

EXECUTIVE SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF NINE RIVERS IN MIZORAM, 2019

In compliance of the orders of the Hon'ble NGT on OA No. 673/2018
dt. 20.09.2018, 19.12.2018 & 08.04.2019

Prepared by

RIVER REJUVENATION COMMITTEE (RRC)
GOVT. OF MIZORAM

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EXECUTIVE SUMMARY OF THE ACTION PLAN FOR THE NINE(9) RIVERS OF MIZORAM

In compliance to the orders of the Hon'ble NGT dated 20.09.2018, 19.12.2018 & 08.04.2019 in the matter of OA No. 673/2018 - *M.C Mehta-Vrs-Union of India & Ors related to the News item dated 17.09.2018, published in "The Hindu" under the heading "More river stretches are now critically polluted "*, River Rejuvenation Committee (RRC), Govt. of Mizoram has prepared Action Plan for conservation of nine(9) rivers in Mizoram, which are identified to be polluted by CPCB based on BOD level during 2016 and 2017.

The nine (9) identified polluted rivers are :

- i) 1 river (*Tiau*) - **Priority III**
- ii) 3 rivers (*Tlawng, Tuipui and Tuivawl*) - **Priority IV**
- iii) 5 rivers (*Chite, Mat, Saikah, Tuikual and Tuirial*)- **Priority V**

The Action Plan is prepared for conservation, rather than rejuvenation of the rivers since the identified 9 polluted river stretches in Mizoram are already within the prescribed limits of BOD (Data annexed), preparation of action plan for rejuvenation of these rivers for bringing down the BOD level does not arise for these rivers. However, understanding the importance of conserving natural water sources to their pristine quality, the RRC prepared the Action Plan aiming for control of potential sources of pollution, and conserving catchment areas. Following are the major sources of river pollution in Mizoram based on which the Action Plan is formulated.

i) Municipal solid waste /sewage

Mizoram is a small state, industrially backward compared to other states, however, population growth, increasing volumes of municipal waste and lack of proper treatment and disposal systems for it have become major issues posing threats to the quality of fresh water resources in the state. Waste generated in Mizoram is estimated to be 165 TPD. For disposal of municipal waste, open dumping is in practice and waste segregation and scientific disposal system is yet to be implemented. At present, the state capital, Aizawl has only two dumping sites which is about 15-20 km from the City. This has led to indiscriminate dumping of wastes in public drains and open spaces in certain areas. Same scenario is observed in other urban and rural areas of the state, ultimately resulting into degradation of nearby water quality and depletion of fresh water resources.

Again, with regard to sewage management, at present there is no sewage management or disposal system. The state is yet to set up Sewage Treatment Services for cities/towns.

Domestic waste water including kitchen and bathroom waste are discharged into open drains along the road network which finally flow downstream into the rivers. No septic tank is connected sewerage network. One of the major factors contributing to river water pollution in the state is the unhygienic disposal of effluents of septic tanks and seepages into the drains and water bodies.

3) *Siltation and soil erosion*

Being a hilly terrain, with the heavy monsoon rain and deforestations, encroachments and exploitation of the catchment areas, siltation is a common problem in Mizoram. Landslides are also common occurrence in the state. During rainy seasons, surface waters are heavily turbid resulting into rise of pollutant levels. Mizoram as a whole receives good amount of rainfall (2000mm – 2500mm) annually but mostly for 4-5 months leaving the remaining months without or with very little rain. The high intensity precipitation on steep slope of the area render the rain prone to various forms of erosion hazards. Heavy run off results in detachment of top soil, which is transported and deposited in the lower reaches. Unscientific land use practices (Jhumming), deforestation, lack of proper scientific soil and water management measures etc accelerate erosion. The steep topography minimizes the time of concentration (Tc) which results in poor soil moisture storage, ground water recharge and drying up of streams, wells and ponds. This makes negative impacts on agricultural production and productivity and also results into pollution of water sources. Hence, proper scientific methods of river catchment management is very much needed for control of soil erosion and siltation for conservation of rivers in Mizoram.

4) *Industries*

Mizoram has been said to be industrially backward state and industrial activity is dominated by Small Scale Industry. Major industrial units of Mizoram are agro and forest based industries together with handloom, handicrafts, tea, food processing, dairy, bamboo chipping, broom, agarbati stick industry, electronics, consumer goods industries, sericulture, cement clinker grinding units, food and allied products processing units, stone crushing units, carpentry workshops, meat processing units, brick making units, bamboo processing units and power generating plants. As such, due to limited number of water polluting industries in the state, industrial effluents may not be considered a major contributing factor to water pollution as of now. However, in the absence of proper regulatory mechanism for checking industrial effluents, the existing industries in the state, small and limited in number they may be, could have a devastating effect on water quality. Besides, the state is witnessing development in industrial sector during the past years with highly pollution industries and projects coming up in the state with higher potentials of causing surface and

groundwater pollution, such as, Oil drilling, roads construction, iron industry, power plants etc. Hence, Mizoram would soon be facing more water pollution problems due to industrial effluents and wastes. Hence, control of water pollution from industries by ensuring compliance of effluents standards is need of the hour for conservation of rivers and other water resources.

On the basis of potential polluting sources of the rivers of Mizoram, source identification and records available with various stakeholder departments, Action Plan is formulated for conservation of the 9 rivers of Mizoram with focuses on the following activities:

1. Control of municipal waste/domestic sewage

A. Setting up of sewage management system in the catchment areas.

i) Sewerage Treatment Plant (STP)

There is no existing sewerage system in towns. Each house has separate septic tank and some of the households discharge sewage directly into natural nallas/ storm water drains. The storm water drains are being used to carry the waste water as well, which is turn, increasing the pollution and causing serious health hazards. As It is essential to provide adequate sewerage system to stop or reduce waste water pollution in natural drainage system, a proper sewerage treatment plant is therefore proposed to set up in towns located in the catchment areas of the rivers which are planned and designed based on CPHEEO guidelines, taking into account the local topographical constraints.

ii) Onsite Liquid Waste Treatment.

Water Management for rural areas from the analysis of the sources of waste water and its types, it is revealed that more than **90 percent** of waste water generated is greywater (refers to waste water from bathroom, washing of clothes and kitchen). Therefore, greywater management is a major challenge in rural areas in the country. For effective management of water, it is essential to focus on management at household level. In case it cannot be managed at household level, management at the community level should be done.

As such, graywater management and treatment system has been proposed for those rural settlements in the catchment areas of the rivers for which viable technological options such as Kitchen Garden with piped root zone system, Kitchen Garden without piped root zone system, Leach pit and Soakage pit are considered to adopt.

B. Proper Solid waste management system

The present system of solid waste management needs to improve in line with Solid Waste Management Rules 2016. Some proposed actions for improving solid waste management system in the catchment areas include **Baseline survey, promoting of segregation of waste, adopting systematic collection and transportaion system and scientific final disposal system.**

2. River catchment management

A. Plantation in the catchment areas:

It is proposed to take up afforestation activities in the catchment areas of the 9(nine) rivers. Catchment area will be treated through afforestation in the form of Aided natural Regeneration (ANR) with 200 plants per hectare with conserving the natural trees already existed to improve canopy density and quality of the forest with the object to reduce siltation and increase moisture retention in the catchment area. Some of the rivers have been notified as Riverine Reserve Forest (RRF) wherein 800metres on either side of the rivers have been notified as RRF which do not require constitution of buffer zone and Land Slide Control Scheme

3. Source Control - Industrial Pollution Control

- Inventorization of industries located in the catchment areas & categorization and disposal mode/status of ETP
- Regulating treatment, disposal mode and ensuring compliance of standards for functional ETP

4. Rain water harvesting, ground water charging

In order to conserve water resources and prevent pollution of rivers due to rainwater caused siltation, it is proposed to facilitate projects on construction of rainwater harvesting structures for households in the catchment area.

5. Information Education and Communication (IEC) and Capacity Building through Mass Awareness Campaigns

Mass awareness to disseminate the importance of conservation of rivers and to generate a sense of ownership among all sections of the community is the need of the hour. The main focus of Information Education and Communication (IEC) and Capacity Building is behavioural change towards building preservation of river catchment areas, clean environment and overall health and hygiene including use of toilets, safe disposal of wastes, hand washing with soap, safe storage and consumption of safe drinking water.

SUMMARY OF THE ACTION PLAN FOR THE 9 RIVERS FOLLOWS:

TABLE 1 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF TIAU RIVER

Sl. No.	Action Plan	Activities	Estimated Budget				Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan
			System	No. of Households	Rate in Rs.	Amount (in Rs.)		
1.	Municipal waste/sewage management	Setting up of Sewage/Solid waste Management System for Zokhawthar Village	Sewage (Greywater) Management System	200	12400	2480000	2 Years (2019-21)	P.H.E.D
			Solid Waste Management	200	8400	1680000		
			TOTAL (1)			4160000		
		2		Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	No. of towns / villages in the catchment areas		
2	Inventory of Industries and status of effluents generation and disposal mode in the catchment areas.	33	29850		20000	660000	1 st year (Upto 31.03.2020)	
	Regulating industries, existing and newly inventorized in the catchment area in setting up of functional ETP for compliance of effluent standards.	-do-	-do-		15000	495000	2 nd Year (Upto 31.03.2021)	
				TOTAL(2)		1155000		
3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20) Creation : 2 nd Year (2020-21) Maintenance:	E,F & CC Deptt.	
			250 Ha	48770	12192500			

							Next 3 years	
		Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)		Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)
			Run off retarding	43		430000		
			Gully control Scheme	89		1992300		
			Stream bank erosion control	43		1529500		
			Silt Retention Scheme	59		1399980		
			Landslide Control Scheme	4		555780		
			Total of 3(ii)			5907560		
			TOTAL(3)			18100060		
4.	Rain water harvesting/ ground water charging	Rain water harvesting @25% of households for Zokhawthar village	No. of Households to be provided with rainwater harvesting structures	Rate in Rs.		Amount in Rs.	2 Years (2019-21)	P.H.E.D
			125	50000		6250000		
		TOTAL(4)						
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries
			33	5771	20000	660000		
			TOTAL(5)					
G.TOTAL (Total of 1+2+3+4+5)						30325060		

(Rupees three crore three hundred twenty five thousand sixty) only.

TABLE 2 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF TLAWNG RIVER

Sl. No.	Action Plan	Activities	Estimated Cost			Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan	
			System	No. of Households targetted	Rate in Rs.			Amount (in Rs.)
1.	Municipal waste/sewage management	Setting up of Solid waste and Sewage Management System	System	No. of Households targetted	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D
		Lunglei Town	Sewerage Treatment Plant (5 MLD)	30000	57600	172800000		
		Sairang village	Grey Water Management	150	12400	1860000		
			Solid Waste Management	150	8400	1260000		
		Bairabi village	Grey Water Management	150	12400	1860000		
			Solid Waste Management	150	8400	1260000		
						TOTAL (1)		
2	Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	1 st year (Upto 31.03.2020)	M.P.C.B / Commerce & Industries Department
		Inventory of Industries and status of effluents generation and disposal mode in the catchment areas.	2 towns (western part of Aizawl and Eastern part of Lunglei town)	19547	300000	600000		
			91 villages	26005	20000	1820000		
		ii) Regulating industries, existing and newly inventorized in the catchment area in setting up of functional ETP for compliance of effluent standards.	2 towns (western part of Aizawl and Eastern part of Lunglei town)	19547	200000	400000		
			91 villages	26005	15000	1365000		
				TOTAL(2)	4185000			

3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20) b) Creation : 2 nd Year (2020-21) Maintenance: Next 3 years	E,F & CC Deptt.	
			350 ha	48770	17069500			
		Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)	Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)	
			Run off retarding	50	500000			
			Gully control Scheme	98	2220400			
			Stream bank erosion control	56	1572550			
			Silt Retention Scheme	65	1564820			
			Landslide Control Scheme	6	833670			
			Total of 3(ii)		6691440			
TOTAL(3)		23760940						
4.	Rain water harvesting/ ground water charging	Rain water harvesting @25% of households	No. of Households to be provided with rainwater harvesting structures	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D	
		Sairang village	275	50000	13750000			
		Bairabi village	215	50000	10750000			
		TOTAL(4)		24500000				
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	No. of localities and villages in the catchment areas	Total no. of households	Rate (in Rs.)	2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries	
			121	45552	20000			2420000
			TOTAL(5)		2420000			
G.TOTAL (Total of 1+2+3+4+5)					233905940			

(Rupees twenty three crore thirty nine lakh five thousand nine hundred forty) only.

TABLE 3 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF TUIPUI RIVER

Sl. No.	Action Plan	Activities	Estimated Cost			Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan	
			System	No. of Households	Rate in Rs.			Amount (in Rs.)
1.	Municipal waste/sewage management	Setting up of Solid waste and Sewage Management System	System	No. of Households	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D
		Champhai Town	Sewage Treatment Plant (1MLD)	600	57600	34560000		
		Tuipui village	Grey Water Management	101	12400	1252400		
			Solid Waste Management	101	8400	848400		
		TOTAL (1)						
2	Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)		M.P.C.B / Commerce & Industries Department
		Inventory of Industries and status of effluents generation and disposal mode in the catchment areas.	60 (40 villages + 20 localities of Champhai town)	15658	20000	1200000	1 st year (Upto 31.03.2020)	E,F & CC Deptt.
		ii)Regulating industries, existing and newly inventorized units in the catchment area in setting up of functional ETP for compliance of effluent standards.	-do-	-do-	15000	900000	2 nd Year (Upto 31.03.2021)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)
		TOTAL(2)					2100000	

3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20) Creation : 2 nd Year (2020-21) Maintenance: Next 3 years	E,F & CC Deptt.	
			100 ha	48770	4877000			
	Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)	Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)		
		Run off retarding	37	370000				
		Gully control Scheme	75	1457300				
		Stream bank erosion control	28	367750				
		Silt Retention Scheme	44	1129500				
		Landslide Control Scheme	4	555780				
Total of 3(ii)		3880330						
TOTAL(3)		8757330						
4.	Rain water harvesting/ ground water charging	Rain water harvesting @25% of households of Tuipui village	No. of Households	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D	
			25	50000	1250000			
			TOTAL (4)		1250000			
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries
			60	15658	20000	1200000		
			TOTAL (5)		1200000			
G.TOTAL (Total of 1+2+3+4+5)					49968130			

(Rupees four crore ninety nine lakh sixty eight thousand one hundred thirty) only

TABLE 4 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF TUIVAWL RIVER

Sl. No.	Action Plan	Activities	Estimated Cost				Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan
			System	No. of Households targetted	Rate in Rs.	Amount (in Rs.)		
1.	Municipal waste/sewage management	Setting up of Solid waste and Sewage Management System	System	No. of Households targetted	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D
		Saitual Town	Grey Water Management	150	12400	1860000		
			Solid Waste Management	150	8400	1260000		
		Keifang village	Grey Water Management	100	12400	1240000		
			Solid Waste Management	100	8400	840000		
		TOTAL (1)						
2	Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	M.P.C.B / Commerce & Industries Department	
		Inventory of Industries and status of effluents generation and disposal mode in the catchment areas.	25	9340	20000	500000		1 st year (Upto 31.03.2020)
		Regulating industries, existing and newly inventorized in the catchment area in setting up of functional ETP for compliance of effluent standards.	-do-	-do-	15000	375000		2 nd Year (Upto 31.03.2021)
TOTAL(2)					875000			

3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)		Amount (in Rs.)	Advance Work 1 st Year (2019-20) Creation : 2 nd Year (2020-21) Maintenance: Next 3 years	E,F & CC Deptt.	
			100 ha	48770		4877000			
		Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)		Amount (in Rs.)		2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)
			Run off retarding	40		400000			
			Gully control Scheme	81		1651100			
			Stream bank erosion control	37		1202550			
			Silt Retention Scheme	55		1349980			
			Landslide Control Scheme	4		555780			
Total of 3(ii)					5159410				
TOTAL(3)				10036410					
4.	Rain water harvesting/ ground water charging	Rain water harvesting for households of Keifang and Saitual villages	No. of Households targetted	Rate in Rs.		Amount (in Rs.)	2 Years (2019-21)	P.H.E.D	
			200	50000		10000000			
			TOTAL(4)						10000000
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce & Industries	
			25	9340	30000	500000			
			TOTAL(5)						500000
G.TOTAL (Total of 1+2+3+4+5)					26611410				

(Rupees two crore sixty six lakh eleven thousand four hundred ten) only

TABLE 5 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF CHITE STREAM

Sl. No.	Action Plan	Activities	Estimated Cost				Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan
			System	No. of Households	Rate in Rs.	Amount (in Rs.)		
1.	Municipal waste/sewage management	Setting up of Solid waste and Sewage Management System	System				2 Years (2019-21)	P.H.E.D
		Eastern Part of Aizawl City	Sewage Treatment Plant of 3 MLD capacity for 2000 households	5193	57600	115200000		
		Hualngohmun village	Grey Water Management	70	12400	868000		
			Solid Waste Management	70	8400	588000		
		Melriat village	Grey Water Management	100	12400	1240000		
			Solid Waste Management	100	8400	840000		
		TOTAL (1)						
2	Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	Chite stream is the main tributary of Tuirial river and it is within the catchment area of Tuirial river. As this activity is included under action plan of Tuirial river (section 8.9), it is proposed to be undertaken under conservation action plan of Tuirial river.				2 yrs. (2019-21)	M.P.C.B / Commerce & Industries Department
3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20) Creation : 2 nd Year (2020-21) Maintenance: Next 3 years	E,F & CC Deptt.	
			10 ha	48770	487700			

		ii)Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)	Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)
			Run off retarding	-	-		
			Gully control Scheme	36	671400		
			Stream bank erosion control	2	303600		
			Silt Retention Scheme	14	258180		
			Landslide Control Scheme	2	277890		
			Total of 3(ii)		1511070		
			TOTAL(3)		1998770		
4.	Rain water harvesting/ ground water charging	Rain water harvesting @25% of households	No. of Households	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D
		Hualnghmun village	40	50000	2000000		
		Melriat village	77	50000	3850000		
		TOTAL(4)		5850000			
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	Chite stream is the main tributary of Tuirial river and it is within the catchment area of Tuirial river. As this activity is included under action plan of Tuirial river (section 8.9), it is proposed to be undertaken under conservation action plan of Tuirial river.			2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries
G.TOTAL (Total of 1+3+4)					126584770		

(Rupees twelve crore sixty five lakh eighty four thousand seven hundred seventy) only.

TABLE 6 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF MAT RIVER

Sl. No.	Action Plan	Activities	Estimated Cost				Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan
			System	No. of Households	Rate in Rs.	Amount (in Rs.)		
1.	Municipal waste/sewage management	Setting up of Solid waste and Sewage Management System	System	No. of Households	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D
		Serchhip Town (western part)	Sewerage Treatment Plant (2MLD)	1200	57600	69120000		
		Pangzawl village	Grey Water Management	100	12400	1240000		
			Solid Waste Management	100	8400	840000		
		Hnahthial village	Grey Water Management	200	12400	2480000		
			Solid Waste Management	200	8400	1680000		
		TOTAL (1)						
2	Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	M.P.C.B / Commerce & Industries Department	
		Inventory of Industries and status of effluents generation and disposal mode in the catchment areas.	Serchhip (9 localities)	1634	-	200000		1 st year (Upto 31.03.2020)
			24	7479	20000	480000		
		ii) Regulating industries, existing and newly inventorized in the catchment area in setting up of functional ETP for compliance of effluent standards.	Serchhip (9 localities)	1634	-	100000		2 nd Year (Upto 31.03.2021)
			24	7479	15000	360000		
TOTAL(2)					1140000			

3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20) Creation : 2 nd Year (2020-21) Maintenance: Next 3 years	E,F & CC Deptt.	
			100 ha	48770	4877000			
		ii)Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)	Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)	
			Run off retarding	-	-			
			Gully control Scheme	26	586700			
			Stream bank erosion control	13	83450			
			Silt Retention Scheme	27	854100			
			Landslide Control Scheme	4	555780			
Total of 3(ii)			2080030					
TOTAL(3)			6957030					
4.	Rain water harvesting/ ground water charging	Rain water harvesting @25% of households	No. of Households	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D	
		Pangzawl	127	50000	6350000			
		Hnahtial	387	50000	19350000			
		TOTAL(4)			25700000			
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries
			24	7479	20000	480000		
			TOTAL(5)			480000		
G.TOTAL (Total of 1+2+3+4+5)					109637030			

(Rupees ten crore ninety six lakh thirty seven thousand thirty) only

TABLE 7 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF SAIKAH STREAM

Sl. No.	Action Plan	Activities	Estimated Cost				Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan
			System	No. of Households	Rate in Rs.	Amount (in Rs.)		
1.	Municipal waste/sewage management	Setting up of Solid waste and Sewage Management System at Saikah village	Grey Water Management	109	12400	1351600	2 Years (2019-21)	P.H.E.D
			Solid Waste Management	109	8400	915600		
			TOTAL (1)					
		To ensure compliance of effluent standards by industries in the catchment areas.		No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)		
2	Control of Industrial Effluents	Inventory of Industries and status of effluents generation and disposal mode in the catchment areas.	4	518	20000	80000	1 st year (Upto 31.03.2020)	M.P.C.B / Commerce & Industries Department
		ii) Regulating industries, existing and newly inventorized in the catchment area in setting up of functional ETP for compliance of effluent standards.	-do-	-do-	15000	60000	2 nd Year (Upto 31.03.2021)	
		TOTAL(2)				140000		
3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20)	E,F & CC Deptt.	

			30 ha	48770	1463100	Creation : 2 nd Year (2020-21) Maintenance: Next 3 years		
		ii)Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)	Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)	
			1.Run off retarding	30	300000			
			2.Gully control Scheme	52	748100			
			3.Stream bank erosion control	24	622200			
			4.Silt Retention Scheme	39	1025880			
			5.Landslide Control Scheme	4	555780			
			Total of 3(ii)		3251960			
			TOTAL(3)		4715060			
4.	Rain water harvesting/ ground water charging	Rain water harvesting @25% of households	No. of Households	Rate in Rs.	Amount (in Rs.)			
		Saikah village	27	50000	1350000	2 Years (2019-21)	P.H.E.D	
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)		
			4	518	20000	80000	2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries
G.TOTAL (Total of 1+2+3+4+5)					8552260			

(Rupees eighty five lakh fifty two thousand two hundred sixty) only

TABLE 8 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF TUIKUAL STREAM

Sl. No.	Action Plan	Activities	Estimated Amount				Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan
			System	No. of Households	Rate in Rs.	Amount in Rs.		
1.	Municipal waste/sewage management	Setting up of STP for localities in the catchment area.	Sewage Treatment Plant of 2 MLD capacity for 1200 households	1200	57600	69120000	2 Years (2019-21)	P.H.E.D
			TOTAL (1)			69120000		
2	Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	Tuikual stream is one of the tributaries of Tlawng river and it is within the catchment area of Tlawng river. As this activity is included under action plan of Tlawng river (section 8.2), it is proposed to be undertaken under conservation action plan of Tlawng river				2 Years (2019-21)	M.P.C.B / Commerce & Industries Department
3.	River Catchment management	Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20) Creation : 2 nd Year (2020-21) Maintenance: Next 3 years	E,F & CC Deptt.	
			3 ha	48770	243800			
		ii)Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)	Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt.	
			1. Run off retarding		-			
			Gully control Scheme	25	469700			
Stream bank erosion control	17	557880						

			Silt Retention Scheme	20	756480		(LR, S&WC)
			Landslide Control Scheme	4	555780		
			Total of 3(ii)		2339840		
			TOTAL(3)		2583640		
4.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	Tuikual stream is one of the tributaries of Tlawng river and it is within the catchment area of Tlawng river. As this activity is included under action plan of Tlawng river (section 8.2), it is proposed to be undertaken under conservation action plan of Tlawng river			2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries
G.TOTAL (Total of 1+3)					71703640		

(Rupees seven crore seventeen lakh three thousand six hundred forty) only

TABLE 9 : SUMMARY OF THE ACTION PLAN FOR CONSERVATION OF TUIRIAL RIVER

Sl. No.	Action Plan	Activities	Estimated Cost				Time Target for implementation (effective from 01.04.2019)	Department(s) responsible for execution of the Action Plan
			System	No. of Households	Rate in Rs.	Amount (in Rs.)		
1.	Municipal waste/sewage management	Setting up of Solid waste and Sewage Management System for Tuirial village	System				2 Years (2019-21)	P.H.E.D
			Grey Water Management	63	12400	781200		
			Solid Waste Management	63	8400	529200		
		TOTAL (1)			1310400			
2	Control of Industrial Effluents	To ensure compliance of effluent standards by industries in the catchment areas.	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)		M.P.C.B / Commerce & Industries Department
		Inventory of Industries and status of effluents generation and disposal mode in the catchment areas.	Eastern part of Aizawl (30% of settlements)	14400	-	600000	1 st year (Upto 31.03.2020)	E,F & CC Deptt.
			84	30712	20000	1680000		
		ii) Regulating industries, existing and newly inventorized in the catchment area in setting up of functional ETP for compliance of effluent standards.	Eastern part of Aizawl(30% of settlements)	14400	-	450000	2 nd Year (Upto 31.03.2021)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)
			84	30712	15000	1260000		
		TOTAL(2)			3990000			

		Plantation in the catchment area	Area target for regeneration Model: Aided Natural Regeneration	Rate per Ha including Advance Work to 3 yr maintenance (in Rs.)	Amount (in Rs.)	Advance Work 1 st Year (2019-20) Creation : 2 nd Year (2020-21) Maintenance: Next 3 years	E,F & CC Deptt.	
			150 ha	48770	7315500			
3.	River Catchment management	Control of Soil Erosion / Siltation	Scheme	No. of units (Ha)	Amount (in Rs.)	2 Years (2019-21)	Land Resources, Soil & Water Conservation Deptt. (LR, S&WC)	
			Run off retarding	40	400000			
			Gully control Scheme	64	1529400			
			Stream bank erosion control	37	1011700			
			Silt Retention Scheme	49	1479020			
			Landslide Control Scheme	4	555780			
			Total of 3(ii)		4975900			
			TOTAL(3)		12291400			
4.	Rain water harvesting/ ground water charging	Rain water harvesting @25% of households for Tuirial village	No. of Households	Rate in Rs.	Amount (in Rs.)	2 Years (2019-21)	P.H.E.D	
			16	50000	800000			
			TOTAL(4)		800000			
5.	Public participation /Awareness Campaigns	Organize awareness programs for towns/ villages in the catchment area, as part of Department's annual activities	No. of towns / villages in the catchment areas	Total no. of households	Rate (in Rs.)	Amount (in Rs.)	2 Years (2019-21)	L.A.D / P.H.E.D/ LR, S&WC/ E,F&CC/ MPCB/ Commerce& Industries
			110	49689	20000	2200000		
			TOTAL(5)		2200000			
G.TOTAL (Total of 1+2+3+4+5)					20591800			

(Rupees two crore five lakh ninety one thousand eight hundred) only.

**ABSTRACT OF THE FINANCIAL REQUIREMENT FOR IMPLEMENTATION OF THE ACTION PLAN FOR CONSERVATION OF THE
9 (NINE) RIVERS OF MIZORAM**

Sl. No.	Name of River/Stream	Action Plan with Estimated Cost, Time frame and Stakeholder departments									
		Municipal waste/sewage management		Control of Industrial Effluents		River Catchment management		Rain water harvesting	Public participation /Awareness Campaigns	Estimated cost <i>(in Rs.)</i>	Time frame
		<i>STP (in Rs.)</i>	<i>SWM (in Rs.)</i>	<i>Inventory of industries (in Rs.)</i>	<i>Regulation of Industries (in Rs.)</i>	<i>Plantation (in Rs.)</i>	<i>Control of soil erosion /siltation (in Rs.)</i>	<i>Rain water harvesting (in Rs.)</i>	<i>Villages/towns in the catchment area (in Rs.)</i>		
Department entrusted for implementation		Public Health Engineering	Commerce & Industries	Mizoram SPCB	E,F & CC	Soil & Waster Conservation	E,F & CC	All stakeholder Departments			
1.	TIAU RIVER	2480000	1680000	660000	495000	12192500	5907560	6250000	660000	30325060	2 yrs (2019-21)
2.	TLAWNG RIVER	176520000	2520000	2420000	1765000	17069500	6691440	24500000	2420000	233905940	
3.	TUIPUI RIVER	35812400	848400	1200000	900000	4877000	3880330	1250000	1200000	49968130	
4.	TUIVAWL RIVER	3100000	2100000	500000	375000	4877000	5159410	10000000	500000	26611410	
5.	CHITE STREAM	117308000	1428000	-	-	487700	1511070	5850000	-	126584770	
6.	MAT RIVER	72840000	2520000	680000	460000	4877000	2080030	25700000	480000	109637030	
7.	SAIKAH STREAM	1351600	915600	80000	60000	1463100	3251960	1350000	80000	8552260	
8.	TUIKUAL STREAM	69120000	-	-	-	243800	2339840	-	-	71703640	
9.	TUIRIAL RIVER	781200	529200	2280000	1710000	7315500	4975900	800000	2200000	20591800	
SUB TOTAL		479313200	12541200	7820000	5765000	53403100	35797540	75700000	7540000		
GRAND TOTAL										677880040	

(Rupees sixty seven crore seventy eight lakh eighty thousand forty) only