, 'Survey', p. 228.

Table 7. *Regression estimates for household death and land*

(a)	*Dependent variable: % of household that died*		
	Coefficient	*Robust std. error*	t-*statistic*
Constant	56.716	1.794	31.61***
Household size adjusted	−1.696	0.721	−2.35**
Land ownership: 1 if own land; 0 if not	−31.017	1.705	−18.20***
Interaction household size and land ownership	1.253	0.830	1.51
Ninh Binh	11.173	4.496	2.49**
Nghe An	15.389	3.036	5.07***
Bac Giang	−24.635	2.496	−9.87***
Ha Dong	−18.021	5.437	−3.31***
Hung Yen	−5.935	3.031	−1.96**
Thai Nguyen	−12.700	3.960	−3.21***
Hao Binh	−11.869	2.831	−4.19***
Ha Tinh	−24.708	2.125	−11.63***
R^2	0.38		
N	1646		
r			

(b)	*Dependent variable: % of household that died*		
	Coefficient	*Robust std. error*	t-*statistic*
Constant	22.817	2.677	8.52***
Household size adjusted	0.829	0.469	1.77*
Amount of land owned, ln	−10.359	1.429	−7.25***
Square of amount of land owned, ln	−0.301	0.481	−0.63
Cube of amount of land owned, ln	0.470	0.200	2.34**
Ninh Binh	14.535	4.458	3.26***
Nghe An	28.906	8.921	3.24***
Bac Giang	−5.062	3.078	1.64*
Ha Dong	−11.807	4.637	−2.55**
Hung Yen	−13.890	3.979	−3.49***
Thai Nguyen	0.336	4.254	0.08
Hao Binh	−18.848	3.639	−5.18***
Ha Tinh	−27.382	3.000	−9.13***
R^2	0.26		
N	947		

Note: Thai Binh is the reference province.
Source: See app. II.

where DH_i is the percentage of household members dead from famine; SZADJ is the size of the household prior to any deaths adjusted to a zero mean; LA is land ownership entered as 1 if the household owned land and 0 otherwise, and SZADJLA is an interaction variable which multiplies household size and land ownership to take account of the impact of household size for those owning land. Each of the eight provinces is represented by a dummy variable which controls for unobserved factors; ε_i is an error term; and $i = 1, \ldots, n$. Thai Binh, coastal and mid-point in the Tonkin Delta, is the reference (omitted) province.

In the regression (table 7, panel a) household size is negatively related to death and significant at 5 per cent. Its coefficient implies for each additional household member a 1.7 percentage point lower death rate. The finding, possibly counterintuitive, may be because of an advantage for larger families, even though lacking land, of typically having more working-age members. These could, at

times of distress, contribute to the family economy through finding jobs negatively correlated with the rice harvest or by discovering some other source of income, if necessary by leaving home villages—the use of migration to pool income and resources for family social insurance.[31] By contrast, the interaction variable which incorporates household size and land ownership is positively signed although somewhat outside the 10 per cent significance level. This suggests that the benefits of income diversification through mechanisms such as migration are not so easily achieved when the family owns land. Ownership of land is highly significant with a large *t*-statistic. The coefficient indicates that possession of land was associated with a 31 per cent drop in death rates. Landowners controlled access to rice and were able to retain seed from the harvest and so after a poor 1943 harvest were in a relatively strong position in 1944. Six provinces return significance at 1 per cent and two at 5 per cent.

The regression's constant gives the predicted death rate for households of average size without land in the reference province (Thai Binh) and shows this as 57 per cent. Predicted death rates for the other provinces can be read off table 7 by adding their coefficients to Thai Binh's. The two provinces on the coast near Thai Binh, namely Ninh Binh (68 per cent) and Nghe An (72 per cent), also had high famine mortality, while inland provinces record substantially lower death rates than their coastal counterparts.

Estimation of the relationship between famine deaths and amounts of land owned uses a subset of the data for table 7, panel a. The equation is similar to equation 2 but with some new variables:

$$\begin{aligned} \mathrm{DH_i} = {} & \alpha + \gamma_1 \mathrm{SZADJLO_i} + \gamma_2 \mathrm{LOLO_i} + \gamma_3 \mathrm{LOLOSQ_i} + \gamma_4 \mathrm{LOLOCU_i} \\ & + \gamma_5 \mathrm{Ninh\ Binh_i} + \gamma_6 \mathrm{Nghe\ An}_i + \gamma_7 \mathrm{Bac\ Giang_i} + \gamma_8 \mathrm{Ha\ Dong_i} \\ & + \gamma_9 \mathrm{Hung\ Yen_i} + \gamma_{10} \mathrm{Thai\ Nguyen_i} + \gamma_{11} \mathrm{Hao\ Binh_i} + \gamma_{12} \mathrm{Ha\ Tinh_i} + \varepsilon_i \end{aligned} \tag{3}$$

One addition is SZADJLO, household size adjusted to zero mean for the subset with amounts of land owned. To allow for a nonlinear relationship between land ownership and the death rate, other additions are LOLO, the log of amounts of land owned, and LOLOSQ and LOLOCU, the square and cube of LOLO.

Regression results appear as panel b in table 7. Household size is now significant at 10 per cent and, positively signed, suggests among landowners a 0.8 percentage point increase in deaths for each additional family member. The result is consistent with the positive coefficient found on the interaction variable SZADJLA in panel a of table 7, which also suggested that larger family size increased the death rate when associated with land ownership. Land ownership, LOLO, is highly significant with a t-statistic of over 7. Its coefficient is an elasticity: a 1 per cent increase in the amount of land owned caused a 10.4 per cent decrease in death rates. The collective significance of the terms for land ownership confirms that the relationship between this and the death rate is nonlinear. The order of the nonlinear terms was increased until they ceased to be significant. Figure 4 graphs equation 3: even small amounts of land dramatically reduced household death rates, but this effect tailed

[31] Stark, 'Rural-to-urban migration', pp. 480–1.

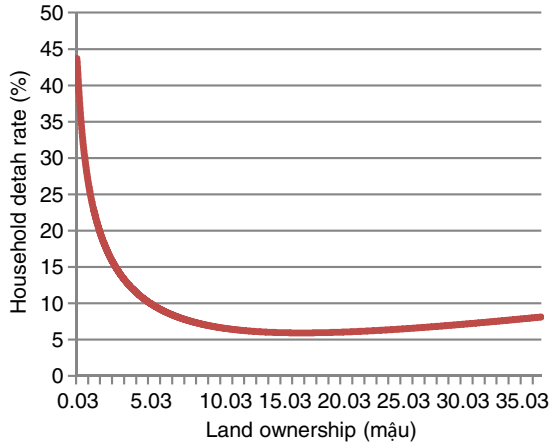

Figure 4. *Land ownership and household death rate*
[Colour figure can be viewed at wileyonlinelibrary.com]
Note: The figure plots for equation 3 the relationship between land ownership and death rates given other variables held at their data averages.
Source: Equation 3.

off rapidly. The slight increase in household death rates for households with quite large land holdings relates to only a few observations but would be consistent with these households having extended families disproportionately weighted towards the young and elderly who are likely to be more susceptible to death. Seven province dummies are significant at 1 per cent or very close to it, although one is insignificant.

Average predicted province death rates in table 7, panel a, are plotted against the 1942–4 fall in rice availability for provinces with both sets of information (figure 5). Five observations can be only suggestive. The figure does, however, lend support to the argument that famine can be traced to an absolute shortfall in food.

VI. Rural and urban famine incidence

Tonkin and North Annam were overwhelmingly rural. At least 90 per cent, and probably nearer 95 per cent, of the population lived in groupings which could not be considered even remotely urban.[32] In 1936, the region's two main cities were Hanoi (149,000) and Haiphong (70,000). While little information is available for Haiphong, its residents, like Hanoi's, apparently did not suffer the same deprivations as their peasant counterparts. In Hanoi, the better-off were seen to have more than sufficient food and even to consume it ostentatiously.[33]

Both cities were, however, greatly affected by the famine as an externality. Hunger in the countryside gave rise to continuous streams of famine victims trying to reach cities. These people clogged the roads to Hanoi. Barricades at entrances to Hanoi and other cities erected by the French colonial administration were abandoned

[32] Office of Population Research, 'French Indo-China', p. 72.
[33] Ngô, *Before the revolution*, pp. 233–8; Gunn, *Rice wars*, p. 240.

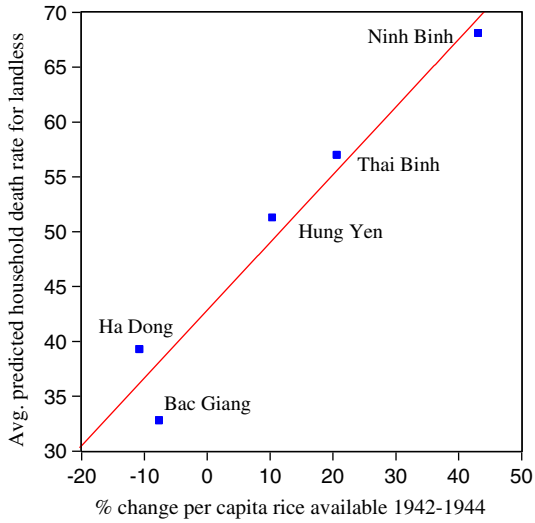

Figure 5. *Rice availability and predicted household death rates [Colour figure can be viewed at wileyonlinelibrary.com]*
Source: App. II.

after the 9 March 1945 Japanese coup and installation, under Japan's control, of a Vietnamese nationalist government.[34] Refugees poured into Hanoi, described as 'more corpses, yet more corpses' dragging themselves towards the city.[35] A number of parents tried to sell or give away their children but if neither was possible simply abandoned them in the cities. Many rural migrants died soon after arrival. The famine dead became an accustomed Hanoi sight; '50 to 70 corpses crouching along the pavement' were picked up daily.[36] Oxcarts made regular runs at 12 noon and 5 p.m. to pick up the dead and dying piling up on pavements and street corners. At dawn, if a Hanoi resident, 'you'd gingerly push your door ajar to check if there was someone dead outside'.[37] In June 1945, when famine deaths were estimated at between 100 and 200 a day, corpses were buried by the hundred in shallow pits of about two metres square in Hanoi's Hop Thien Cemetery. The pits, covering an area of about two mậu (7,200 metres^2), emitted a stench that hung over parts of the city.[38]

VII. FAD_1 and FAD_2 famines and institutional response

In Vietnam, decreased food availability did not mean that famine was unavoidable. In 1937, famine had been prevented despite adverse weather and high rainfall

[34] Hung, *Impact*, p. 256.
[35] Bàng, 'They starved', p. 105.
[36] Nguyên, 'Japanese food policies', p. 218. For daily reports of bodies collected on the streets of Hanoi, see VNA, Fonds de la Mairie de Hanoi 3499, 'Rapports journaliers du Chef des Affairs Annamites', a file of 142 pages.
[37] Bàng, 'They starved', p. 105; Khánh, 'Vietnamese August revolution', p. 769.
[38] AOM, GF/58, Nishimura, Delégation Impériale au Tonkin to mayor of Hanoi, 26 June 1945, and reply from the mayor, 9 July 1945.

(figure 2). Because of the Second World War, however, prevention in 1944 would have required new and different institutional responses.

Ellman's distinction between FAD_1 and FAD_2 famines separates the issues of causation and avoidance.[39] In an FAD_2 famine, feasible policies to avoid famine exist, but in an FAD_1 famine they do not. Ó Gráda (correctly) places Vietnam's great famine in the FAD_2 category.[40] Categorization is not, however, straightforward due to a paucity of information. A major omission is that all Japanese records were systematically destroyed just before or soon after the end of the war. Nevertheless, this section tries to assess how far human agency on the part of the French, the Japanese, and the Americans could have mitigated, or even averted, famine. The Japanese come out 'worst', in part because they exercised the most power in Vietnam, but none of the main actors entirely escapes responsibility for allowing the famine to unfold and run its course.

French actions

There are three main possible explanations for the French failure to stave off famine during the winter of 1944–5 as they had in 1937. One is that colonial officials, even before they effectively lost all power after the March 1945 Japanese coup, had become indifferent or more concerned with their own and French army welfare than that of the Vietnamese.[41] Tonkin officials were, however, alive to measures to counter famine.[42] Furthermore, although far from sufficient and largely confined to cities, a programme of rationing began, as did various attempts at famine relief, including public works.[43] There was also a plan for junks to bring rice from the south, discussed below.

Rather than deliberate French neglect, a more likely explanation is a second possibility that, in attempting to deal with a crisis of the scale of the winter of 1944–5 and with only limited resources, the French response had a negative impact. Evidence for this throws light on the question, posed above, of why so little rice moved from surplus to famine-affected regions. French attempts to manage the market significantly hindered the movement of rice and rather than preventing famine probably made it worse. In January 1942, the French administration established five special committees to regulate transactions in rice.[44] As the war went on and shortages of rice and other goods increased, 'the colonial government's prior penchant for paperwork increased relentlessly ... by early 1945, the control system was clogged by huge quantities of telegrams, letters, commodity samples, price lists, internal memos and formal complaints requiring investigation'.[45]

The plan to organize junks to transport rice failed because French officials insisted that junk owners sell 85 per cent of rice cargos at low, official prices, which

[39] Ellman, 'Soviet famine'.
[40] Ó Gráda, *Famine*, pp. 230–2.
[41] Bernardini, *Sous la botte Nippone*, pp. 51–5.
[42] VNA, Fonds de la Résidence Supérieur au Tonkin (hereafter RST) 75780, 'Étude des mesures prèventives contre des dissetes apres l'insuffisantes recoltes du riz au Tonkin'; 75782, 'Création des offices pour la lutte contre les crises alimentaires et la famine'.
[43] VNA, RST 74524 S. 67, 'Grande famine dans les provinces du Tonkin en 1945', 22 Feb.–9 March 1945.
[44] Vu, 'Political and social change', pp. 162–3.
[45] Marr, *Vietnam: state, war and revolution*, p. 318.

gave insufficient incentive to make the journey northwards and risk American air attack. A French ban on inter-provincial trade ruled out shipments that could have contributed to an equalization of supplies, for example, from South Annam, normally a rice surplus region.[46] The archives reveal detailed procedures within provinces for permissions to move even tiny quantities of rice. In May 1945, the Vietnamese government, after obtaining consent from the Japanese, allowed the free circulation and sale of grain up to 50 kilograms but by then the famine had passed its peak.[47]

A third explanation involves transport availability. After the poor November 1944 harvest, the only way fully to counter serious food shortages would have been to bring rice from the south to famine areas in the north.[48] The distances involved—between 1,600 and 1,800 kilometres from Saigon-Cholon to Tonkin's coastal famine provinces—and the bulkiness of rice as a cargo allowed just two modes of south–north transport. For both, Vietnam's long, narrow configuration meant that the only possible route was along the coast, either by coastal vessels or the Transindochinois railway. With the interdiction of Indochina's rail and sea traffic, road transport might have seemed an option. It could not, however, link Vietnam along its long, narrow geography, because distances were great, petrol scarce, and numerous bridges damaged. Vehicles for road transport were, furthermore, in increasingly short supply.

By the winter of 1944–5, the sharp deterioration in transport limited what the French could do. Furthermore, the Japanese controlled two-thirds of whatever transport remained.[49] In turning to what the Japanese might have done to avoid famine, this article also shows how restricted transport was.

Japanese actions

Even before the March coup, the Japanese controlled rice exports and had the power to direct decisions in Vietnam. In the early years of the war, large quantities of Vietnamese rice were sent back to the Home Islands, but by 1945 Allied air and submarine attacks had so decimated Japan's merchant fleet that only about 45,000 tons was exported home (table 1). It is unrealistic to expect this rice not to have been sent to Japan, which by 1945 faced acute food shortages. However, even if all rice exported to Japan had gone instead to Tonkin and North Annam this would not have prevented famine.

The Japanese required the planting of fibre and oil seed crops in Tonkin and Annam in order to fit the needs of their Greater East Asia Co-Prosperity Sphere, in which Japan would become the economic centre of a largely self-sufficient East and Southeast Asia. A shift in cultivation towards non-rice crops, shown by table 8, is often cited as an important cause of the famine. In fact, the overall effect was marginal because the acreage involved was small and some of it was in areas of Tonkin and Annam outside the coastal provinces. If, between 1942 and 1944, additional land planted in non-rice crops had instead been in rice, in 1944 it would have added 1,792 tons of rice in Annam and 18,600 tons in Tonkin. These totals are an upper bound because they assume that all the non-rice land would have

[46] AOM, Haut commissariat pour l'Indochine (hereafter 2HCI)/226, 'Mémoires personnelles sur les événements en Indochine en mars 1945 par Marc Masayuki Yokoyama', p. 90. These memoirs, written soon after the end

Table 8. *Tonkin and Annam rice, cotton, jute, ramie, and oil seed cultivation, 1942–4 (thousands of hectares)*

	1942	*1943*	*1944*
Tonkin			
Rice	1,487	1,386	1,427
Cotton	1.0	3.2	3.0
Jute	3.0	14.2	13.0
Ramie	0.4	1.0	1.2
Oil seeds	14.5	21.9	26.5
Total non-rice	18.9	40.3	43.7
Annam			
Rice	946	1,045	1,146
Cotton	4.5	7.0	9.7
Jute	0.2	0.4	0.7
Ramie	0.8	0.8	0.9
Oil seeds	27.8	26.7	25.2
Total non-rice	33.3	34.9	36.5

Notes and sources: See app. II.

instead been used for rice and that when planted in rice this land would have had the same yields as the 1944 average in Tonkin and Annam. However, insofar as land converted to oil seed and fibre crops had previously been used for root crops, the calorific and tonnage loss would have exceeded that of rice.

During the winter of 1944–5 existing transport could no longer draw on a prewar stock, but only on equipment much diminished by war and a lack of spare parts. Moreover, US air attacks made even useable transport difficult and dangerous to operate. As early as December 1943, neither the port of Haiphong nor coastal shipping northwards from Saigon were safe.[50] By April 1944, bombing had effected a 'brutal reduction' in north–south trade.[51] The US Air Force soon began to strike at will along Vietnam's coast. Resulting severe damage to the Saigon–Hanoi railway line forced a reliance on makeshift coastal shipping and road transport.[52] Because of interdiction by air attacks, little coastal shipping was available. Just when the worst of famine began to be felt during December 1944 and January 1945, railways were badly damaged and often unusable.[53] Japanese messages from December 1944, intercepted by American intelligence, show destruction of, or damage to, many

of the war in response to a request from the French, represent a first-hand account of events surrounding the famine. Yokoyama was perhaps the most important Japanese economic and political adviser in Indochina.

[47] AOM, GF58, Thư ngày 23 tháng năm 1945 của ngài khâm sai Bắc Kỳ gửi cho ông tỉnh trưởng Ninh Bình- mật (Northern Lieutenant Office to the Chief of Ninh Binh Province, 23 May 1945); Hung, *Impact*, p. 270.

[48] Marr, *Vietnam 1945*, p. 318.

[49] AOM, INF/1108, 'Bulletin de renseignements', 1436/EO/R, 9 March 1945, pp. 1, 5; INFc141d1267, 'Rapport sur les principaux problèmes économiques depuis l'armistice', 3 Feb. 1945, p. 14.

[50] Liddell Hart Centre for Military Archives, King's College, London (hereafter LHC), MAGIC, 'Military', 24 July 1943, pp. 1–2; 'Economic: Saigon', 20 Dec. 1943, pp. 5–6. MAGIC are wartime Japanese diplomatic messages intercepted and decoded by the Allies.

[51] VNA, Fonds de la direction des Finances 15154, 'Programme de l'utilisation de transports en Indochine 1944', p. 12.

[52] LHC, MAGIC, 'Indo-China's economic value to Japan', 5 July 1944, pp. 11–13.

[53] AOM, INFc123d1108, *passim*; INFc141d1267, 'Rapport sur les principaux problèmes économiques depuis l'armistice', 3 Feb. 1945, pp. 15–25; see also Gaudel, *L'Indochine*, p. 229.

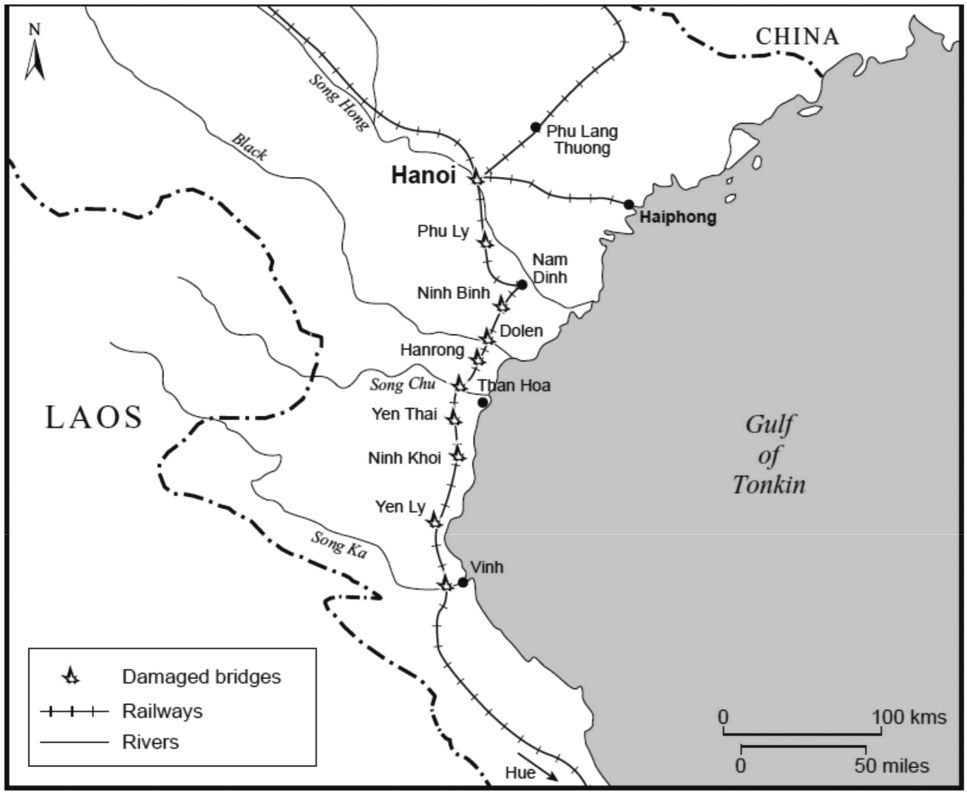

Figure 6. *Tonkin and North Annam bomb-damaged bridges, Dec. 1944*
Source: LHC, MAGIC, 12 Dec. 1944, p. 2.

of the railway bridges north of Vinh.[54] These included the strategic Than Hoa bridge which carried both rail and road traffic and linked northern Annam and the southern perimeter of the Tonkin Delta (figure 6). Although the Japanese could quickly repair bridges, US bombing maintained numerous cuts in the railway line.[55] Railway traffic encountered 'inextricable jams', while coastal shipping risked aerial bombardment and the danger of mines.[56] Between 1943 and 1944, rice shipped by rail halved to 51,410 tons and during 1945 halved again to 22,300 tons. Shipments by coastal vessels also fell sharply and in 1944 almost none of this traffic went to northern Vietnam.[57]

Japanese civilian officials hoped, nevertheless, to respond to the famine by moving northwards large amounts of rice stored in different stations south of Tourane, about halfway up Vietnam's coast. The post-March 1945 Vietnam government considered organizing transport by horse and wagon or wheelbarrow in relays from village to village, south to north. However, the plan was abandoned

[54] LHC, MAGIC, reel 11, 972, 12 Dec. 1944, p. 2.
[55] Vu, 'Other side', p. 308.
[56] AOM, INF/1108, 'Bulletin de renseignements', 1436/EO/R, 9 March 1945, p. 1.
[57] Indochina, *Annuaire statistique*, 1941–2, pp. 189–90; 1943–6, pp. 189, 191.

as impracticable because the distances involved were too great and the quantities of rice to be moved too large.[58] Another plan, apparently also abandoned, was to dig a canal from Vinh to Thanh Hoa as an alternative to the railway and colonial Route 1 road and also to avoid sea pirates.[59]

In the absence of Japanese records it is not clear how far transport might have been mobilized to prevent famine. The Japanese military chose to reserve whatever transport was still available chiefly, or possibly even entirely, for its own purposes. Consequently, and because the military had greater control over transport than the French, the Japanese bore the larger responsibility for not using existing transport to take rice to the north.

American responsibility

'The main cause of the famine' reads the official *History of the August Revolution*, 'was the application of the wartime economic policy of the French and the Japanese'.[60] Incongruously, the Americans escaped criticism and largely still do. Beginning in November 1943, the American 14th Air Force had as a main objective the destruction of Vietnam's transport system. Between April 1944 and April 1945, constant and increasing air attacks on coastal shipping and on the Transindochinois railway accomplished that objective. The American assessment is unambiguous: 'the French Indochina rail system, north from Vinh to the China border, was attacked in strength and rendered largely unserviceable'.[61] Tønnesson cites raids by Admiral Halsey's carrier fleet as especially important in an onslaught of US bombing which by early 1945 had 'almost eliminated the remaining possibilities of shipping rice and corn to the North'.[62]

The Vietnam authorities, both French and Japanese, knew the implications of American air success for the worsening famine. Monsignor Drapier, Apostolic Delegate to Indochina, appealed from Saigon for a message to be sent to the International Red Cross in Geneva to organize famine relief. The Japanese military refused to allow a message to be sent for fear of betraying the weakness of their position. Whether the Americans would have permitted neutral ships carrying famine relief, envisaged by Drapier, is far from certain, as is the possibility of organizing such vessels. On 8 March 1945, General Mordant, Commander of the French Indochina Army, cabled Paris to request that the US stop bombing north of Vinh because of famine (figure 6).[63] Whether this or any other international appeal reached Washington is not known.[64]

In May 1945 American officials, and perhaps even President Franklin Roosevelt, were certainly aware of catastrophic Vietnam famine, because Archimedes Patti, a US Office of Strategic Services officer, sent Washington a dossier of graphic photos given him by Ho Chi Minh.[65] Probably, however, the Americans knew of the famine

[58] AOM, 2HCI/226, Mémoires Yokoyama, p. 91.
[59] AOM, GF58, Thư ngày 30 tháng sáu năm 1945 của ông Lê Văn Định-bố chánh gửi ngài khâm sai Bắc Kỳ-mật (Lê Văn Định to the Chief of Northern Lieutenant Office, 30 June 1945).
[60] Vietnam, *History*, p. 88.
[61] United States Strategic Bombing Survey, *Air Campaigns*, p. 34, and see p. 23; cf. fig. 5.
[62] Tønnesson, *Vietnamese revolution*, p. 294.
[63] Ibid., p. 292.
[64] AOM, 2HCI/226, Mémoires Yokoyama, pp. 91–2.
[65] Patti, *Why Viet Nam?*, pp. 85–6, 347.

before May, since during the latter stages of the war American diplomats in China were continuously in touch with the Viet Minh, a chief American intelligence source.[66]

When the US had knowledge of the famine, American policies do not appear to have altered. They remained focused on the war in China and the maintenance of cuts in the Transindochinois railway. As well as preventing supplies from the south reaching Japanese troops in the north, the Americans aimed to turn the civilian population against the Japanese. Food, although for the US probably not specifically a weapon of war, was clearly a victim of it. 'Charity', Japan's chief economic and political adviser in Vietnam observed soon after the surrender, 'does not enter into the calculations of waging war'.[67]

Even if Japanese and American approaches to the famine had been different and large quantities of rice had been transported northwards, its effective distribution for famine relief might have been difficult. Also unknowable is the extent to which the French and Japanese would have been able or willing to organize effective famine relief, even supposing that transport was available. In fact, local transport suffered from shortages which would have hindered distribution, and villages were small and scattered. Moreover, large parts of the countryside faced increasing chaos. Apparently, by March when the Japanese took control, many of the stores of rice collected by the French had been pillaged by bands of starving people, burned at the time of the Japanese coup, or monopolized by some Japanese troops.[68]

VIII. Second World War Asian famines

Asia had the greatest of the Second World War's many famines. As well as about one million deaths in Vietnam, famines in Bengal in 1942–3 and during the same two years in Henan cost around two and three million lives respectively. The 1944–5 Java famine claimed 2.4 million people, bringing the Second World War Asian death toll for the four famines to 8.4 million. This section discusses the famines in Bengal, Henan and Java and suggests that, like Vietnam's, these were FAD_2 famines.

Of the three famines, Bengal's is the only one controversial in regard to a fall in food availability below a level needed to prevent death from outright starvation or disease. Otherwise, agreement exists in regard to all four of Asia's Second World War famines: that the bulk of the populations in each of the four areas was rural and existed at not much above subsistence levels; that each area was historically dependent on importing food from elsewhere to counter periodic threats of famine; that the Second World War made the famines worse; and that, despite the militating circumstance of war, famine need not have been so bad, and might not even have occurred, if human actions had been different.

Analysis of the absence of a significant decline in food availability during Bengal's famine, and so interpretation of it as an entitlements shortfall, rests heavily on the 1945 Famine Inquiry Commission's *Report on Bengal*.[69] However, careful and

[66] Spector, 'Allied intelligence', pp. 38–41.
[67] AOM, 2HCI/226, Mémoires Yokoyama, pp. 91–2.
[68] Ibid., pp. 87–9.
[69] Sen, *Poverty*, p. 76.

convincing examination of available quantitative and qualitative data by Bowbrick, Ó Gráda, and others indicates a sharp drop in food supply and the need to bring supplies from elsewhere to prevent famine.[70] It seems unlikely that an adequate level of food could have been maintained in view of the 32 per cent reduction in the *aman* rice crop (the larger of the two annual harvests) in 1942–3 compared to 1941–2. Furthermore, Bengal could no longer turn to the granary of Burma due to its occupation by Japan.

The probable explanation for the Famine Inquiry's findings of little change in food supplies is that this would absolve the UK and colonial Indian governments of much of the blame for two million deaths. Virtually all who have written on the famine concur that it might largely have been averted by different government actions, although the nature of these depends on conclusions about the amount of food deficiency. Moderate food decline directs blame towards speculators, hoarders, and weak public action. A lack of adequate food to sustain all Bengalis points towards the government's requisition of local ships to prevent their possible use by the Japanese and the unwillingness of the British or Indian governments to take food to Bengal despite famine conditions. The *Economist* seems neatly to have summarized official thinking: 'food ships must come second to victory ships', a stance under the pressure of war not unlike that of the Japanese military in Vietnam.[71]

The Henan famine, like Vietnam's, was the culmination of an extended build-up of unfavourable events arising from a combination of weather and war. In June 1938, Nationalist Chinese forces blasted the dykes on the Yellow River to block Japanese military advance. Resulting floods displaced millions of people and made 'farming virtually impossible'.[72] Between 1936 and 1938, grain output halved. In 1938 and 1939, attempted Nationalist reconstruction of dykes along the western bank of the Yellow River's new course was unsuccessful and repeated flooding occurred. That was followed in 1940–2 by severe drought due to just 40 per cent to 60 per cent of average rainfall, and recurrent plagues of locusts for which flood-ruined farmland offered an ideal breeding ground. In 1941–2, grain output dropped to 22 per cent of that in 1936.[73] Although Henan farmers grew other crops in addition to a variety of grains, notably sweet potatoes and peanuts, 1942 yields per unit of sown area fell 40 per cent below the prewar average, 'an extreme case of crop failure'.[74] At the same time, the Chinese and Japanese armies, both reliant on living off the land, made large demands for grain from the local population through taxes, forced deliveries, and raids.

Two feasible famine-coping mechanisms were available. One was migration in search of food. Beginning in 1937, about three million people left their traditional areas. Flight was no more than a palliative, however. The other, necessary strategy was to bring food from elsewhere. However, the Nationalist government was reluctant in wartime to release grain for warehouses in neighbouring provinces or, faced with the need to finance war, to reduce grain taxes. Grain-surplus provinces

[70] Bowbrick, 'Causes', pp. 109–15; Ó Gráda, 'Ripple', pp. 20–32.
[71] 'Food for India', *Economist*, 30 Jan. 1943, p. 141.
[72] Muscolino, 'Violence', p. 299.
[73] Muscolino, *Ecology*, pp. 90–5; idem, 'Violence' p. 300.
[74] Garnaut, 'Quantitative description', p. 2023.

closed their borders to food shipments to Henan. Furthermore, demands from the Nationalist and Japanese armies left transport in short supply.[75] Government and armies prioritized transport for war rather than food, as in Bengal and Vietnam.

In 1941 in Java, rice supplies between surplus and deficit areas were adjusted through the transport of 900,000 tons by rail, 300,000 tons by truck, and 150,000 tons by water, in all 29.3 per cent of Java's rice harvest.[76] War, Japanese occupiers, and drought in 1944 destroyed the island's fragile food equilibrium to create mass famine. Between 1941 and 1944, low administered prices and poor weather caused a 22 per cent fall in the harvested area of Java's seven main food crops, from 8.2 million to 6.4 million hectares. Of the seven crops, the area of sweet potatoes alone increased but in 1944 still accounted for just 0.3 million hectares of cropland, far too small an addition to food calories to compensate for other drops.[77]

The decline in food output would probably by itself have brought famine, but it was assured by the Japanese military's balkanization of Java. The military enforced autarky in each of Java's 18 provinces to try to achieve provincial self-sufficiency in order to ensure supplies for the army in any Javanese province even after Allied capture of other provinces.[78] In Java's 18 provinces, average per capita calorie availability fell from 2,099 calories in 1941 to 1,316 calories by 1944. Even more tellingly, in 1944 calorie availability was under 900 in two provinces, less than 1,200 in three further provinces, and below 1,300 in another four provinces.[79] Large numbers of victims from a famine-stricken countryside migrated to large cities, notably Jakarta, and often died there, much as happened in Calcutta, Hanoi, and Haiphong.

Evidence for the three famines, although possibly ambiguous for Bengal, points to FAD_2 famines, as in Vietnam. During the Second World War in what were normally food-deficit areas, dramatic drops in food availability resulted from unfavourable weather and/or unrealistic administered prices. Although different decisions and policies could have averted major famine, they were not implemented. In each instance, war particularly encouraged famine and made governments insensitive to its consequences. Rural famine is, Duiker observes, 'a factor so familiar to students of the revolutionary process'.[80] Late in the Second World War, the Henan famine helped the Chinese Communist Party to become a mass movement and thus important in China's peasant-based revolution.[81] So too, in Vietnam, famine enabled the Viet Minh to organize peasant support for revolution.

IX. Conclusion: famine and revolution

This article has shown that the 1944–5 Vietnam famine was triggered by a catastrophic fall in food availability due to typhoons, abnormally high rainfall, and

[75] Muscolino, *Ecology*, pp. 108–11; Garnaut, 'Quantitative description', pp. 2007–12, 2043–5.
[76] [Anon.], 'De rijstpositie van Nederlandsch-Indie', pp. 81–2; Department of Economic Affairs, Batavia, 'Rice production', p. 10.
[77] van der Eng, 'Regulation and control', p. 195.
[78] de Jong, *Collapse*, p. 22; van der Eng, 'Regulation and control', pp. 197, 203.
[79] van der Eng, 'Food supply', p. 79.
[80] Duiker, *Communist road*, p. 104.
[81] Garnaut, 'Quantitative description', p. 2008.

flooding. Fact does not, however, necessarily assume primacy in shaping historical narrative. Weather is far too neutral an occurrence for a revolutionary movement like the Viet Minh to cite as the cause for what remains the greatest disaster in modern Vietnamese history. It was far better to attribute responsibility, as now unshakeably enshrined in carefully state-constructed historical memory, to the French colonialists and Japanese fascists.[82]

As late as March 1945, the Indochina Communist Party, led by Ho Chi Minh and the organizing force behind the Viet Minh, was not in a strong position. Seizing the moment, the Party identified three opportunities for revolution: the Japanese coup, the climax of the Pacific War, and the famine. The first helped to overturn a traditional rural hierarchy and the second to end Japanese rule but not immediately put anything in its place. Of the three, the famine was fundamental and a necessary, though not sufficient, condition for revolution. Goscha summarizes: 'famine, more than anything else, ushered in change'.[83] Famine was utilized to instil in the masses an 'I.C.P. [Indochinese Communist Party]-oriented "political consciousness"'.[84] It afforded the mobilizing means for what was 'at bottom, a peasant revolution'.[85]

The spectacle of months of mass death, which onlookers had been powerless to halt, created an acceptance of the need for basic change extending far into society and among people who were not Viet Minh adherents. By the end of the war, the Viet Minh enjoyed wide support. Although entirely unsubstantiated, Ho Chi Minh's 1945 stated figure of two million famine dead was 'indispensable to anti-colonial discourse'.[86]

The Viet Minh rode to power on the two slogans of 'national independence' and, referring to rice stored by the French and Japanese, 'destroy the paddy granaries and solve the famine'.[87] After famine struck, 'the Viet Minh came out of hiding and mobilized the population to seize rice that both the French and Japanese had stored in case of food shortages'.[88] Crucially, the campaign against famine enabled the Viet Minh to head 'a genuine mass movement'.[89] A report typical of many from civil servants captures the mood of widespread revolt: 'Around eight o'clock on 23 May 1945 the theft of paddy was carried out by ... a group of people carrying rifles, spears, batons and a red flag inscribed with the words "Viet Minh". An enquiry is underway'.[90]

In textbook Leninist fashion, with at most 900 men the Viet Minh insurrection took control of Hanoi on the night of 19 August 1945. Tens of thousands of peasants immediately supported the Viet Minh and, activated by famine and revolution, marched on Hanoi, Haiphong, and Hue, solidifying the initial stage of revolution. Ho Chi Minh publicly proclaimed independence on 2 September 1945. The new regime gained legitimacy in 1946 and 1947 through superior communist

[82] Vietnam, *History*, pp. 88–96.
[83] Goscha, *Penguin history*, p. 211.
[84] Khánh, 'Vietnamese August revolution', p. 776.
[85] Woodside, *Community*, p. 230.
[86] Brocheux, *Histoire économique*, p. 163; see also Brocheux and Hémery, *Indochina*, p. 348.
[87] Woodside, *Community*, p. 233.
[88] Brocheux, *Ho Chi Minh*, p. 90.
[89] Nguyên, 'Japanese food policies', p. 221; idem, 'La campagne nord-vietnamienne', p. 135.
[90] AOM, GF/62, Nguyen Trong Tan, Trân-Phu de Vinh Yên to Kam Sai, Hanoi, 25 May 1945; see also, for example, GF/66 for a series of reports and letters from Bac Ninh province on growing disorder, numerous bandit raids and pillage.

organization in dealing with famine and helping to avoid a repetition of it, combined with the luck of good harvests. The great famine of 1944–5 profoundly influenced the course of Vietnam's history, and, two decades later, that of the US as well.

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Footnote references

[Anon.], 'De rijstpositie van Nederlandsch-Indie', *Economisch Weekblad voor Nederlandsch-Indië*, 12, 11 (1946), pp. 81–2.
Banens, M., 'Vietnam: a reconstruction of its twentieth century population history', in J.-P. Bassino, J.-D. Giacometti, and K. Odaka, eds., *Quantitative economic history of Vietnam 1900–1990: an international workshop* (Tokyo, 2000), pp. 1–40.
Bàng Bá Lân, 'They starved, they starved', trans. Huynh Sanh Thong, *Vietnam Forum*, 5 (1985), pp. 101–7.
Bernardini, J.-J., *Sous la botte Nippone* (Paris, 1971).
Bowbrick, P., 'The causes of famine: a refutation of Professor Sen's theory', *Food Policy*, 11 (1986), pp. 105–24.
Brocheux, P., *Ho Chi Minh: a biography*, trans. C. Duiker (Cambridge, 2007).
Brocheux, P., *Une histoire économique du Viet Nam 1850–2007: la palanche et le camion* (Paris, 2009).
Brocheux, P. and Hémery, D., *Indochina: an ambiguous colonization 1858–1954*, trans. L. L. Dill-Klein, E. Jennings, N. Taylor, and N. Tousignant (Berkeley, Calif., 2009).
Catling, D., *Rice in deep water* (1992).
Chen, K. C., *Vietnam and China 1938–54* (Princeton, N.J., 1969).
Department of Economic Affairs, Batavia, 'The rice production in Indonesia', *Economic Review of Indonesia*, 1, 1 (1947), pp. 9–12.
Duiker, W. J., *The communist road to power in Vietnam* (2nd edn., Boulder, Co., 1996).
Ellman, M., 'The 1947 Soviet famine and the entitlement approach to famines', *Cambridge Journal of Economics*, 24 (2000), pp. 603–30.
van der Eng, P., 'Food supply in Java during war and decolonization, 1940–1950', Univ. of Hull Centre for Southeast Asian Studies occasional paper no. 25 (1994).
van der Eng, P., 'Regulation and control: explaining the decline of food production in Java, 1940–6', in P. H. Kratoska, ed. *Food supplies and the Japanese Occupation in South-East Asia* (Basingstoke, 1998), pp. 187–207.
Furuta Motoo, 'A survey of village conditions during the 1945 famine in Vietnam', in P. H. Kratoska, ed., *Food supplies and the Japanese occupation of South-East Asia* (Basingstoke, 1998), pp. 227–37.
Garnaut, A., 'A quantitative description of the Henan famine of 1942', *Modern Asian Studies*, 47 (2013), pp. 2007–45.
Gaudel, A., *L'Indochine française en face du Japon* (Paris, 1947).
Goscha, C. E., *The Penguin history of modern Vietnam* (2016).
Gourou, P., *Les paysans du delta tonkinois, étude de géographie humaine* (Paris, 1936).
Gourou, P., *L'utilisation du sol en Indochine française* (Paris, 1940).
Gourou, P., *The standard of living in the delta of the Tonkin (French Indo-China)* (New York, 1945).
Gunn, G. C., *Rice wars in colonial Vietnam: the great famine and the Viet Minh road to power* (Lanham, Md., 2014).
Hoàng Văn Đức, *Comment la révolution a triomphé de la famine (la campagne des cultures sèches en novembre 1945–avril 1946 au Viêt-Nam)* (Hanoi, 1946).
Hung, L. M., *The impact of World War II on the economy of Vietnam 1939–45* (Singapore, 2004).
de Jong, L., *The collapse of a colonial society: the Dutch in Indonesia during the Second World War* (Leiden, 2002).
Khánh, Huỳnh Kim, 'The Vietnamese August revolution reinterpreted', *Journal of Asian Studies*, 30 (1971), pp. 761–82.
Khérian, G., 'Les méfaits de la surpopulation delaïque', *La Revue Indochinoise: Juridique & Économique*, 7–8, pt. 2 (1938), pp. 476–505.
MacLean, K., 'History reformatted: Vietnam's great famine (1944–1945) in archival form', *Southeast Asian Studies*, 5 (2016), pp. 187–218.
Marr, D. G., *Vietnam 1945: the quest for power* (Berkeley, Calif., 1995).
Marr, D. G., *Vietnam: state, war and revolution (1945–1946)* (Berkeley, Calif., 2013).
Meng, X., Qian, N., and Yared, P., 'The institutional causes of China's great famine, 1959–1961', *Review of Economic Studies*, 82 (2015), pp. 1568–611.

Muscolino, M. S., 'Violence against people and the land: the environment and refugee migration from China's Henan province, 1938–1945', *Environment and History*, 17 (2011), pp. 291–311.
Muscolino, M. S., *The ecology of war in China: Henan province, the Yellow River, and beyond, 1938–1950* (New York, 2015).
Ngô Viñh Long, *Before the revolution: the Vietnamese peasants under the French* (New York, 1991).
Nguyên Thê Anh, 'La famine de 1945 au Nord-Viêt-Nam', *Vietnam Forum*, 5 (1985), pp. 81–100.
Nguyên Thê Anh, 'La campagne nord-vietnamienne de la dépression économique de 1930 à la famine de 1945', *Vietnam Forum*, 9 (1987), pp. 120–37.
Nguyên Thê Anh, 'Japanese food policies and the 1945 great famine in Indochina', in P. H. Kratoska, ed. *Food supplies and the Japanese Occupation in South-East Asia* (Basingstoke, 1998), pp. 208–26.
Nguyen Van Huyen, *Le problème de la paysannerie Annamite au Tonkin* (Hanoi, 1939).
Ó Gráda, C., *Black '47 and beyond: the great Irish Famine in history, economy and memory* (Princeton, N.J., 1999).
Ó Gráda, C., 'The ripple that drowns? Twentieth-century famines in China and India as economic history', *Economic History Review*, 61, S1 (2008), pp. 5–37.
Ó Gráda, C., *Famine: a short history* (Princeton, N.J., 2009).
Office of Population Research, 'French Indo-China: demographic imbalance and colonial policy', *Population Index*, 11, 2 (1945), pp. 68–81.
Patti, A. L. A., *Why Viet Nam?: prelude to America's albatross* (Berkeley, Calif., 1980).
Sen, A., 'Ingredients of famine analysis: availability and entitlements', *Quarterly Journal of Economics*, 96 (1981), pp. 433–64.
Sen, A., *Poverty and famines: an essay on entitlements and deprivation* (Oxford, 1981).
Sen, A., *Wars and famines: on divisions and incentives* (1991).
Spector, R., 'Allied intelligence and Indochina, 1943–1945', *Pacific Historical Review*, 51 (1982), pp. 23–50.
Stark, O., 'Rural-to-urban migration in LDCs: a relative deprivation approach', *Economic Development and Cultural Change*, 32 (1984), pp. 475–86.
Tønnesson, S., *The Vietnamese revolution of 1945: Roosevelt, Ho Chi Minh and de Gaulle in a world at war* (1991).
Van Tao and Furuta Motoo, eds., *Nan doi Nam 1945 o Viet Nam: nhung chung tich lich su* (Hanoi, 2011).
Vu Ngu Chieu, 'Political and social change in Viet-Nam between 1940 and 1946' (unpub. Ph.D. thesis, Univ. of Wisconsin, Madison, 1984).
Vu Ngu Chieu, 'The other side of the 1945 Vietnamese revolution: the empire of Viet-Nam (March–August 1945)', *Journal of Asian Studies*, 45 (1986), pp. 293–328.
Woodside, A. B., *Community and revolution in modern Vietnam* (Boston, Mass., 1976).

Official publications

Indochina, *Annuaire statistique de l'Indochine* (irregular ser. covering the years 1913–46; Hanoi, 1927–48).
Indochina, *Atlas de l'Indochine* (Paris, 1928).
United States Strategic Bombing Survey, *Air Campaigns of the Pacific War* (Washington, DC, 1946).
Vietnam, Democratic Republic of Vietnam, *History of the August Revolution* (Hanoi, 1972).

Appendix I: Spatial autocorrelation test

To test for spatial autocorrelation, but also bearing in mind the limited number of observations, I use a parsimonious autoregressive (SAR) model given by:

$$y = X\beta + u,\ u = \lambda Wu + \varepsilon \tag{2}$$

where y is an $n \times 1$ vector of observations, X is an $n \times k$ matrix of regressors, ß is a $k \times 1$ vector of unknown parameters, u is an $n \times 1$ vector of disturbances, ε is an $n \times 1$ vector of unobservable, mutually uncorrelated, random variables with zero mean and unknown variance σ^2, λ is an unknown scalar (spatial autoregressive coefficient), and W is a given $n \times n$ 'weight' matrix, with element w_{ij} in its ith row, jth column. Taking $w_{ii} = 0$, $1 \leq i \leq n$, and for $i \neq j$, w_{ij} is a measure for the inverse distance between observations i and j. Specifically, if d_{ij} is the distance between the ith and jth locations, one can take:

$$w_{ij} = 1/d_{ij},$$

so the closer the *ith* and *jth* locations are, the greater the weight w_{ij}. Distances between centroids (mid-points) for each of Tonkin's provinces are used to compile a matrix. I use distances for 1944 provinces which are different from those now current.

The basic question is whether the elements of u are in fact uncorrelated; that is, whether the null hypothesis:

$$H_0 : \lambda = 0$$

holds, or the (two-sided) alternative:

$$H_1 : \lambda \neq 0$$

This question can be answered using a Lagrange multiplier statistic given by:

$$LM = \frac{n^2}{tr(WW + WW')}\left(\frac{y'PWPy}{y'Py}\right)^2 \qquad (*)$$

Under H_0, LM has an approximate ${\chi_1}^2$ distribution under suitable regularity conditions. H_0 would, for example, be rejected in favour of H_1 at the 5 per cent level if LM>3.841, and at the 1 per cent level if LM>6.635.

To compute the LM statistic, I denote $y = DH$ where DH is famine deaths from 1 January to 20 May 1945 as a percentage of 1943 provincial populations and $X = [42 - 44RA, 43DP, 42 - 44AC]$ is a 13×3 matrix of the regressors in equation 1. I use X to compute $P = I - X(X'X)^{-1}X'$. Finally, W is an $n \times n$ weight matrix with $w_{ij} = \frac{1}{d_{ij}}$ (or its normalized version $w_{ij} = \frac{\frac{1}{d_{ij}}}{\sum_{j=1, j\neq i}^{n}(\frac{1}{d_{ij}})}$); where $n = 13$. Each is given by the matrix of 13 Tonkin provinces, for example, if $i =$ Hai Duong and $j =$ Kien An, then $d_{ij} = 29.73$ km measures the distance between Hai Duong and Kien An, while $w_{ij} = \frac{1}{d_{ij}} = 0.0336$ is the inverse distance. This implies that the closer are the ith and jth locations the greater the weight w_{ij}.[91] Matrix W is computed by iterating i and j across all provinces.

Similarly, for the normalized version, each weight is divided by the sum of inverse distances of each province from all provinces. For example, if $i =$ Hai Duong and $j =$ Kien An, then $w_{ij} = 0.0336$ as above. The sum of inverse distances of all provinces from Hai Duong is given by $\sum_{j=1, j\neq i}^{n}(\frac{1}{d_{ij}}) = 0.1971$. Thus, the normalized version is given by $w_{ij} = \frac{0.0336}{0.1971} = 0.1705$.

To compute the LM statistic, I substitute to 4 the computed matrices, that is, W and P, the dependent variable and regressors as defined in equation 1 above, y and X data, and n = 13:

$$LM = \frac{n^2}{tr(WW + WW')}\left(\frac{y'PWPy}{y'Py}\right)^2 = \frac{13^2}{0.1054}\left(\frac{-0.44}{46.28}\right)^2 = 0.1458$$

Since 0.1458<3.841 and <6.635, H_0 cannot be rejected at the 5 per cent or at the 1 per cent level. Use of the normalized version of W, that is, $w_{ij} = \frac{\frac{1}{d_{ij}}}{\sum_{j=1, j\neq i}^{n}(\frac{1}{d_{ij}})}$, yields the same result. In particular, LM = 0.2277 and H_0 cannot be rejected at 5 per cent or at 1 per cent. Spatial autocorrelation can be ruled out.

[91] For example, if $i =$ Hai Duong and $j =$ Kien An the assigned weight is equal to 0.0336; while if $i =$ Hai Duong and $j =$ Vinh Yen the assigned weight is equal to 0.0099. Since the distance between Hai Duong and Kien An is shorter than between Hai Duong and Vinh Yen, the weight is greater in the former than in the latter.

Appendix II: Data sources

Vietnam population, area, and density: Indochina, *Annuaire statistique 1941–1942*, p. 87; 1943–6, p. 89.

As an alternative to official data, Banens ('Vietnam: a reconstruction') uses the West life tables (a model of human mortality based on several periods before 1900 and after the Second World War and mainly using data for North America, western Europe, Australia, and New Zealand), numerous assumptions, and the 1989 Vietnam census to reconstruct backwards Vietnam's population for 100 years. Estimation for Annam and Tonkin, the areas considered in this article, Banens acknowledges, is 'hard to realise in the actual state of knowledge' and must 'assume the general Vietnamese mortality and fertility patterns and an identical population structure in 1884' (p. 32). Banens's reconstruction produces a somewhat higher north Vietnam population than official figures. Given the many assumptions, uncertainties, and processes necessary to reach an estimated north Vietnamese population five decades previous to 1989, there seems no reason to prefer Banens's estimate to the official data used in this article. Similar reasoning applies to Banens's famine death estimates, which at a lower bound of estimation diverge from any other estimates, and rely on assumptions of patterns similar to the 1943–4 Bengal famine and 1965 to 1975 American Vietnam war deaths.

Rice output, cultivated area, and yields: Indochina, *Annuaire statistique 1941–1942*, pp. 87, 176, 188, 283; *1943–1946*, pp. 89–91, 188, 277.

The delta province for which no data exist is Quang Yen.

Data were not published for 1941.

Rice availability per capita: Indochina, *Annuaire statistique 1941–1942*, p. 87; *1943–1946*, pp. 27, 89.

Available data are for 8,211,900 persons of a total Tonkin population of 9,851,200 in 1943, which includes 119,700 in Hanoi and 65,100 in Haiphong.

Population data for 1942 are the population data for 1943 and per capita output may therefore be somewhat understated. Similarly, population data for 1944 are the 1943 population data and per capita output may be overstated or, more likely, somewhat understated because famine deaths would have caused total population to fall between 1943 and 1944.

Paddy output is adjusted for rice on the basis that one ton of paddy equals 0.6349 ton of milled rice, as given in Gourou, *Standard*, p. 13.

Available grams per day assume consumption of 85 per cent of rice output as assumed in Marr, *Vietnam 1945*, p. 97. In comparison, in Tonkin from 1918 to 1930 average human consumption was 80 per cent of total rice production (Office of Population Research, 'French Indo-China, p. 74).

Marr (*Vietnam 1945*, p. 97) argues that 297 grams per day would have been 'perhaps barely enough for everyone to survive until June 1945'.

For coastal provinces the percentage of deaths shown for total and averages includes Hanoi, where deaths were 2.7 per cent of the population and Haiphong where the percentage was 9.4 per cent.

The source lists Phy-ly which was the county town of Ha Nam province. Data for Phy-ly have been included for Ha Nam.

Rainfall: Indochina, *Annuaire statistique 1932–1933*, p. 27; *1934–1935–1936*, p. 12, *1937–1938*, p. 5; *1939–1940*, p. 4; *1941–1942*, p. 13; *1943–1946*, p. 14.

The figure for 1933 is an average for 1907–33.

Famine deaths by province and household: Province 401,273 deaths: AOM, GF/3, Provincial Head, Hai Duong to Kham Sai of Tonkin, 4th day, 6th month (probably 4 June) 1945, Table of the total number of people dead in Tonkin, 1.1.1945–20.5.1945, pp. 3, 48. These figures were compiled by the various provincial governments in Tonkin in response to a request from the government in Hanoi. Household characteristics and deaths: Van and Furuta, *Nan doi Nam 1945 o Viet Nam*.

Age and gender distribution of 40,230 deaths: AOM, GF/3, Ha Dong to Kam Sai, 17 May 1945, p. 14.

Tonkin and Annam area under rice and other crops: Indochina, *Annuaire statistique 1941–1942*, pp. 87–89; *1943–1946*, pp. 89–93; *1947–1948*, p. 10. Data were not published for 1946 and 1947.

Oil seeds include peanuts, castor oil, and sesame.

For 1941 data are available only for the whole of Indochina. Comparison of 1941 and 1942 data suggests significant increases in the cultivation of the non-rice crops of jute and peanuts, but the location of this increase in Indochina cannot be identified.

In 1944 in Annam, average rice productivity was 0.56 tons per hectare, and between 1942 and 1944 an additional 3,200 hectares were devoted to non-rice fibre and oil seed crops. That implies a possible loss of rice output of 1,792 tons, equivalent to 0.83 per cent of rice output in the coastal provinces of North Annam in 1944. Repeating the same calculation for Tonkin indicates a possible loss in hectares of 24,800. Average rice productivity per hectare in 1944 was 0.75 tons per hectare. That implies a possible loss in rice output of 18,600 tons in Tonkin, equivalent to 1.7 per cent of rice output in Tonkin in 1944. Adding North Annam and Tonkin suggests a maximum loss in potential rice output from increased cultivation of fibre and oil seed crops of 20,392 tons of rice. That assumes, however, that land chosen for fibre and oil seed crops had at least the average productivity of rice land as a whole. The possible loss of rice in 1944 of 20,392 tons compares with a total decline between 1942 and 1944 in rice output in the coastal provinces of Tonkin and Annam of 212,900 tons.

Tonkin and North Annam map and centroids: The map uses pre-Second World War provincial boundaries taken from Indochina, *Atlas*. Centroids are calculated using QGIS and adjusting for boundaries current during the famine.

Bomb damage to bridges, Dec. 1944: LHC, MAGIC, 12 Dec. 1944.

