

FEDERATED MALAY STATES.

REPORT BY THE DIRECTOR OF PUBLIC WORKS FOR THE YEAR 1913.

EXPENDITURE.

The total expenditure on Public Works was \$10,410,080, made up as follows:

Votes in charge of	On State Estimates.	On Federal Estimates.	Total.
State Engineer, Perak	\$3,553,125	\$150,590	\$3,703,715
„ „ Selangor	3,227,649	...	3,227,649
„ „ N. Sembilan	1,216,603	8,314	1,224,917
„ „ Pahang	1,251,942	60,574	1,312,516
Government Architect ... ..	...	593,715	593,715
Executive Engineer, Factory ... ..	...	22,600	22,600
Irrigation Engineer ... ..	...	23,358	23,358
Superintendent, Stores & Furniture... ..	...	127,157	127,157
Director of Agriculture ... ..	...	30,799	30,799
Director of Public Works ... ..	...	143,654	143,654
Total ...	\$9,249,319	\$1,160,761	\$10,410,080

The payments made on account of personal emoluments amount to \$586,844, or 5.64 per cent of the whole, which leaves a balance of \$93,187 on the Establishment Estimates.

2. Similar totals for the five preceding years are given below:

1908	\$7,896,212
1909	6,797,402
1910	6,302,595
1911	7,070,015
1912	8,025,703

There has therefore been a considerable increase in the amount of work done.

3. The unexpended balances amount to \$4,832,037, money having been voted for many items which were not even begun. Some of these were postponed because the requirements had not been determined or the necessary land acquired, and other items were delayed by the same causes, whilst in a few cases plans could not be got ready; but the principal cause of money not being spent was that reliable contractors and sufficient labour were not available. Supplies ordered through the Crown Agents also did not arrive when due owing to strikes in England.

4. A statement showing the estimated and actual expenditure under different headings of the budget is put up herewith.

BUILDINGS.

5. The principal Federal buildings under construction during the year were the new Supreme Courts, extensions to the Museum, the Chandu Monopoly Offices, completion of the High Commissioner's Lodge and a Mess-house for police and survey probationers, all at Kuala Lumpur; the new Quarantine Station at Port Swettenham; and extensions of the Lunatic Asylum at Tanjong Rambutan.

Those being carried out from State Estimates include new Abattoirs at Kuala Lumpur; the Perak State Mosque at Kuala Kangsar; an Infectious Diseases Hospital and an Infants' School attached to the King Edward VII School at Taiping; new Hospital, Town Hall with Post Office and Fire Station at Ipoh; a new block of offices at Seremban; and new offices with Court-house at Kuantan. Other items classed under the heading of Works and Buildings on which progress was made were additions and improvements to Kuala Lumpur Waterworks; increased storage at Ayer Kuning for Klang water supply; extension of river embankment wall and river deviation at Kuala Lumpur; reconstructing the town drains at Taiping; drains for Bagan Datoh village; water supply for the Lower Perak delta; water supply for estates along the Sungei Siakup road and Kuala Kurau; drainage and water supply for Raub; a second outfall drain for Kuantan; and water supply for Beserah.

The sums provided for these make a total of over \$3,000,000, but there were in all 858 items in the Estimates for which \$6,474,719 were voted. Several large items were postponed for further consideration or delayed for reasons not controlled by the Public Works Department, and included the following:

Five wards for lepers at Pulau Jerejak; Hospital for Sungei Siput; Klang river improvements; and electric lighting, Seremban town.

ROAD CONSTRUCTION.

6. The expenditure on road construction was \$959,202, resulting in the completion of $77\frac{3}{4}$ miles of new roads and progress on other sections not completed.

The roads under construction were:

For Perak: Klian Intan to Baling (partly in Kedah) and branch off main road to Kuala Temelong, in Upper Perak district; from Tronoh southward, Kuala Diepang to Malim Nawar, Lahat to Sungei Raia, and Tanjong Rambutan to Chemor, in Kinta district; Sitiawan to Likir, Jendarata to Bagan Datoh, and the Banjarese road at Telok Anson, in Lower Perak district; and Changkat Loba to Bukit Merah in Krian district.

For Selangor: Sungei Boyan extension, Kepong to the Kuala Selangor boundary, and deviation at 4th mile of the Cheras road, in Kuala Lumpur district; Java Street extension in Kuala Lumpur town; Pandamaran road deviation in Klang district; Morib to Sepang, Sungei Bauia road extension, and Telok Datoh towards Bangi, in Kuala Langat district; Semenyih to Bangi and Bangi towards Telok Datoh in Ulu Langat district; Jalan Rajah and Jalan Rajah Abdullah extension, in Kuala Selangor district; and Penghalan Kundang to Kuang in Ulu Selangor district.

For Negri Sembilan: Sepang to Batang Banar and Rantau, to Ulu Sawah in Seremban district; Lukut to Kuala Lukut in Coast district; and Ulu Pemas to Kundor in Tampin district.

For Pahang: Benta to Kuantan, on which 22 miles were metalled during the year leaving $25\frac{1}{4}$ miles still to be done; branch to Luboh Paku Railway Station to Pahang river at Kuala Kran; Gap to Tranun reconstruction on the Kuala Kubu-Raub road; and street extensions at Kuantan.

A path from Kuala Lipis to Gunong Tahan, 54 miles in length, also in course of construction, was nearly completed.

7. A bridge of five spans of 60 feet, under construction at Telok Datoh in the Kuala Langat district of Selangor, was seriously delayed through the contractors having omitted to provide themselves with suitable plant for sinking cylinders. The work was taken out of their hands in September and is being pushed on very successfully by the Public Works Department Factory.

8. The lengths of roads and paths existing at the beginning and close of 1913 are shown in the following statement:

	Cart-roads.				Bridle-roads and paths.	
	Metalled.		Unmetalled.			
	1st Jan.	31st Dec.	1st Jan.	31st Dec.	1st Jan.	31st Dec.
	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.
Perak	751 44 $\frac{1}{2}$	775 71	60 32	71 78 $\frac{3}{4}$	871 73	912 54
Selangor	656 72	686 38	64 62	68 11	174 69	176 02
Negri Sembilan	397 36	398 12 $\frac{1}{2}$	24 01	27 10	246 49	236 43
Pahang	271 01	302 52	68 13	43 48	266 74	316 14
Total	2,076 73 $\frac{1}{2}$	2,163 13 $\frac{1}{2}$	217 28	210 67 $\frac{3}{4}$	1,560 25	1,641 33

ROAD MAINTENANCE.

9. The expenditure on the maintenance of metalled cart-roads was, approximately, \$2,056,870, the length upkeep being 2,033 miles and the average cost per mile \$1,011.75, but town streets are included.

10. The methods of upkeep adopted were chiefly those followed in previous years. In Selangor there has been an increased mileage surfaced with tarco, which has worn well in most cases and afforded some protection to the metal, whilst preventing stones being displaced and considerably reducing dust. The length thus dealt with in this State is now $35\frac{1}{2}$ miles.

It is unfortunate that the Kuala Lumpur district, some of the roads in which have probably the heaviest traffic in the Federated Malay States, has no really good metal, but an extended use of tarco may do a great deal towards overcoming this difficulty, and it is in such cases that a protective carpet is most advantageous, though further experience is required with regard to the best means of repairing and renewing it.

In Perak attention has been given chiefly to early repair of pot-holes and the use of stone capable of withstanding the pounding of motor bus traffic, which has been attended with a considerable measure of success. The main road through Tapah, Kampar, Gopeng and Ipoh, portions of which were very bad not long ago, is now in quite fair order and shows that water-bound macadam can be upkept under existing conditions if good stone is available. It is chiefly, therefore, with the object of reducing cost and dust that the addition of other materials would seem to be desirable.

In Negri Sembilan small lengths of tarco have been laid, but the practice here and in Pahang is chiefly the same as in Perak.

A short section has been laid with tar macadam in Perak and another with concrete in Selangor, but these have not been done long enough to afford definite information with regard to their advantages.

IMPROVEMENT OF EXISTING ROADS.

11. Further expenditure was incurred in the improvement of these roads as under :

	Permanent bridging.	Improvement of surfaces.	Widening, raising, raising corners, etc.	Total.
Perak ...	\$121,008	\$ 56,295	\$ 62,123	\$239,426
Selangor ...	103,033	159,736	292,685	555,454
N. Sembilan	23,774	45,390	72,925	142,089
Pahang ...	5,170	—	2,202	7,372
Total ...	\$252,985	\$261,421	\$429,935	\$944,341

IRRIGATION AND AGRICULTURAL DRAINAGE.

12. No important new works for irrigation were undertaken during the year. A small sum had been provided for commencing those proposed at Pulau Tawar, in the Pahang Estimates, but there was no officer available to take charge. Rather extensive surveys were made for proposed works near Bota on the Perak river, but these show the country to be broken and perhaps suitable only for small separate schemes instead of the larger one for which they were intended.

The drainage of land for coconut estates in the Lower Perak delta made good progress in spite of difficulties regarding control of the water gates, which arose from more immediate requirements of the planters. Forty-seven and a half miles of new drains were cut and $16\frac{1}{2}$ miles of canal were deepened, five new outlet gates being constructed on the latter. Extensions of agricultural drains in the Coast districts of Selangor are the only other items of any consequence—

The expenditure for the year was :

	Construction.	Maintenance.
Perak ...	\$138,173	\$81,231
Selangor ...	25,075	10,641
Negri Sembilan ...	1,128	—
Total ...	\$164,376	\$91,872

ANTI-MALARIAL DRAINAGE.

13. The expenditure on works in Kuala Lumpur was as below :

	Construction.	Maintenance.
On Federal Estimates ...	\$34,397	\$7,890
„ Selangor „ ...	28,643	9,346
Total ...	\$63,040	\$16,936

In the area dealt with, 109,186 lineal feet of sub-soil pipe drains were laid, 8,966 lineal feet of masonry drains were constructed, and 25,288 lineal feet of earth channels were cut.

Works carried out in Seremban, Klang, Kuala Langat and other districts were also classed under this heading though most of them combine reclamation with drainage in a greater or less degree.

The results for Kuala Lumpur are good as there has been a large reduction in the number of cases of malaria and the works appear to stand well, affording promise of their being permanent.

RIVER CLEARING AND IMPROVEMENTS.

14. In Perak, snagging barges were employed on the Kinta and Bidor rivers and considerable improvement is reported in the case of the latter.

In Selangor, work was done, varying in character but with the same object in view, on the Klang, Buloh, Selangor and Rawang rivers. A launch was purchased for this work intended to be used chiefly on surveys, and these were put in hand.

In Negri Sembilan, portions of the Labu, Linggi, Kenaboi, Triang, Muar, Jelai, Merbau S'Ratus, Rembau and Pedas rivers were cleared or straightened, the expenditure being \$7,834.

In Pahang there was expenditure amounting to \$1,460 for similar items.

It is important that schemes for river improvement in the older States should be prepared as the opening up of land accelerates the rate at which water flows off and finds its way into the rivers.

KUALA LUMPUR ELECTRIC LIGHT WORKS.

15. The expenditure on improvements and extensions, consisting chiefly of relaying cables, erection of a new power house and provision of Diesel engines, was \$188,155, which increases the capital to \$1,369,700, and the running expenses were \$92,252, whilst the revenue earned, including the value of street lighting not paid for, was \$135,866, which shows a return of \$43,614, or nearly 3.2 per cent. on the present capital if nothing is written off for depreciation.

Very few stoppages occurred and the working was generally satisfactory. The water power required to be supplemented only during 408 hours by the steam plant.

FACTORY.

16. The Executive Engineer's statements show the value of business done to be \$538,247; and the profit, after allowing for depreciation of the buildings and plant, as \$44,463.57. The capital is put down at \$270,067 and the returns amount to nearly 16½ per cent. on this amount.

The cost of staff, including all allowances, was \$30,819.74, being 7 per cent. of the expenditure.

DREDGING.

17. The dredger was employed at Port Swettenham up to the 20th March, and arrived at Kuantan on the 23rd April, remaining there until the 31st October or for a period of 192 days out of which dredging was done on 171 days; eight days were occupied in preparations for the commencement of work on arrival and for departure of the dredging fleet to Singapore at the close of the season, and only 13 days were lost through bad weather and necessary repairs.

The work was pushed on with all possible despatch in order to complete a channel through the bar, and this was accomplished. It is only 100 feet in width, but may be sufficient to induce scour and perhaps make it more permanent than former channels which have never reached deep water in the harbour and have tended only to increase the depth over a wider area, the cuts made being nearly obliterated before operations could be resumed.

Owing to dredging being carried on sometimes in rough weather, the vessels and machinery required rather extensive repairs when overhauled on their return to Singapore, but there were no serious accidents such as have occurred in several previous years, and the officers employed on the vessels would seem to have paid closer attention to their duties.

The length of channel dredged was 9,900 feet, the quantity of material raised being 260,912 tons or 5,172,061 cubic feet. The Acting State Engineer shows the working expenses at Kuantan per ton to have been 16½ cents, whilst in 1912 they were 21 cents. These figures, in both cases, do not include the expenditure on journeys to and from Kuantan or repairs and the stores provided for general maintenance, which were not paid for by him.

After being overhauled at Singapore the dredger and the "Sri Tunda" proceeded again, with two hopper barges, to Port Swettenham at the end of December, the two remaining barges being lent on hire to the contractors for Singapore harbour works.

18. Very considerable help has been rendered by the Surveyor-General of Ships in this year, as in the past, in supervising repairs, engaging officers for the staff and expediting all arrangements for the vessels which were under his charge when in Singapore.

WATERWORKS.

19. The expenditure for the year is given below :

					Construction		Maintenance
Perak	...	...	...	...	\$191,464	...	\$65,083
Selangor	...	...	...	...	88,085	...	47,415
Negri Sembilan	...	...	...	...	6,071	...	11,435
Pahang	...	...	...	...	32,236	...	5,091
Total	...	...	...	...	\$317,856	...	\$129,024

Perak.—The extensions were chiefly for supplies to estates in the Krian and Lower Perak districts, considerable progress having been made with the former.

Selangor.—A settling tank for Kuala Lumpur town supply, increase of storage reservoir capacity for Klang, and increased catchment area and storage with a connection to the Coast water supply for Kuala Selangor are the principal items.

Negri Sembilan.—A new filter bed at Kuala Pilah and a supply to the cooly lines and rubber store at Gunong Angsi have been completed.

Pahang.—New works were in hand for supplying Raub and Beserah, the latter being completed, and some progress was made with those for Pekan, which included completion of the well begun in 1912.

BRANCHES

20. The Federal staff of the Public Works Department now includes special branches for Architecture, the Factory, Irrigation, Stores and Furniture, and Anti-Malarial Works, the last of which was added during the year and not provided for in the Estimates.

21. The Government Architect's Branch extended the field of their work, having taken immediate charge of construction for some of the more important new buildings in Ipoh and Kuala Kangsar, and the Assistant Architect has made the former his head-quarters.

They have also carried out some of their works departmentally, securing better workmanship with economy in cost. It is anticipated that the new building for the Chandu Monopoly Department in Kuala Lumpur will be finished for \$16,000 less than the lowest tender received. Both these departures seem worth adopting on a larger scale as it is necessary to relieve the Executive Engineers of some of their duties in the principal centres and to keep a check on prices.

22. The Factory has been established a long time and is able to show satisfactory results on most of the works undertaken there.

23. The Irrigation Branch was formed for carrying out new works, the maintenance of those existing not being included in their proposed duties. It was necessary, however, for Mr. Smail, Irrigation Engineer, to take charge of the Krian Irrigation during several months, the Executive Engineer on this having been invalidated home, and only one Assistant Engineer remained to be employed in the manner proposed up to the end of September, when Mr. Pearson, III Grade Executive Engineer, joined the staff from Ceylon. The officers of this branch have necessarily to prepare schemes before carrying them out, and their work must for some years consist chiefly in collecting information on which new schemes can be based.

24. The Stores and Furniture Branch took up some of its duties in April, when a Superintendent was appointed who had a large amount of work thrust on him in supplying furniture under the new scheme for officers' quarters before appointments in his staff had been filled and the State stores taken over. It was impossible under these circumstances to organize the work properly, but the position is now better.

The creation of this branch has relieved local Public Works Department officers of a portion of their former duties connected with furniture and of the additional work belonging to "scheme furniture."

25. The Anti-Malarial Branch has accomplished some satisfactory work for the Malaria Advisory Board, but has been prevented by want of officers from undertaking all that they desired, several votes provided in the Estimates for this purpose having remained unexpended. Mr. Evans, the Executive Engineer, was called on to advise regarding private work on estates, and his only Assistant Engineer up to the end of August left to join a private firm in Singapore.

STAFF.

26. The number of Civil Engineers on the Establishment Estimates was 63, with one Mechanical Engineer as assistant at the Factory. During the year, however, five additional appointments were sanctioned for anti-malarial works, bringing the approved total for the former up to 68. On the 1st January, 1913, 57 Civil Engineers' appointments were filled, and on the 31st December, 1913, 63, the following changes having taken place: Mr. Tickell, Assistant Engineer, was retired on pension; Mr. Moore, Assistant Engineer, resigned his appointment after seven months' leave in England; Major MacDermott, III Grade Executive Engineer, was transferred temporarily to Kelantan; and Messrs. L. Bowen and R. C. Drew, Assistant Engineers, were transferred to Johore; whilst additions to the staff were made by the transfer from Ceylon of Mr. Pearson to be a III Grade Executive Engineer; the appointment of eight Assistant Engineers in England and the engagement of one Assistant Engineer in India and one locally.

27. The Government Architect's staff was increased by one more European Assistant, and an additional Assistant Engineer was added to the staff for Electric Light Works, bringing up the totals to four Architects (two of whom are classed as Draftsmen) and five Electrical Engineers.

J. TRUMP,
Director of Public Works, F.M.S.

STATE ESTIMATES.	Personal Emoluments.		Other Charges.							
	Estimated.	Actual.	Annually Recurrent.		Special Expenditure.		Special Grants.		Annually Recurrent.	
			Estimated.	Actual.	Estimated.	Actual.	Estimated.	Actual.	Estimated.	Actual.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Perak	161,241 00	144,742 79	157,213 00	129,024 28	12,410 00	8,769 82	4,225 00	3,616 79	179,750 00	154,588 13
Selangor	214,567 33	188,268 98	211,584 00	177,841 76	249,499 00	189,985 64	...	...	126,455 00	120,668 20
Negri Sembilan	79,406 00	76,772 35	41,165 00	34,909 90	406 00	390 10	...	...	31,000 00	47,230 26
Pahang	95,526 60	79,617 64	35,498 00	27,360 61	...	...	...	...	38,200 00	35,979 50
Total ...	550,740 93	489,401 76	445,460 00	369,136 55	262,309 00	199,145 56	4,225 00	3,616 79	375,405 00	358,466 09
FEDERAL ESTIMATES.										
Perak ... ..	...	...	8,434 00	7,212 43	...	...	52 50	52 50	15,950 00	13,222 20
Selangor ... ..	...	...	...	...	...	...	...	...	...	...
Negri Sembilan ... ..	...	...	810 00	596 15	...	...	...	...	500 00	88 93
Pahang ... ..	...	...	...	...	3,300 00	3,256 31	...	...	42,884 00	42,883 67
D.P.W. Office	70,099 29	61,642 97	7,254 00	5,691 75	...	...	...	...	52,116 00	52,110 33
Govt. Architect's Office ... ..	...	...	2,895 42	2,659 51	29,831 75	28,228 61	...	...	27,700 00	26,778 76
Ex. Engineer, Factory	21,929 00	12,276 33	13,100 00	10,324 12	...	...	...	...	...	...
Irrigation Engineer	21,283 00	12,637 43	7,880 00	6,037 78	6,825 00	4,682 69	...	...	...	...
S. and F. Department	15,979 00	10,885 92	15,451 00	7,555 73	125,336 56	108,714 98	...	...	...	...
M. A. Board ... ..	...	...	...	...	30,800 00	30,798 96	...	...	...	...
Total ...	129,290 29	97,442 65	55,824 42	40,077 47	196,093 31	175,681 55	52 50	52 50	139,150 00	135,083 89

Roads Streets and Bridges.				Irrigation and Drainage.						Miscellaneous Services.		Total.			REMARKS.
Special Services.		Special Grants.		Annually Recurrent.		Special Services.		Special Grants.		Estimated.	Actual.	Estimated.	Actual.	Unexpended Balance.	
Estimated.	Actual.	Estimated.	Actual.	Estimated.	Actual.	Estimated.	Actual.	Estimated.	Actual.						
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
1,010,589 34	488,898 57	491,300 46	79,131 26	79,820 00	78,999 79	191,920 60	148,202 84	10,300 00	2,594 22	...	...	5,655,411 27	3,553,125 37	2,102,285 90
1,345,538 00	800,424 65	...	...	12,690 00	10,641 02	34,680 00	25,974 75	...	...	8,850 00	3,257 71	4,564,789 68	3,227,648 77	1,337,140 91
305,369 00	193,299 13	...	...	...	...	...	...	...	...	500 00	500 00	1,747,205 00	1,216,602 80	530,602 20
847,033 00	557,013 95	...	...	...	...	...	...	...	...	1,500 00	1,065 64	1,639,086 63	1,251,942 33	387,144 30
3,508,529 34	2,039,636 30	491,300 46	79,131 26	92,510 00	89,640 81	226,600 60	174,177 59	10,300 00	2,594 22	10,850 00	4,823 35	13,606,492 58	9,249,319 27	4,357,173 31	
1,130 00	448 25	...	...	...	...	...	...	...	...	...	...	269,267 56	150,590 15	118,677 41
...	...	...	...	...	...	...	...	...	...	...	...	26,250 00	8,314 34	17,935 66
...	...	...	...	...	...	...	...	...	...	...	...	66,184 00	60,574 01	5,009 99
2,150 00	2,137 32	...	...	...	...	...	...	...	...	...	...	158,217 94	143,654 18	14,563 76
...	...	...	...	...	...	...	...	...	...	...	...	857,123 01	593,715 28	263,407 73
...	...	...	...	...	...	...	...	...	...	...	...	35,029 00	22,600 45	12,428 55
...	...	...	...	...	...	...	...	...	...	...	...	35,988 00	23,357 90	12,630 10
...	...	...	...	...	...	...	...	...	...	...	...	156,766 56	127,156 63	29,609 93
...	...	...	...	...	...	...	...	...	...	...	...	30,800 00	30,798 96	1 04
3,280 00	2,585 57	...	...	...	...	...	...	...	...	...	...	1,635,626 07	1,160,761 90	474,864 17
Kept by Director of Agriculture															