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THE WORK OF E. D. ALVORD IN THE MAZOWE VALLEY

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E. D. ALVORD WAS AN American agricultural missionary whose success at the Mount Selinda Mission led to his being appointed 'Agriculturalist for Instruction of the Natives' in 1926. His idea of training African demonstrators to teach African farmers was adopted by the government, and those demonstrators who were to serve in Mashonaland were trained at the Domboshawa Government School. There Alvord planted a series of crops which demonstrated the success of a particular four-course rotation, the details of which, together with eight photographs, were published in 1928.¹ The four-course rotation was:

- Year 1: Maize fertilized with kraal manure.
- Year 2: Maize or sorghum, no manure.
- Year 3: Groundnuts, beans or other legumes.
- Year 4: Rapoko (finger millet).

After four years a short fallow period during which the land was cultivated was desirable to control weeds.

Experiment and later experience showed that at least one head of cattle was required to provide sufficient manure to keep an acre (0,404 ha) of arable land in good heart. The integration of stock and crops to feed the family on a permanent site would replace the shifting agriculture of the past. The other features of Alvord's programme were demonstration, persuasion and land-use planning across the country. They were summarized in two reports by himself, one printed,² the other in typescript.³

This article deals with his work and that of his staff in the Mazowe Valley. A brief description of the Mazowe Valley and Alvord's association with early afforestation schemes in the Reserves was published in an earlier issue of *Zambezia*.⁴ In mid-1927 a farming demonstrator called Paulos commenced working at Manomano, Makombachoto, Nyanukonda, Musere, Negomo, Chakuchichi and Gweshe in the Chiweshe Reserve under

¹ E. D. Alvord, 'Sand veld farming and its possibilities', *Rhodesia Agricultural Journal* (1928), XXV, 1106.

² [Southern Rhodesia,] 'Ann[ual] Rep[ort] of the Dir[ector] of Native Agric[ulture] for the Year] 1946', in *Rep. Sec[retary] of Native Aff[air]s, Chief Native Comm[issioner] and Dir. Native Dev[elopment] 1946* (Sess[ional] Pap[er], C.S.R. 48, 1947), 37-55.

³ E. D. Alvord, 'Development of Native Agriculture and Land Tenure in Southern Rhodesia' (1958).

⁴ A. G. Davis, 'Afforestation in the Mazowe Valley', *Zambezia* (1988), XV, 119-36.

Alvord's direction.⁵ In the 1927/8 season Paulos had eight plots totalling eight acres (3,2 ha) giving an average yield of 5,5 bags per acre (1 233 kg/ha) of grain with 9,6 bags (2 152 kg) on the best plot (see Table I),

Table I

YIELDS OF GRAIN FROM DEMONSTRATION PLOTS IN FIVE RESERVES
DURING SIX SEASONS

Reserve	Area planted acres (ha)		Number of plots	Average yield bags/acre (kg/ha)		Yield on best plot bags/acre (kg/ha)	
1927/8							
Chiweshe	8,0	(3,2)	8	5,5	(1,233)	9,6	(2 152)
1928/9							
Chiweshe	9,0	(3,6)	-	7,2	(1 614)	14	-
1934/5							
Chinamora	21,5	(8,6)	-	6,4	(1 434)	-	-
Bushu	23,5	(9,4)	-	10,4	(2 331)	-	-
Madziwa	9,5	(3,8)	-	7,1	(1 591)	-	-
Msana	7,0	(2,8)	-	10,1	(2 264)	-	-
1935/6							
Chinamora	28,0	(11,3)	38	16,4	(3 676)	-	-
Bushu	8,5	(3,4)	19	14,9	(3 340)	-	-
Madziwa	10,0	(4,4)	17	17,0	(3 984)	-	-
Msana	11,5	(4,6)	18	16,7	(3 744)	-	-
1936/7							
Bushu	10,5	(4,2)	19	11,6	(2 600)	23	(5 156)
Madziwa	16,5	(6,6)	27	10,0	(2 242)	18	(4 035)
Msana	18,0	(7,2)	23	22,8	(5 111)	29	(6 501)
1937/8							
Chiweshe	8,0	(3,2)	10	12,7	(2 847)	35	(7 847)
Bushu	18,0	(7,2)	36	9,8	(2 197)	20	(4 484)
Msana	16,5	(6,6)	28	15,8	(3 542)	28	(6 277)

Although the names of crops grown were not recorded the best yields were obviously maize.

Sources: *Rep. Chief Native Comm. 1928* (Sess. Pap. C.S.R. 13, 1929), 20; *Rep. Chief Native Comm. 1929* (Sess. Pap. C.S.R. 14, 1930), 80; *Rep. Chief Native Comm. 1935* (Sess. Pap. C.S.R. 7, 1936), 23; *Rep. Chief Native Comm. 1936* (Sess. Pap. C.S.R. 9, 1937), 29; *Rep. Chief Native Comm. 1937* (Sess. Pap. C.S.R. 7, 1938), 27; *Rep. Chief Native Comm. 1938* (Sess. Pap. C.S.R. 20, 1939), 43.

⁵ *Rep. Chief Native Comm. 1927* (Sess. Pap. C.S.R. 18, 1928), 19-20.

compared with an average of 2,6 bags (582 kg/ha) outside his plots.⁶ Rainfall at the Salvation Army's Howard Institute nearby was 26,96 inches (684 mm) over 61 days in that season.⁷ In the following year the plots were increased to nine acres (3,6 ha) in total and gave an average yield of 7,2 bags (1 614 kg/ha) compared with one bag (224 kg/ha) 'on Native lands'.⁸ The rainfall that season was 29,91 inches (759 mm) over 75 days.⁹ In his report contained within that of the Director of Native Development Alvord stated that Paulos had given sixteen lectures and castrated three scrub-stock in the 1928/9 season. His report also contained a map on a scale of 1 : 2 000 000 showing demonstration work on native Reserves, indicating where demonstrators were located and where demonstrators were in training for location in 1930, 1931 and 1932, among them being a demonstrator for Chiweshe in 1931 and Madziwa in 1932.¹⁰

Alvord's lectures and demonstrations stressed the importance of seed selection, the adoption of new varieties, the planting of crops in rows with correct spacing instead of scattering the seed to enable clean weeding, the making of compost and the use of kraal manure. Selective breeding of stock and an explanation of why dipping was compulsory were also part of his instruction.

In 1930 the inclusion of Alvord's report in that of the Director of Native Development was 'precluded owing to expenditure involved',¹¹ and similarly, because of the world depression, demonstration work appears to have ceased in Chiweshe during the seven years subsequent to 1937. An added reason was perhaps the serious outbreak of smallpox in the Mazowe district in 1930 with eighteen deaths among a large number of cases,¹² and this may have diverted his limited staff to elsewhere in the Valley. Certainly he had demonstration centres in Chinamora, Bushu and Madziwa in 1933¹³ and in Msana in 1934,¹⁴ probably on light soils although his reports omit that information. Yields from his plots in Chinamora, Bushu, Madziwa and Msana are shown in Table I. Not included in his report were the yields obtained by Africans from their gardens nearby nor the actual crops grown in his plots.

In 1935 Alvord reported that 'soil erosion damage is increasing rapidly

⁶ *Rep. Chief Native Comm. 1928, 20.*

⁷ *Meteorological Rep. for the Year Ended 30th June, 1928, by the Dep[artmen]t [of] Agric. (Sess. Pap. C.S.R. 25, 1929), 21.*

⁸ *Rep. Dir. Native Dev. 1929 (Sess. Pap. C.S.R. 13, 1930), 81.*

⁹ *Meteorological Rep. for the Year Ended 30th June, 1929 (Sess. Pap. C.S.R. 6, 1930), 23.*

¹⁰ *Rep. Dir. Native Dev. 1929, 80.*

¹¹ *Rep. Dir. Native Dev. 1930 (Sess. Pap. C.S.R. 11, 1931), 28.*

¹² *Rep. Chief Native Comm. 1930 (Sess. Pap. C.S.R. 11, 1931), 3.*

¹³ *Rep. Chief Native Comm. 1933 (Sess. Pap. C.S.R. 9, 1934), 15.*

¹⁴ *Rep. Chief Native Comm. 1934 (Sess. Pap. C.S.R. 8, 1935), 12.*

on Reserves throughout the country . . . [the] usual square or rectangular plot must be changed to plots laid out on contours with terracing, strip cropping and vegetative control'.¹⁵ This advice was adopted in the following year, 1936, when a soil conservation officer, K. J. MacKenzie, was appointed.¹⁶ MacKenzie commenced a soil conservation project in Bushu Reserve and pegged out 10 000 yards (9 140 m) of contour lines, engaged a gang of labourers who completed 2 880 yards (2 632 m) of contour banks together with 2 360 yards (2 157 m) of storm drains protecting some 50 acres (42,4 ha) of land.¹⁷ He developed a standard contour ridge of 18 inches (45 cm) with an average gradient of one foot (30,4 cm) fall in 400 feet (121,9 m) which was adopted on seven projects in the Reserves in 1937.¹⁸ By the end of 1938, 846 acres (342 ha) of land in Bushu had been protected through the use of 59 500 yards (54 383 m) of contours and 16 700 yards (15 263 m) of storm drains at a cost of 6s. 8d. per acre (0,404 ha). This area was only 2,5 per cent of the total area of the Reserve.¹⁹

In the 1935/6 season Alvord's demonstration plots were again very successful (Table I),²⁰ although the rainfall in the Valley was low, for example 23,11 inches (587 mm) at Bindura.²¹ He also had an experimental crop of cotton in Bushu producing a 'promising crop'. The average cash price paid on the spot for 'good middling' cotton was 1½d. per lb.;²² the nearest ginnery was in Bindura. The yields of the grain plots in the 1936/7 season were extremely good (see Table I), but regrettably he did not record if they were from new lands or old ones in which his rotation scheme had been adopted. Cotton seed was supplied to one grower who was paid 1d. per lb. for his crop.²³ In the next season, 1937/8, Alvord achieved a maximum of 35 bags per acre (7 847 kg/ha)²⁴ in Chiweshe (see Table I) when at the Howard Institute nearby the rainfall was 33,5 inches (851 mm).²⁵ In the 1937/8 season all the plot yields were well above the average for the

¹⁵ *Rep. Chief Native Comm. 1935, 30. Rep. Comm. to Enquire into the Preservation, etc., of the Natural Resources of the Colony* (Sess. Pap. C.S.R. 40, 1939), 18. It should be noted that a decade earlier soil erosion had become so serious on some European farms in the Valley that their owners commenced building contour banks. By 1938 some 57 640 acres (23 286 ha) of their arable land in the Mazowe district had been protected.

¹⁶ *Rep. Chief Native Comm. 1936, 27.*

¹⁷ *Ibid.*, 35.

¹⁸ *Rep. Chief Native Comm. 1937, 31.*

¹⁹ *Rep. Chief Native Comm. 1938, 45.*

²⁰ *Rep. Chief Native Comm. 1936, 29.*

²¹ *Rainfall Handbook Supplement No. 2* (Salisbury, Dept. Meteorological Services, 1952), N5.

²² *Rep. Chief Native Comm. 1936, 31.*

²³ *Rep. Chief Native Comm. 1937, 27-8.*

²⁴ *Rep. Chief Native Comm. 1938, 43.*

²⁵ *Meteorological Rep. for the Year Ended 30th June, 1938* (Sess. Pap. C.S.R. 6, 1939), 12.

district, which was 2 bags per acre (448 kg/ha).²⁶ Plot yields, however, are always much higher than field yields, often up to 20 per cent more, even without the ravages of baboons and wild pigs in the fields which are not uncommon in the Reserves. In 1939 the Report of the Chief Native Commissioner contained only an abstract of Alvord's work in the country and no information about the Mazowe District is included in it.

Alvord's soil conservation programme continued in 1940 (see Table II for details of the programme in Chiweshe and Bushu Reserves):²⁷ for the country as a whole he reported that it was a 'most successful season of demonstration work'.²⁸ Also in 1940 he commenced his 'school on wheels' touring African areas.²⁹ This was a single American railway carriage which was pulled from station to station by passing trains. Farmers and their wives would gather at the station to hear talks by an agricultural officer, see lantern slides and inspect pots of plants and other exhibits. Part of the success of this extension method was due to some of the farmers' wives who were former schoolteachers. They read about the new methods in the leaflets handed out by the officer and prodded their husbands into adopting these methods.

Table II

THE ACHIEVEMENTS OF ALVORD'S SOIL CONSERVATION PROJECT IN THE
MAZOWE VALLEY RESERVES, 1940

	<i>Contour ridges constructed</i>		<i>Storm drains constructed</i>		<i>Area protected</i>	
	<i>yards</i>	<i>(m)</i>	<i>yards</i>	<i>(m)</i>	<i>acres</i>	<i>(ha)</i>
Chiweshe	55 178	(50 432)	18 862	(17 239)	525	(212)
Bushu	21 100	(19 285)	-	-	294	(119)

Alvord, despite being able to drive his small truck-load of exhibits into the Reserves, faced a deeply conservative, almost hostile people. Some of the youngest boys had started school (but almost none of the girls because the chiefs opposed the formal education of their daughters³⁰) but certainly none of the older generation had any education. The rural population was also hostile because of the Maize Act (No. 6 of 1925), the Maize Control Act (No. 33 of 1931) and the Maize Amendment Act (No. 17 of 1934) which,

²⁶ *Rep. Chief Native Comm.* 1938, 12.

²⁷ *Rep. Secr. Native Affs and Chief Native Comm.* 1940 (Sess. Pap. C.5.R. 13, 1941), 25.

²⁸ *Ibid.*, 35.

²⁹ *Ibid.*, 36.

³⁰ Nat[iona]l Arch[ives of Zimbabwe, Harare], NSH [Native Dept., Native Comm. and Assistant Magistrate, Mazoe], 2/1/1 [Correspondence: General: 26 Apr. 1916 - 26 Nov. 1923], Native Comm. Mazoe to Archdeacon, Church House, Salisbury, 10 Nov. 1919.

together with the regulations of the Maize Control Board, severely restricted the production and sale of maize grown by Africans in many parts of the country including the Mazowe Valley. These restrictions, along with the Great Depression, imposed appalling hardships on the African families in the Reserves. In 1931 the Chief Native Commissioner commented that it was 'most trying for the native community',³¹ and in 1932 'natives in areas exempt from maize control received better prices generally averaging 7s. 6d. compared with less than 4s. per bag inside the control area'.³²

The Mazoe Native Board in 1934 expressed its 'grave dissatisfaction' with the Maize Acts and also with the Cattle Levy Act (No. 9 of 1934), which increased slaughter fees from 2s. 6d. to 10s.³³ Alvord opposed this punitive legislation, expressing his views in his 1935 report:

the greatest handicap to our effort to introduce better methods of tillage among the Reserve Native is the lack of marketing facilities. In many areas it is impossible for Natives to sell for cash, and they are forced to take salt or cloth for their grain, or they cannot sell it at all... [which] imposes a hand to mouth existence upon him under which he cannot progress.³⁴

Fortunately in 1940 there was a 'strong demand for all classes of agricultural products',³⁵ with the Africans receiving a cash price of 6s. 6d. per bag for their maize delivered to the Control Board's depots on the railways. There was also a provision for a price equalization fund for the benefit of the African grower.³⁶

In the previous year Alvord had commenced 'centralization' in Chiweshe.³⁷ This was the result of an experiment conducted elsewhere in 1929 involving the division of the Reserves into arable, grazing and forestry areas, with new permanent villages sited on the boundaries of the arable lands. Previously, when shifting cultivation was practised, villages were moved to new sites when the nearby cultivated lands became exhausted. These new villages were intended to be permanent and were constructed along a wide path or road with a school, a church, houses, grain bins, sanitation pits and even tree plantations. It was envisioned that lands farmed under the four-year rotation scheme and fertilized by kraal manure

³¹ *Rep. Chief Native Comm. 1931* (Sess. Pap. C.S.R. 7, 1932), 1.

³² *Rep. Chief Native Comm. 1932* (Sess. Pap. C.S.R. 9, 1933), 5.

³³ Natl. Arch., S1542/N2 (Native Affs Dept., Chief Native Comm., Correspondence and Other Papers, General, 1914-43; Native Boards, 1931-9), vol. M, 'Minutes of Native Board Meeting... Chiweshe Reserve, Mazoe District, 12th and 19th June, 1934'.

³⁴ *Rep. Chief Native Comm. 1935*, 31.

³⁵ *Rep. Sec. Dep. Agric. and Lands, 1940* (Sess. Pap. C.S.R. 6, 1941), 2.

³⁶ Southern Rhodesia, 'Ann. Rep. of the Maize Control Board for the Financial Year 1939-40' (Sess. Pap.), 2.

³⁷ *Rep. Sec. Native Affs and Chief Native Comm. 1940*, 4.

together with gardens and livestock would sustain the inhabitants. Initially the area was 4 acres (1.61 ha) but later, in the 1950s, eight acres (3.23 ha) of land was deemed to be the minimum necessary for an economic holding in Chiweshe and that larger areas in low-rainfall regions would be required.³⁸ Centralization commenced in Masembura in 1943, in Madziwa in 1950 and in Msana in 1955 after Alvord had retired.³⁹

In 1941 Alvord's field staff for the whole country comprised 9 European technical officers and 110 African Agriculturalists and Community Demonstrators.⁴⁰ Their achievements in the Mazowe Valley are listed in Table III. A tree plantation was also started in Chiweshe and in the following year the Forestry Officer noted that kraals in the southern portion of Chiweshe had been moved to permanent sites and that 'plantations of Eucalypts established in the past have been cut over and the timber used for building purposes'; these plantations had been established by the Native Commissioner in 1931, the history of which I have outlined previously.⁴¹ Also in 1942 Miss Langham commenced a school on Hasfa Farm on the western border of Chiweshe for the homecraft training of African women and girls.⁴² This, together with the Howard Institute

Table III

THE ACHIEVEMENTS OF ALVORD'S STAFF IN THE MAZOWE VALLEY IN 1941

	Chiweshe	Msana
Villages laid out	41	53
Houses improved	191	368
Churches and schools built	5	2
Grain bins constructed	446	201
Water supplies improved	1	—
Sanitary pits dug	1	—

³⁸ 'Native Land Husbandry Act: Minutes to Meeting of Assessment Committee [Appointed by the Minister in Terms of Section 4 of the Native Land Husbandry Act] for Chiweshe Reserve in the Mazoe District', Sept. 1957.

³⁹ 'Native Land Husbandry Act: Assessment Committee Report on Bushu Reserve: Shamva Sub-District', 22 July 1955; 'Minutes to Meeting of Assessment Committee . . . for Chiweshe Reserve in the Mazoe District', Aug. 1957; 'Minutes of Meeting of Assessment Committee . . . for Madziwa Reserve in the Shamva District', 11 Apr. 1957; 'Minutes to Meeting of Assessment Committee . . . Msana Reserve in the Goromonzi District', 10 Nov. 1956.

⁴⁰ 'Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1941', in *Reps. Secr. Native Affs and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945* (Sess. Pap. C.S.R. 10, 1947), 35.

⁴¹ 'Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1942', in *ibid.*, 89; Davis, 'Afforestation in the Mazowe Valley', 124-5.

⁴² 'Rep. Dir. Native Education for the year 1943', in 'Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1943', in *ibid.*, 130.

established in 1923 within the Reserve,⁴³ provided additional schooling to that provided in Alvord's new village schools.

Alvord's 1943 report gives no information about the Reserves in the Mazowe Valley but he does say that his 1 800 demonstration plots in Mashonaland gave an average yield in excess of 10 bags per acre (2 242 kg/ha).⁴⁴ In 1944 he was appointed to the newly created post of Director of Native Agriculture and his technical staff was increased to 30 Europeans and 219 Africans.⁴⁵ He reported an outstanding development in connection with agricultural extension work which deserved special mention.⁴⁶ In Masembura the Assistant Native Commissioner Bindura 'has induced several hundred native farmers to whom individual lands have been allocated between contour ridges in areas protected by soil conservation works, to put their lands under a systematic four-course rotation crop under the supervision of the demonstrator with astonishing results'. Also using his experience with the Soil Survey Service in the United States⁴⁷ he began the only large-scale systematic mapping of soils yet done in Africa.⁴⁸

During the four-month period December 1943 to March 1944, 247 miles (396 km) of contours were built protecting 6 054 acres (2 445 ha) in four Reserves.⁴⁹ Details of soil conservation works in 1945 in Chiweshe and in Masembura are shown in Table IV. The contours being largely, if not entirely, constructed by hand labour, the total cost of the project was £2 280, or just under £1 per acre (£2 8s./ha).⁵⁰

The success of the extension work was confirmed in 1945 by the Assistant Native Commissioner Bindura, who reported:

production of ground nuts continued to expand and in them the natives of Masembura have found a good cash crop and a valuable one for use in a rotation . . . [It is] estimated that the natives in Masembura sold 1,123 bags of shelled nuts [101,856 kg] this year at an average price of 45s. per bag [90,7 kg], thus a total of £2,531 was poured into the Reserve for groundnuts alone. This is a true benefit to the natives especially when it is realized that five years ago few nuts were grown even for local consumption, let alone for sale. The experiment was started two years ago and included a system of compulsory crop rotation for natives . . .

⁴³ Natl. Arch., NSH/2/1/1 Native Comm. Mazoe to Superintendent of Natives Salisbury, 5 Sept. 1923.

⁴⁴ 'Rep. Secr. Native Affs, Chief Native Comm., and Dir. Native Dev. 1943', in *Reps. Secr. Native Affs and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945*, 138.

⁴⁵ 'Rep. Secr. Native Affs, Chief Native Comm., and Dir. Native Dev. 1944', in *ibid.*, 190.

⁴⁶ *Ibid.*, 191.

⁴⁷ H. Weinmann, *Agricultural Research and Development in Southern Rhodesia 1924-1950* (Salisbury, Univ. of Rhodesia, Series in Science 2, 1975), 207.

⁴⁸ 'Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1944', in *Reps. Secr. Native Affs and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945*, 193.

⁴⁹ *Ibid.*, 199.

⁵⁰ 'Rep. Secr. Native Affs, Chief Native Comm., and Dir. Native Dev. 1945', in *ibid.*, 234.

cultivation in contour ridged areas has proved more satisfactory than anticipated. Natives themselves praise the system which now appears to have taken a firm hold expanding every year and is accepted as a matter of routine. They readily admit that, had they not been forced into the system, there would have been a shortage of food this year.⁵¹

Soil conservation work in 1946 was similar in detail to that listed in Table IV for 1945. In Chiweshe the total area of land protected was 1 472 acres (595 ha) costing £736 or 10s. per acre (£1 4s. 9d./ha). In Masembura the figures were 726 acres (292 ha) costing £944 or 26s. per acre (£3 4s. 4d./ha), respectively.⁵²

The continuing success of Alvord's crop-rotation scheme and the production of groundnuts in Masembura was reported in 1947, as were 'excellent results in soil conservation by the use of grass strips which

Table IV
SOIL CONSERVATION WORK IN CHIWESHE
AND MASEMBURA RESERVES IN 1945

	<i>Chiweshe</i>		<i>Masembura</i>	
	<i>yards</i>	<i>(m)</i>	<i>yards</i>	<i>(m)</i>
Demarcation of drainage channel				
water courses	49 200	(44 900)	30 500	(27 800)
Construction of contour ridges	39 800	(36 300)	56 300	(51 400)
Planting of pasture furrows	—	—	4 500	(4 100)
Construction of storm drains	54 800	(50 000)	20 000	(18 200)
Construction of contour road drains	11 900	(10 800)	13 400	(12 200)
Number of check dams constructed for gully control		1 510		260
	<i>acres</i>	<i>(ha)</i>	<i>acres</i>	<i>(ha)</i>
Area protected	1 875	(757.5)	435.0	(157.7)
Labour in man days		22 000		10 800

Sources: 'Rep. Secr. Native Affs, Chief Native Comm. 1945', in *Reps. Secr. Native Affs and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945*, 234.

⁵¹ *Ibid.*, 210.

⁵² *Rep. Secr. Native Affs, Chief Native Comm. 1946* (Sess. Pap. C.S.R. 48, 1947), 46.

incidentally cost nothing as no contour ridges are necessary'.⁵³ In that year he had 11 staff in the Mazowe district, 1 European land development officer, 1 supervisor and 9 demonstrators, 4 of whom were employed in agriculture, 3 in community work, 1 in forestry and 1 in soil conservation. They were responsible for 4 demonstration centres with 175 plots covering 169,5 acres (68,4 ha) from which the average yield of grain was 13 bags per acre (2 914 kg/ha) and 40 bags of groundnuts were reaped from the trials.⁵⁴

Details of community demonstration work, livestock control and improvement for 1947 and 1948 are set out in Table V.⁵⁵ Four new plantations were established on 18 acres (7,2 ha) and nursery beds were sown with gums and conifers in 1947.⁵⁶ Soil conservation continued in 1947 with 123,2 miles (196,9 km) of contour ridges, 7 100 yards (668 km) of storm drains protecting 1 495 acres (605,2 ha), costing 16s. per acre (£1 19s. 6d. per ha).⁵⁷ More information about soil conservation was given in the 1948

Table V

COMMUNITY DEMONSTRATION WORK AND LIVESTOCK CONTROL
IN THE MAZOWE DISTRICT IN 1947 AND 1948

	1947	1948
Villages laid out	9	7
One-room houses constructed	408	686
Construction of houses with more than one room	5	147
Grain bins constructed	575	784
Schools and churches built	12	8
Compost pits dug	642	818
Sanitary pits dug	11	99
Water supplies improved	2	3
Bulls selected	90	70
Scrub bulls castrated	472	95
Young stock castrated	274	854
Small stock castrated	19	—
Donkeys castrated	8	—

Veterinary treatment was given to 217 animals in 1947 and to 266 animals in 1948.

Sources: *Rep. Secr. Native Affs and Chief Native Comm. and Dir. Native Dev. 1947* (Sess. Pap. C.S.R. 20, 1948), 75, 76; *Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1948* (Sess. Pap. C.S.R. 27, 1949), 80, 83.

⁵³ *Rep. Secr. Native Affs and Chief Native Comm. 1947*, 8.

⁵⁴ *Ibid.*, 73.

⁵⁵ *Ibid.*, 74.

⁵⁶ *Ibid.*, 70.

⁵⁷ *Ibid.*, 81.

report.⁵⁸ Contour ridges totalled over 2,4 million yards (2,2 million m), storm drains 1 600 yards (1 462 m), road drains 648 000 yards (593 000 m) and grass buffer strips 100 000 yards (91 400 m). The area fully protected was 11 130 acres (4 469 ha); 90 acres (36,3 ha) were partially protected at a cost of 2s. 1d. per acre. Also, as detailed in the Report of the Secretary for Native Affairs,

an outstanding movement in soil conservation work was successfully carried out where the land development officer had a number of old style 'crowders' made up from iron railway sleepers and issued them out to groups of people under headmen. He and his African staff then pegged the contour ridges in their arable lands, and the people, using their own oxen and labour without charge to government, constructed ridges. This accounts for the total of 11,131 acres [4 469 ha] protected in the district and which is 66 per cent of the fully protected lands for the province during the year.⁵⁹

Additional sources of potable water were crucial to Alvord's villages with their expanding populations. In 1945 seven boreholes were drilled in the granite which yielded an average 414 gallons per hour at a cost of £106 16s. per hole. Only three of the four holes drilled in the schists were successful, averaging 850 gallons per hour.⁶⁰ In 1946 33 boreholes were drilled in the Reserves and Purchase Areas north of Madziwa at a total cost of £3 118 17s. 3d., that is, an average 14s. per foot (30 cm). Thirty-two holes were successful,⁶¹ the majority of them in the Reserves, benefiting Alvord's new villages. The borehole, with its safe potable water, was and is the key to the intensive development of agriculture in Zimbabwe. The success of that development depends upon healthy people who are not weakened by bilharzia and other water-borne intestinal diseases. The Native Commissioner Concession, whose clinic treated over 5 000 patients with various ailments in 1944, lamented: 'Money is being voted and will be voted to save our natural resources in land . . . can we not ask for more money to be voted to save our human resources in the health and well being of the natives?'⁶²

Alvord's strategy for orderly development was overtaken by the rapid expansion of population and livestock numbers within the confined limits of the Reserves. A measure of the change in Chiweshe is the rise in

⁵⁸ *Rep. Secr. Native Affs and Chief Native Comm. 1948*, 91.

⁵⁹ *Ibid.*, 93.

⁶⁰ 'Irrigation Dept.: Ann. Rep. on Works in Native Reserves and Areas, 1945', in *Reps. Secr. Native Affs. and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945*, 248.

⁶¹ 'Works in Native Reserves and Areas: Ann. Rep. of the Irrigation Dept. . . . 1946' in *Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1946*, 69.

⁶² 'Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1944', in *Reps. Secr. Native Affs and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945*, 163-4.

population from an estimated 13 593 persons in 1929⁶³ to 22 005 in 1948.⁶⁴ However, this scenario is only partially accurate as the 1929 figure was based upon the number of tax-payers multiplied by 3.5, whereas in 1948 the total population was calculated at 5 times the number of families counted. There are no comparable totals for livestock except that cattle numbers for the whole district in 1929 were 20 423, while later in 1948 they were 17 945 in Chiweshe alone which was deemed to be overstocked by ten per cent (see Table VI).⁶⁵

Table VI

PERCENTAGE OF OVER- AND UNDER-STOCKING
IN FIVE RESERVES, 1946-1948

	1946	1947	1948	Area per livestock unit 1948 equivalent	
				acres	ha
Chiweshe	+8	+10	+10	8,5	3,4
Bushu	-9	+1	+4	9,5	3,8
Madziwa	-9	-10	-2	13,6	5,5
Masembura	-8	-8	+10	9,0	3,6
Msana	-4	-15	-14	11,6	4,6

Sources: *Rep. Secr. Native Affs., Chief Native Comm. and Dir. Native Dev., 1946, 49; Rep. Secr. Native Affs., Chief Native Comm. and Dir. Native Dev., 1947, 77; Rep. Secr. Native Affs., Chief Native Comm. and Dir. Native Dev., 1948, 85.*

Overgrazing had become a serious problem in many Reserves, destroying the palatable herbage, causing serious soil erosion and undoing the good work of Alvord's field staff. In 1944 49 Reserves were declared to be overstocked and early in 1945 a destocking plan for each was approved. 'The reduction of the herds . . . was determinate on a percentage basis, according to the size of herd, the smaller owners being exempted during the early stages of the plan . . . [which] was based upon a five-year period in which to bring down the number of stock in the reserve to the carrying capacity prescribed . . . [in] 1944.'⁶⁶ The percentage of overstocking in five Reserves during the years 1946 to 1948 is shown in Table VI, together with the area of grazing available per animal unit in 1948. At that time eight

⁶³ *Rep. Chief Native Comm. 1929, 14.*

⁶⁴ *Rep. Secr. Native Affs and Chief Native Comm. 1948, 88.*

⁶⁵ *Rep. Chief Native Comm. 1929, 85.*

⁶⁶ 'Rep. Secr. Native Affs, Chief Native Comm. and Dir. Native Dev. 1945', in *Reps. Secr. Native Affs and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945, 211.*

acres per unit were little enough in Chiweshe even during a favourable season with a well-distributed rainfall of 32–36 inches (812–914 mm). With a run of dry seasons stock had to be sold or starve. Later the grazing area was increased to 10 acres (4,04 ha) per unit elsewhere but not in Chiweshe. Bushu, with a lower rainfall, was allocated a nine-acre unit (3,63 ha) in 1948. In 1946 the government arranged for the orderly marketing of African cattle by means of weight and grade sales with guaranteed prices,⁶⁷ thereby providing for the sale of the excess cattle in the Reserves. The African was, however, loath to sell his cattle because they were his only capital with the cows earning interest in terms of calves.

Cultivators who adhered closely to the standards of good husbandry laid down by Alvord's staff were rewarded by being nominated first as co-operators, then as plot-holders and eventually master farmers. Their numbers in the Reserves in the Valley are not known. The ratio over the whole country in 1948 was 187 : 1,6 : 1.⁶⁸ A later measure of their good husbandry is the average yield in bags per acre of all grain crops in Chiweshe⁶⁹ for the 1955 season (see Table VII).

Table VII

AVERAGE YIELDS OF GRAIN CROPS IN CHIWESHE FOR THE 1955 SEASON

	<i>Bags/acre</i>	<i>(kg/ha)</i>
Master farmers	10,7	(2 398)
Co-operators	5,6	(1 255)
Plot-holders	10,2	(2 286)
Ordinary farmers	2,4	(538)

Johnson⁷⁰ has detailed the organization of marketing for the African producer. This included the appointment of a marketing officer to Alvord's staff in 1948. He recorded the production of grain in the Mazowe district in that year.⁷¹ The figures are shown in Table VIII. In the ten-year period from 1937/8 the production of grains rose from 157 460 bags to 172 880 bags,⁷² while the area of arable land almost doubled from 98 350 (39 730 ha) to

⁶⁷ *Rep. Secr. Native Affs and Chief Native Comm. 1946, 3.*

⁶⁸ R. W. M. Johnson, *African Agricultural Development in Southern Rhodesia 1945–1960* (Stanford, Stanford Univ. Food Research Institute, 1946), 181.

⁶⁹ 'Native Land Husbandry Act: Minutes to Meeting of Assessment Committee . . . for Chiweshe Reserve in the Mazoe District', Sept. 1957, para. 14.

⁷⁰ Johnson, *African Agricultural Development*, 196–200.

⁷¹ *Rep. Secr. Native Affs and Chief Native Comm. 1948, 97.*

⁷² *Rep. Chief Native Comm. 1938, 12.*

Table VIII

PRODUCTION OF GRAIN IN THE MAZOWE DISTRICT, 1948

	Produced		Sold	
	bags/acre	(kg/ha)	bags/acre	(kg/ha)
Maize	130 000	58 967	71 094	32 248
Rapoko	16 250	7 370	1 246	565
Mhunga	2 870	1 302	301	137
Sorghum	2 010	912	39	18
Groundnuts	20 000	9 072	5 263	2 387
Beans	1 340	609	646	293
Rice	410	186	39	18
TOTAL	172 880	78 418	78 628	35 666

182 490 acres (73 720 ha) during the same period.⁷³ All figures were estimates. Both seasons received average rainfall. This would suggest that yields per unit area of land had declined during the decade, but this is not necessarily so. There were 84 000 acres (33 936 ha) of arable land in Chiweshe in 1948,⁷⁴ but four years later there were only approximately 40 000 acres (16 160 ha) of maize and small grain crops.⁷⁵ This indicates that there was much arable land lying idle, which conjecture is confirmed by Hamilton.⁷⁶ His detailed survey of a sample area near Rosa in 1961/2 found that, on average, 30 per cent of the arable land was lying fallow. Assuming that all the Reserves had a similar proportion of fallow land in 1948, the average yields in the Valley were about two to three bags per acre (448 to 672 kg/ha).

In 1949 a ten per cent tax was levied on the sale of livestock and crops, but not vegetables, under the provisions of the Native Development Fund Act (No. 48 of 1948). The proceeds financed a trust to recover the cost of marketing and contribute towards the development of the Reserves.⁷⁷ In 1952 this levy realized £9 662 from the total sales of maize, small grains, groundnuts and cotton grown in Chiweshe.⁷⁸ In contrast to this levy African

⁷³ *Rep. Secr. Native Affs and Chief Native Comm. 1948, 88.*

⁷⁴ *Ibid.*

⁷⁵ Federation of Rhodesia and Nyasaland, *An Agricultural Survey of Southern Rhodesia Part II: The Agro-Economic Survey* (Salisbury, Government Printer, [1961]), 104.

⁷⁶ P. Hamilton, 'Population pressure and land use in Chiweshe', *Human Problems in Central Africa: Rhodes-Livingstone Journal* (Dec. 1964), XXXVI, 50.

⁷⁷ Johnson, *African Agricultural Development*, 212-13.

⁷⁸ Federation of Rhodesia and Nyasaland, *An Agricultural Survey of Southern Rhodesia Part II: The Agro-Economic Survey*, 104.

farmers received the benefit of a variable subsidy on sales of maize, for example 5s. 11d. in 1948/9 and 2s. 4d. in the following year.⁷⁹

Alvord retired in 1950 and was succeeded by R. M. Davis and the field staff in the Valley continued their extension work. However, because of an increasing human population, increasing livestock numbers and political pressures the benefits which Alvord had brought to the Africans and to their land began to decline. This was revealed in surveys carried out between 1955 and 1957 in four Reserves, which have never been published,⁸⁰ in Hamilton's detailed study of a portion of Chiweshe in 1960/1,⁸¹ and in Johnson's survey of the whole of Chiweshe Reserve.⁸²

The success of Alvord's programme should be viewed in the context of the times. The long years of the Depression and the Second World War dominated the central period of his tenure, which meant that initially there was little money to implement his schemes, and later there was a shortage of materials. Roads were dusty and corrugated in winter and deep in mud in summer. Rivers in flood impeded travel, for there were no high-level bridges. The tarred strips on the main road from Harare to Bindura were completed only in 1938.⁸³ Alvord lived in a European community, many of whom were not sympathetic to his work for the Africans. Some farmers criticized him, others ostracized him because they feared the competition of African producers. Government funds for African agriculture and education were miserly. There were European staff at all levels in the Native Department who were indifferent, even hostile, to his efforts, an attitude I personally encountered later when I attempted to obtain land and advancement for my African graduates.

Alvord's plans for the conservation of the land preceded the organization of the land into land-use classes⁸⁴ and the farm plans⁸⁵ of the Federal Department of Conservation and Extension (CONEX) by some twenty years. Although both Alvord and CONEX owed much to the earlier research in the United States Department of Agriculture, Alvord led the way in Zimbabwe.

⁷⁹ Johnson, *African Agricultural Development*, 215.

⁸⁰ 'Rep. Sec. Native Affs. Chief Native Comm., and Dir. Native Dev. 1943', in *Reps. Sec. Native Affs. and Chief Native Comm. 1941, 1942, 1943, 1944 and 1945*, 138.

⁸¹ Hamilton, 'Population pressure and land use in Chiweshe', 50.

⁸² R. W. M. Johnson, 'An economic survey of Chiweshe Reserve', *Human Problems in Central Africa: Rhodes-Livingstone Journal* (Dec. 1964), XXXVI, 82-108.

⁸³ *Rep. Chief Road Engineer 1938* (Sess. Pap. C.S.R. 8, 1939), 1.

⁸⁴ Federation of Rhodesia and Nyasaland, *Land-use Planning Procedures* (Salisbury, Dept. of Conservation and Extension, 1960).

⁸⁵ At my request one of the first of these plans was prepared by H. R. Hack, Alvord's son-in-law, in 1957; it is shown in A. G. Davis, *The University College Farm in the Agriculture of Rhodesia and Nyasaland* (London, Oxford Univ. Press, Inaugural Lecture Given in the University College of Rhodesia and Nyasaland, 1960), 27-8.

African families in the Mazowe Valley outside the Reserves were the first to acquire ploughs,⁸⁶ and sold their surplus grain to the mines and traders. They continued this practice when they were forced to move into the Reserves where their example encouraged other families to buy ploughs. When Alvord arrived on the scene in 1926, there were 1 038 ploughs;⁸⁷ by 1937 there were 5 580.⁸⁸ Fourteen mealie planters were already in use in Chiweshe in 1932.⁸⁹ The more enterprising families cultivated more land than their neighbours, moving to new sites when the soils of the old area were exhausted. When prices collapsed during the Depression and when growing was restricted under the Maize Control Acts, the enterprising farmers, intent upon maintaining their income, ploughed even more land, land which should have remained grassed to feed the livestock in the Reserve. Good soils were severely limited even on European farms⁹⁰ so some of the new sites must have been on marginal land which was vulnerable to soil erosion. Indeed, in Chiweshe in 1938, after ten years of extension work, farmers were still ploughing large areas there 'up and down the slope'.⁹¹ A situation emerged in which existing families were denied new lands and there was no good land left for newly married couples. Also all cattle had to be taken on a long daily trek for grazing during the dry season. In Alvord's words:

certain more ambitious Natives are hogging large areas of the best land and producing crops for sale. . . . many others cannot find suitable land on which to grow food. We must enforce a redistribution of lands in the Reserves and these men who farm for profit should be requested to buy land in the Native Purchase Areas⁹² . . . tillage will have to be controlled and soil conservation and crop rotation systems enforced.⁹³

His solution was to create centralized, permanent villages, a limit of four to six acres of cultivated land per family, a crop-rotation scheme and the preservation of grazing and forestry areas.

Alvord's pioneering work and his success in the Reserves in protecting the land and creating centralized settlement came to the attention of the Crown. He was awarded an MBE by King George VI on his visit to the colony in 1947. This fame was short-lived. Outside the country, his name

⁸⁶ Natl. Arch., NSH/3/1/1 (Reports: Ann.: Native Comm., 1914), 2.

⁸⁷ *Rep. Chief Native Comm. 1927*, 13.

⁸⁸ *Rep. Chief Native Comm. 1937*, 11.

⁸⁹ *Rep. Chief Native Comm. 1932*, 5.

⁹⁰ A. G. Davis, 'Land use in the Mazoe Valley: Land capability classification', *Rhodesia Agricultural Journal* (1976), LXXIII, 65-71.

⁹¹ Quoted in T. O. Ranger, *Peasant Consciousness and Guerrilla War in Zimbabwe* (Harare, Zimbabwe Publishing House; London, Currey, 1985), 72.

⁹² *Ibid.*, 71.

⁹³ *Ibid.*, 95.

and work were not recognized. Alvord is not mentioned in Allan's wide-ranging account of the use of land by the African husbandman,⁹⁴ nor in Hudson's *Soil Conservation*,⁹⁵ although both authors had worked in central Africa. Inside the country Alvord's scheme of centralization was overtaken by events in the 1950s which led to attempts by the government to register land rights under the Native Land Husbandry Act (No. 52 of 1951).⁹⁶ This Act was strongly opposed by the inhabitants of the Reserves and was repealed in 1962.

Centralization may have been a two-edged sword for, although it protected the land, it prevented many progressive leaders in the community from farming for profit. Few, if any, of these leaders were good farmers, and few adopted the a plan of crop-rotation and fertilizing the land with kraal manure which would maintain and improve the fertility of the soils. However, at the time, Alvord and his staff were right in pursuing the goal of conserving the land in the Mazowe Valley for the benefit of posterity.

Acknowledgements

I am indebted to the National Archives in Harare, Zimbabwe, and to the Public Record Office, Kew, for access to the records upon which this study is based.

⁹⁴ W. Allan, *The African Husbandman* (Edinburgh, Oliver and Boyd, 1965).

⁹⁵ N. Hudson, *Soil Conservation* (London, Batsford, 1971).

⁹⁶ *Rep. Advisory Comm. on the Dev. of the Economic Resources of Southern Rhodesia with Particular Reference to the Role of African Agric.* [Chairman: J. Phillips] (Sess. Pap., C.S.R. 15, 1962), 147.