DISTRICT MINERAL FOUNDATION (DMF)

IMPLEMENTATION STATUS AND EMERGING BEST PRACTICES

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DISTRICT MINERAL FOUNDATION (DMF)

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Contents

INTRODUCTION

District Mineral Foundation (DMF) Trusts have been developed across most mining districts in India over the past five years since the amendment of the Mines and Minerals (Development and Regulation) Act (MMDR) in 2015. These district-level bodies have the precise mandate to work in the interest of mining-affected people and areas. This is based on the fundamental idea that local communities have the right to benefit from natural resources extracted from their area.

With the mandated contribution from miners—equivalent to 30 per cent of the royalty amount for leases granted before 2015, and 10 per cent for leases granted after that—the total cumulative accrual in DMFs across the country is close to Rs 36,000 crore as in January 2020. Further, it is estimated that annually Rs 6,000 to Rs 7,000 crore will be accrued to DMF Trusts in the coming years. Given the corpus, DMFs have huge potential for poverty alleviation and improving human development indicators in India's mining areas. As the fund is untied and non-lapsable, it can be used for addressing immediate needs and undertaking long-term improvement of mining-affected communities. DMFs can also strengthen local level governance as local communities have a key role in DMF decision-making, particularly in deciding the use of funds and in monitoring implementation of works and service delivery.

Centre for Science and Environment (CSE) evaluated the trend of DMF implementation in India in the last two years. The DMF status reports of 2017 and 2018 showed that the potential of DMFs in most districts was being undermined due to short-sightedness, poor planning, and ad-hoc investments. Instead of spending on issues that can improve economic and human development indicators of the mining-affected communities and areas, the focus of fund use has been on building physical infrastructure, including roads and bridges. Investments on some high-priority issues such as drinking water supply, education, nutrition, etc. have been too little and too ill-managed.

However, several districts are considering possibilities of course-correction and are re-looking into the scope of DMF fund use. A ground review of some of India's top mining districts shows that projects and schemes are being implemented which are more focused on the needs of mining-affected communities. These include sectors

Chronological overview of DMF

March 2015	DMF instituted under the MMDR Amendment Act, 2015 to work for the 'interest and benefit of people and areas affected by mining related operations'.
September 2015	Pradhan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY) introduced as a guideline for targeted DMF investments. It specified the identification of DMF beneficiaries (mining affected people), directly-affected areas, and sectors for DMF investments.
2015–16	Big mining states Jharkhand, Chhattisgarh, Odisha, Madhya Pradesh, Rajasthan, Telengana, etc. notify their respective state DMF rules.
July 2018	CSE released an in-depth analysis of DMF implementation in India, pointing out massive institutional and administrative deficits as well as the ad hoc nature of investments. Top-down administration and lack of people's participation in DMF planning and decision-making were key concerns highlighted.
September 2018	Odisha amended the state DMF rules to make investments more targeted, making local livelihoods a high priority, and mandating 60 per cent spend on directly mining-affected areas.
January 2019	Ministry of Mines puts up recommendations to improve DMF implementation asking for identification of DMF beneficiaries and engagement of gram sabhas in planning.
August 2019	Chhattisgarh revised its DMF rules making gram sabha members a part of the DMF governing body, asking for identification of DMF beneficiaries, initiating long-term outcome oriented planning, and improving public accountability through social audits.
2015–2019	571 districts across 21 states have set up DMFs so far.

such as livelihood, healthcare, child nutrition, drinking water supply, etc. While many of these projects are currently at a smaller scale, there are considerations of scaling up based on initial learning. Districts are also innovating on how these projects can be rolled out, particularly through partnerships with experts and local non-profit organizations.

This report addresses some of the projects that are being implemented in various mining districts. Based on feedback received from districts where work has substantially progressed, some sector-specific case studies have been selected to demonstrate good practices. The merit of these works has been evaluated in terms of their potential to benefit mining-affected communities and optimal use of local resources to do that. The report also considers some policy reforms undertaken in the recent past to improve DMF implementation, specifically with respect to people's participation in DMF decision-making and improving the focus of investments for mining-affected communities.

While there is a long way to go with respect to proper DMF planning and people's participation, the report does provide an idea of what actually is happening on the ground and what can be done further.

SECTION I

STATUS OF DMF IMPLEMENTATION

A. FINANCIAL TREND

Overall accrual, sanctions and spending

Since 2015, in about five years, DMF Trusts in various districts across the country have a cumulative accrual of close to Rs 36,000 crore.[1]

Non-coal major mineral mining, such as iron ore, bauxite, manganese, limestone, precious metals, etc. account for the highest share of DMF accruals, about 48 per cent. This is largely due to contribution from large iron ore mining districts such as Keonjhar, Sundargarh, West Singhbhum, etc. Keonjhar alone has more than Rs 4,000 crore in its DMF Trust (DMFT), which is nearly one-fourth of the major mineral (non-coal) collection in the entire country. In fact the fund available with Keonjhar district is more than the total accrual of most big mining states (apart from Chhattisgarh and Jharkhand).

The coal and lignite share of DMF funds is also substantial, accounting for about 42.6 per cent of the total accrual. Out of the top five states in terms of DMF accrual, three are coal mining states—Jharkhand, Chhattisgarh, and Telangana.

The contribution of minor minerals to DMF accrual has also increased over the years. Currently the DMF share of minor mineral mining is about ten per cent of the total accrual.

So far, over Rs 30,500 crore have been earmarked for undertaking various developmental projects through DMF funds across all mining districts. These primarily include the provision of drinking water supply, healthcare, sanitation, education, women and child development, livelihood and skill training, and construction of roads. However, the actual amount spent is only slightly over one-third of the allocated amount *(see Figure 1: State-wise accrual, allocation and expenditure in top mining states with more than Rs 100 crore DMF funds).*

Overall investment trend

To understand the trend of investment through DMF funds for various developmental projects, a review of top 13 mining states with substantial allocation has been done *(see Table 1: Trend of sector specific allocations in top mining states).* The analysis shows the following key trends—

- Some states still have a substantial proportion allocated towards physical infrastructure such as roads and bridges. This specifically includes Telangana and Andhra Pradesh where more than 55 per cent of the allocations for physical infrastructure contravenes the PMKKKY mandate.

- Among the high priority sectors, drinking water is the only sector for which allocation has been made in all states. Jharkhand has allotted the highest amount to drinking water supply projects (primarily piped water supply works), which account for nearly 77 per cent of Jharkhand's total allocation. Uttar Pradesh has also allotted a significant amount to drinking water supply works, about 45 per cent of its total allocation.

- Another sector which has started gaining attention is healthcare. In healthcare the highest allocations are in Odisha and Maharashtra, where a big proportion of funds have been allocated for developing major hospitals and medical colleges. In other states, investments in healthcare are focussed on hiring doctors and other medical staff to fill the existing gap in resources.

- In other high priority sectors such as education, women and child development, etc., the focus is primarily on constructing educational facilities and anganwadi centres.

- The investment for income generation, particularly sustainable livelihood, is still at a nascent stage in most districts, though there are some emerging good practices.

Figure 1: State-wise accrual, allocation and expenditure in top mining states with more than Rs 100 crore DMF funds

Total accrual (in Rs cr.) | Total allocated (in Rs cr.) | Total spent (in Rs cr.)

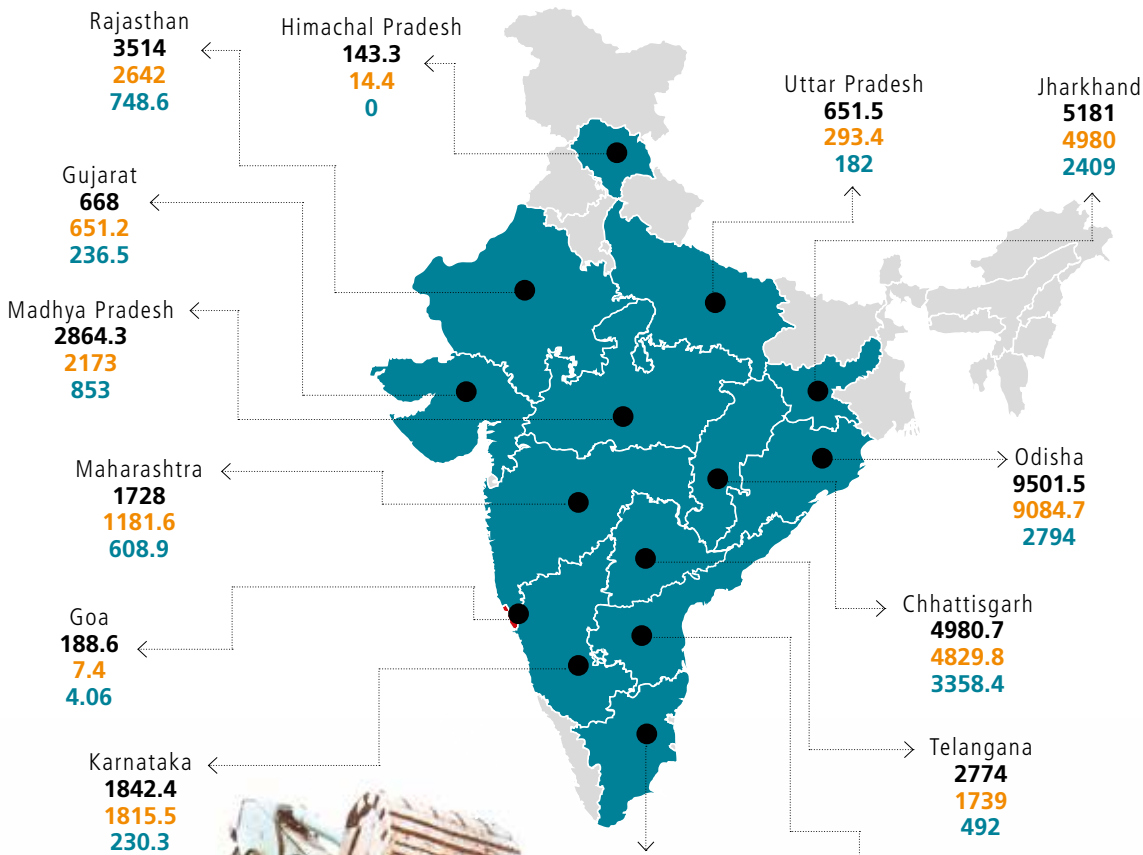

Table 1: Trend of sector-specific allocations in top mining states

	Drinking water (%)	Education (%)	Health-care (%)	Welfare of women and children (%)	Skill Deve-lopment and livelihood (%)	Sanitation (%)	Environ-ment conser-vation (%)	Physical Infras-tructure (%)	Irrigation (%)	Energy and Watershed deve-lopment (%)	Welfare of aged (%)	Housing (%)	Agriculture (%)	Others (%)
Andhra Pradesh	22.2	6.19	2.1	5.4	2.18	2.76	0.04	57.33	0.71	0.11	0.018	0	0	0.73
Chhattisgarh	7.5	24.7	9.2	4	3.2	2.93	2.5	24.57	3.41	4.11	1	0	7	5.01
Goa	100	0	0		0	0	0	0	0	0	0	0	0	0
Gujarat	10	32	9.76	10.6	15.88	2.21	0.67	13.23	1.67	3.95	0.08	0	0	0
Jharkhand	76.7	0	0.5	0	0	11.42	0	0	0	0	0	0	0	11.4
Karnataka	11.7	12.4	14	5.2	4.14	9.6	4.09	27.8	4	3.16	1	0	0	3
Maharashtra	16	6.2	21.5	1	4.2	1.66	2.8	34.8	6.74	3	1	0	0	1.5
Odisha*	30	8.14	10.7	1.62	2.4	0.59	2	34	8.43	1.26	0	0.06	0	0.46
Rajasthan	19.3	23	4.17	1.4	0	0	3.5	47.7	0	0	0	0	0	1
Tamil Nadu	38.8	3.65	3.6	1.34	0.63	1.63	0.32	25.4	20.6	0.93	0.209	0	0	2.9
Telangana	7.61	12	4.15	1.64	7.63	5.9	3.37	55	0.007	0.72	0.6	0	0	1
Uttar Pradesh	45	4	1.7	0.14	0	2.7	2.02	3.3	0.021	9	0.2	0	0	0.7
Madhya Pradesh**	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Odisha records livelihood and road connectivity as separate sectors. They have been included in skill development, and livelihood and physical infrastructure respectively

** Madhya Pradesh did not share the data despite repeated requests

Source: States' mines departments. For Odisha, DMF information was collected from Planing and Convergence department which looks as DMF (As on November 2019)

Snapshot of key DMF districts

DMF funds accrue at the district level and are meant for the benefit of mining affected communities and areas within the boundary of the accruing district. Considering that, this report looks at DMF investments made by some of the topmost districts so far. For this, 17 districts from the the top five mining states have been chosen. These districts comprise the biggest proportion of funds in their respective states, thereby reflecting the overall state trend as well.

JHARKHAND

Jharkhand has a total DMF collection of Rs 5,000 crore so far, about 80 per cent of which comes from the the coal mining districts of Dhanbad, Ramgarh, Chatra, Bokaro and the iron ore mining district of West Singhbhum. Cumulatively, the districts have sanctioned more than Rs 4,000 crore for various works (see *Table 2: DMF accrual and sanction in top five districts of Jharkhand*).

Table 2: DMF accrual and sanction in top five districts of Jharkhand

District	Accrual (in Rs crore)	Sanction (in Rs crore)
Dhanbad	1,335	1,909
West Singhbhum	1,084	857.5
Ramgarh	656.7	902
Chatra	679.5	369.3
Bokaro	492.3	445.3

Note: Sanctions may be higher than the accrual as they include the estimated costs of works to be completed over more than one year.
Source: Mineral resources department, Jharkhand (as on January 2020)

The focus of investment in Jharkhand has been on drinking water and sanitation (construction of toilets to meet Swacch Bharat Mission targets), in line with the state mandate of 2016 which asked for these two sectors to be prioritized. There is a sizeable investments on 'others' which, according to state officials, is primarily for physical infrastructure such as roads, bridges, buildings, etc. (*see Annexure 1 for sector-wise sanctions*). The districts have also started making small investments in other sectors such as education and healthcare.

ODISHA

The topmost state with regard to DMF accrual, Odisha has a cumulative collection of Rs 9,500 crore so far. Most of this comes from five districts—Keonjhar, Sundargarh, Angul, Jharsuguda and Jajpur. Keonjhar has the highest collection in not just the state, but also in the country, of more than Rs 4,000 crore, more than the entire collection of some states. All five districts have made sizeable sanctions for various works through DMF funds (see *Table 3: DMF accrual and sanction in key districts of Odisha*).

Table 3: DMF accrual and sanction in key districts of Odisha

District	Accrual (in Rs crore)	Sanction (in Rs crore)
Keonjhar	4,057	2,516
Sundargarh	2,039	2,768
Angul	1,290	1,178
Jajpur	939.6	1,308
Jharsuguda	693.7	1,141

Source: District office Keonjhar, Sundargarh, Angul, Jajpur and Jharsuguda (as on January 2020)

Some of the biggest investments in the districts are towards drinking water supply, a critical concern in mining-affected areas. The districts have also made large investments in physical infrastructure including big roads and bridges as well as arterial roads in remote locations.

There is an emerging focus on healthcare, education, and livelihoods. While most of the sanctions still remain construction driven, there is a discernible shift towards soft resources, delivery of public services and income enhancement (*see Annexure 3 for sector-wise sanctions*).

CHHATTISGARH

DMF collection in Chhattisgarh is currently close to Rs 5,000 crore. The key mining districts in the state include the coal districts of Korba and Raigarh, and the iron ore mining district of Dantewada. The districts have made varied investments through DMF, with Korba so far making the highest sanctions of more than Rs 1,000 crore (see *Table 4: DMF accrual and sanction in key districts of Chhattisgarh).*

Table 4: DMF accrual and sanction in key districts of Chhattisgarh

District	Accrual (in Rs crore)	Sanction (in Rs crore)
Korba	1,118	1,087
Raigarh	283	195.2
Dantewada	486	616

Source: District DMF office of Korba, Raigarh, and Dantewada (as on January 2020)

The biggest investment in districts is on physical infrastructure. Other key sectors with sizeable investments are education, drinking water and healthcare (*see Annexure 2 for sector-wise sanctions*).

MADHYA PRADESH

Madhya Pradesh has a total DMF collection of Rs 2,800 crore, most of which comes from its coal mining district Singrauli. The district alone accounts for about 65 per cent of the state collection with a DMF accrual of more than Rs 1,800 crore so far.

Singrauli, the biggest coal district of MP, has sanctioned about Rs 693 crore so far. The predominant sanction is for physical infrastructure which includes big roads and bridges (*see Annexure 4 for sector-wise sanctions*). Singrauli has started small, pilot investments on livelihood which, however, are still in their nascent stages. Anuppur has the second highest DMF collection in MP. The coal district has sanctioned close to Rs 147 crore, a big share of which is for physical infrastructure. Other key sectors are healthcare and education.

Table 5: DMF accrual and sanction in key districts of Madhya Pradesh

District	Accrual (in Rs crore)	Sanction (in Rs crore)
Singrauli	1,880	693
Anuppur	183.2	147.7

Source: Singrauli and Anuppur district office (as on January 2020)

RAJASTHAN

The two topmost districts in terms of DMF accrual are Bhilwara, with a collection of about Rs 1,200 crore so far, and Rajsamand, with around Rs 795 crore (see *Table 6: DMF accrual and sanction in key districts of Rajsthan*).

The biggest focus of investments in the two districts is on physical infrastructure, followed by education and drinking water supply. As per officials, the investments are focussed on construction works across sectors (*see Annexure 5 for sector-wise sanctions*). Rajasthan DMF rules also consider rehabilitative aid to silicosis patients as a high priority issue for investment. The districts have gradually started disbursing DMF funds for direct benefit transfers to silicosis patients and their families.

Table 6: DMF accrual and sanction in key districts of Rajsthan

District	Accrual (in Rs crore)	Sanction (in Rs crore)
Bhilwara	1,200	780
Rajsamand	795	640.7

Source: Office of mining engineer, Bhilwara and Rajsamand (as on January 2020)

B. STATUS OF KEY INSTITUTIONAL AND ADMINISTRATIVE OBLIGATIONS OF DMF

DMFTs have some crucial obligations, which are also fundamental to the people-centric vision of the MMDR Amendment Act, 2015. A review of the 13 key states shows that many of the obligations remain unfulfilled.

1. **DMF administration remains dominated by district officials and MLAs and MPs.** In Jharkhand, panchayati raj institution (PRI) members are part of DMF body, but they too are elected representatives. Barring Chhattisgarh, where recent rule amendments include Gram Sabha members from mining-affected areas, there is no representation of general Gram Sabha members or local communities in the DMFT decision-making body anywhere.

2. **No district has identified the DMF beneficiaries (mining-affected people).** Since DMFT is a non-profit trust, it it is obligated to identify and notify its beneficiaries. Many districts have identified directly-affected areas and consider people falling within the area as the beneficiaries. No identification has been done to include displaced people, people whose livelihoods were affected due to mining, people who might need any special and direct assistance, etc., despite a clear mandate in states' rules and the PMKKKY.

3. **Identification of directly-affected areas is arbitrary.** No proper mapping has been done for demarcation and delineation of mining-affected area. For instance, in Odisha, as per state rules, all districts have taken a radius of 10 kilometres from mine lease areas as directly-affected, even as demographics, land use patterns, and density of population widely differs between districts; Rajasthan is considering the entire district as directly-affected. There is no methodical approach to determine this.

4. **No long-term planning has been done for DMFs.** Many state rules specify that DMFs undertake a planning exercise to identify the works and projects. Odisha and MP state DMF Rules, for instance, ask for a perspective plan; Chhattisgarh Rules ask for a mid to long term DMF plan. However, no districts have prepared DMF plans so far making investments ad hoc.

5. **DMF public accountability mechanisms are weak.** Auditing—both financial and performance audits—are a key tool to ensure accountability of any public institution. No social or performance audit of DMFs has been done to scrutinize the effectiveness of DMF functioning and implementation of works. Chhattisgarh and Maharashtra mandate social audit for DMFs, but no district has conducted one. Others states do not even have such provisions.

6. **DMF information in public domain in limited.** All DMFs have a 'compliance for transparency mandate' as per PMKKKY and state rules. It is specified that all DMFTs have a website providing clearly the composition of DMF bodies, list of mining-affected areas and people, DMF plan, budget, sanction and progress of works, meeting minutes and action reports, details of problems in implementing, etc. Currently, barring Ramgarh (Jharkhand) and Keonjhar (Odisha), no other district's DMF information is available in public domain. There are state and district DMF portals, but they lie defunct. Even the Ministry of Mines (MoM) national portal provides only basic details of state-wide accruals and sanctions.

SECTION II

EMERGING BEST PRACTICES

CASE STUDIES FROM DISTRICTS

Lack of planning and ad-hoc investments have been some of the biggest drawbacks of DMFs in almost all districts since the time they came into effect. Due to this, DMFs have largely became indistinguishable from any other general development fund as the most pressing needs of mining-affected communities were not prioritized.

For instance, in the first three years of its implementation, building roads and bridges with DMF funds has been one of the biggest focus of many top mining districts in various states. This is despite the fact that spending on such physical infrastructure has been red-flagged under the PMKKKY guidelines and the state DMF rules place it outside the purview of 'high priority' issues. Further, high priority sectors which could improve human development indicators and positively impact the well-being of mining-affected communities, did not receive enough and much needed investments through DMFs in most districts.

A point in case is livelihood and income generation. In all mining districts, particularly in the rural areas, there are high levels of poverty and income insecurity. Government data shows that in 85 to 90 per cent of households in these areas the highest earning member earns less than Rs 5,000 per month. At the same time, there is a high level of unemployment among people of working age group. Even among the working population, a very high proportion are marginal workers. Despite this, focus on livelihoods has been limited, to the extent that states such as Jharkhand have made no sanction towards this. In other states, the sanctions have been negligible and limited only to construction of skill development centres and training, often leaving out enhancement of local skills and utilization of available natural resources for creating livelihood opportunities and improving people's incomes.

Another example is sanctions towards women and child development. While most mining districts have high under five mortality rate (U5MR) and severe symptoms of malnutrition, particularly among children below five years of age, they earmarked less than one per cent of the total DMF sanctions for this pressing issue. The small sanctions also focus largely on construction, and seldom on improving nutrition through supplementing and improving diets, access to better food and health services, etc. This is the case for all the top DMF districts in Odisha, Jharkhand, Chhattisgarh, Madhya Pradesh, Rajasthan, etc.

However, these challenges are slowly being recognized by districts and their respective state governments. While a structured planning process is yet to take-off for DMFs, some districts have started emphasizing high-priority sectors through innovative and targeted approaches. While many initiatives are still at an early stage of implementation and thus their long-term impacts are still to be accrued, the possibility of change is encouraging.

This section captures some the best practices in various high priority sectors as specified under the PMKKKY guidelines and the state DMF rules. At times, investments in some of these sectors are also cross-cutting. The works highlighted have been selected based on details and feedback obtained from the mining districts following a survey. These works are as documented until December 2019.

DRINKING WATER SUPPLY

Due to high pollution caused by mining and related industrial activities, availability of clean drinking water is a major challenge in all mining districts. In most cases, vital surface water bodies such as rivers are highly polluted. Ground water is equally polluted due to water discharge from mines and leaching. Depleting groundwater table due to unbridled industrial as well as personal extraction compounds the problem further.

Hence, many districts have allocated DMF funds for drinking water in varied proportions. The type of work undertaken to fix the problem of drinking water supply is also varied. Districts are looking at various approaches form piped water supply schemes to more short-term solutions like installation of hand pumps and tube-wells.

While the focus on drinking water supply is welcome, there are outstanding questions with respect to the effectiveness and viability of many of the projects sanctioned so far. For instance, as per a CSE assessment until May 2018, the state of Jharkhand had sanctioned about Rs 1,433 crore for piped water supply projects, which accounted for more than 82 per cent of the overall state sanction through DMF. Out of the total sanction for drinking water projects, Rs 856 crore accounted for 19 piped-water schemes in Dhanbad district alone. However, a majority of them are rural water supply projects which were initially conceived under the government's rural drinking water scheme but were not implemented earlier. There was no need-based investment prioritizing directly-affected areas, which was evident from the fact that the biggest mining-affected area, Jharia, did not receive any sanctions. In other cases, many mining districts in various states had focused on hand pumps, even though the quality and availability of ground water is questionable in those areas.[2]

There are, however, some investments which are focused on providing clean drinking water to communities in mining-affected areas and are looking at projects which ensure both treatment of water as well as long-term supply. At the time of this review, it is difficult to gauge the outcome of many of these projects, particularly of piped water supply, because several of them are yet to start and most others will only be completed in the coming years.

The projects highlighted in this section are the ones which have already been rolled out and reached the beneficiaries, or are close to completion and being operational. The projects are from two key mining districts which have also made a sizeable, more than 50 per cent of total DMF, investment on drinking water supply.

◀◀ PHOTO CREDIT: RAJEEV RANJAN / CSE

Clean drinking water through piped supply and solar power

RAMGARH, JHARKHAND

- **Rs 687 crore** DMF funds sanctioned for drinking water
- **22%** Households in Ramgarh with access to treated tap water
- **93%** Public schools in Ramgarh lacking drinking water facility

Lack of treated drinking water is a major concern in Ramgarh's mining-affected areas. Most households in the district rely heavily on untreated groundwater sourced through hand pumps or uncovered wells.[3] There is also dearth of treated tap water within the premises of most anganwadis (AWCs), schools across all levels, and primary health care facilities.[4]

Considering the situation and following state government directions, the district has earmarked 77 per cent (Rs 687 crore) of its total Rs 902 crore DMF sanctions for drinking water projects. These include both piped water supply and mini solar-based water supply projects, amounting to 94 per cent and five per cent of the sanctions for drinking water respectively. The remaining one per cent is largely for various maintenance and renovation works.[5] The solar-based water supply projects are to address the immediate water needs, while the piped water supply are a long-term investment.

MINI SOLAR-BASED WATER SUPPLY PROJECTS

- **Number of projects:** 496
- **Investment:** Rs 26.7 crore
- **Location:** Across the district; focus on hamlets (tolas), and public middle and high schools in mining-affected areas

The mini solar-based water supply projects were the first set of drinking water works taken up in 2017 in Ramgarh to address the immediate water needs. They have been set-up across the district in both directly and indirectly mining-affected areas, but specially to target smaller hamlets (*tolas*) and settlements of primitive tribal groups (*birhor tolas*). They are also augmenting water supply to government-run middle and high schools in the district's mining-affected areas.

There are two types of solar-based water supply projects. One where bore-wells already exist and others where new bore-wells have to be dug up. (see *Table 7: Investments in mini solar-based water supply projects in Ramgarh district*).

For existing bore-wells, a solar submersible pump is fitted along with the existing hand pump which gives an average yield of 1,500–2,000 litres/hour. Water pumped by the system is stored in elevated tanks with a capacity of 4,000 litres. There are four taps fitted to each of these water structures for drawing water. On an average 25 to 30 households (one tola) draw water from each of these.

Table 7: Investments in mini solar-based water supply projects in Ramgarh district

Work type	Coverage areas	No. of works	Sanction (Rs crore)
Solar-based mini rural water supply project with existing source	Tolas	134	6.14
Solar-based mini rural water supply project with existing source	Middle schools/ high schools	175	8.01
Solar-based mini rural water supply project with development of high yield drilled tubewells (HYDT) and hand pumps	Tolas	145	9.78
Solar-based mini rural water supply project with HYDT Including IM II hand pump in different Middle/High Schools	Middle schools/ high schools	42	2.80

In Balkudra more than three solar-based water projects have been installed in three different tolas, covering a population of nearly 5,000 people. People of Balkudra panchayat say the solar-based mini water supply projects have been helpful in addressing the immediate water needs of the tolas.

Traditionally, they were using wells and hand pumps. However, water from wells was visibly yellow and looked contaminated. Most handpumps would run dry during the summer. For the villages, water is available round the year after solar-based mini water supply was installed. Vijay Munda, who lives beside the water tank said, 'they have been using the water from the tank for drinking. The quality of water from solar-based mini supply is better compared to wells and hand pumps'.

According to the mukhiya of Pundi panchayat in Ramgarh's Mandu area, the installations at schools have helped children avail water for both drinking purposes and general hygiene. It is also used for cooking mid-day-meals (MDM).

MRAR-SEWTA WATER SUPPLY PROJECT

- **Investment:** Rs 20.2 crore
- **Location:** Mining-affected panchayats of Mandu and Ramgarh blocks
- **Estimated households to benefit:** 4,431
- **Feature:** Damodar river as source, treatment before supply

Ramgarh district sanctioned about Rs 650 crore for 26 piped water supply projects as of October 2019. While most of these works are under construction and are expected to be completed in the next two years, the Mrar-Sewta piped water supply project is already functional.

The project relies on Damodar river as a source of water and covers three panchayats in mining affected areas—Sewta panchayat in Mandu block, and Mrar and Sandi panchayats in Ramgarh block. Currently, a total of 2,500 households in these panchayats have already been connected under this scheme. It is estimated to cover about 4,431 households in the region.[6]

This is one of the smaller projects with an estimated cost of about Rs 20.2 crore. This includes the cost for a 60 kilometre pipeline distribution system, a 3.8 million litres per day (MLD) capacity water treatment plant, household connections and operation and maintenance cost for the next five years and miscellaneous expenses such as labour payments, cost of approach road, staff quarters, etc. (see *Table 8: Fund outlay of Mrar-Sewta piped water supply project*).

Table 8: Fund outlay of Mrar-Sewta piped water supply project

Expenditure heads and details	Amount (in Rs lakh)
Pipeline distribution system (60.1 km. approximately)	831.1
Elevated service reservoir with a capacity of 675 KL	85.6
Raw water rising main	130.6
Water treatment plant (3.8 MLD conventional)	135.4
Intake well with pump house	25.7
RCC gangway—150x3 m	41.4
E&M at Intake well	38.8
E&M at WTP	40.7
Clear water rising main	118.6
Boundary wall	27.9
Approach road	22.9
RCC pillar	6.4
Staff quarters	11.3
Labour and administrative expenditures	53.9
Operations and maintenance cost for five years	325.9
Household connections (4431 approximately)	125.1
Total	**2021.3**

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Neelam Devi, who lives in Mrar panchayat considers piped water supply to be a huge time-saver for her and other women in the area. 'Earlier, we used to draw water from a hand pump which was some distance away but now water is available at our doorstep,' she says. Beneficiaries said that water is supplied to households every morning for one to two hours.

The villagers, particularly women, feel that clean water will help reduce their health problems. Meena Devi, a resident of Sewta panchayat, said the water that they used to fetch from hand pumps earlier was of poor quality. Their children would suffer frequently from stomach ailments. 'We now use the treated water for both drinking and cooking purposes and can feel the difference,' she said.

In Sandi, about 600 of the 750 households have piped water connection. It relieves them from low water availability during summer, apart from supplying clean water. Ram Sahay Bediya, from Tilaiya village said, 'When the hand pumps ran dry in summers, the municipality would provide a tanker which would be irregular and insufficient to meet requirements. People queued up in large numbers for water. With the piped water, supply has been regular over the last four months. People are satisfied with this project as water has been available on a daily basis for the last four months'.

SONEBHADRA, UTTAR PRADESH

- **Rs 96 crore** Funds sanctioned for drinking water
- **13%** Households in Sonebhadra having access to treated tap water
- **35** Villages in mining area of Myorpur with excess fluoride in water

Dotted with coal mines and thermal power plants, clean drinking water has remained a major challenge in Uttar Pradesh's Sonebhadra district. The Central Ground Water Board (CGWB) had marked ground water pollution as semi-critical in certain parts of the district, particularly the Myorpur block where high levels of fluoride (up to 8 ppm)[7] were found in ground water in 35 villages. It was much higher than the permissible limit of 1–1.5 ppm.[8] All six coal mines in the district are located in Myorpur.

The National Green Tribunal (NGT) had also repeatedly taken note of the high pollution in both surface water and ground water. A 2015 Central Pollution Control Board (CPCB) report submitted to the NGT on pollution in Sonebhadra-Singrauli mining and industrial area said that there are serious lapses in disposal and management of fly ash in the area which is polluting the Rihand reservoir, a major source of surface water in the region.[9] The report further mentions that the reservoir is also contaminated by run-off and discharge from Northern Colafield Limited's (NCL) coal mining projects in the area. The poor water quality, particularly high in fluoride and mercury content, has contributed to serious health problems such as dental caries, bending of bones, and blindness.[10] Both the NGT and the CPCB had directed that households in the region should be supplied with treated water.

PIPED WATER SUPPLY PROJECTS

- **Total projects:** 2
- **Investment:** Rs 88.7 crore
- **Location:** Kuldomari, Auri and Anpara GPs of Myorpur
- **Features:** Sourced from cooling water of local thermal power plant; water treatment before supply

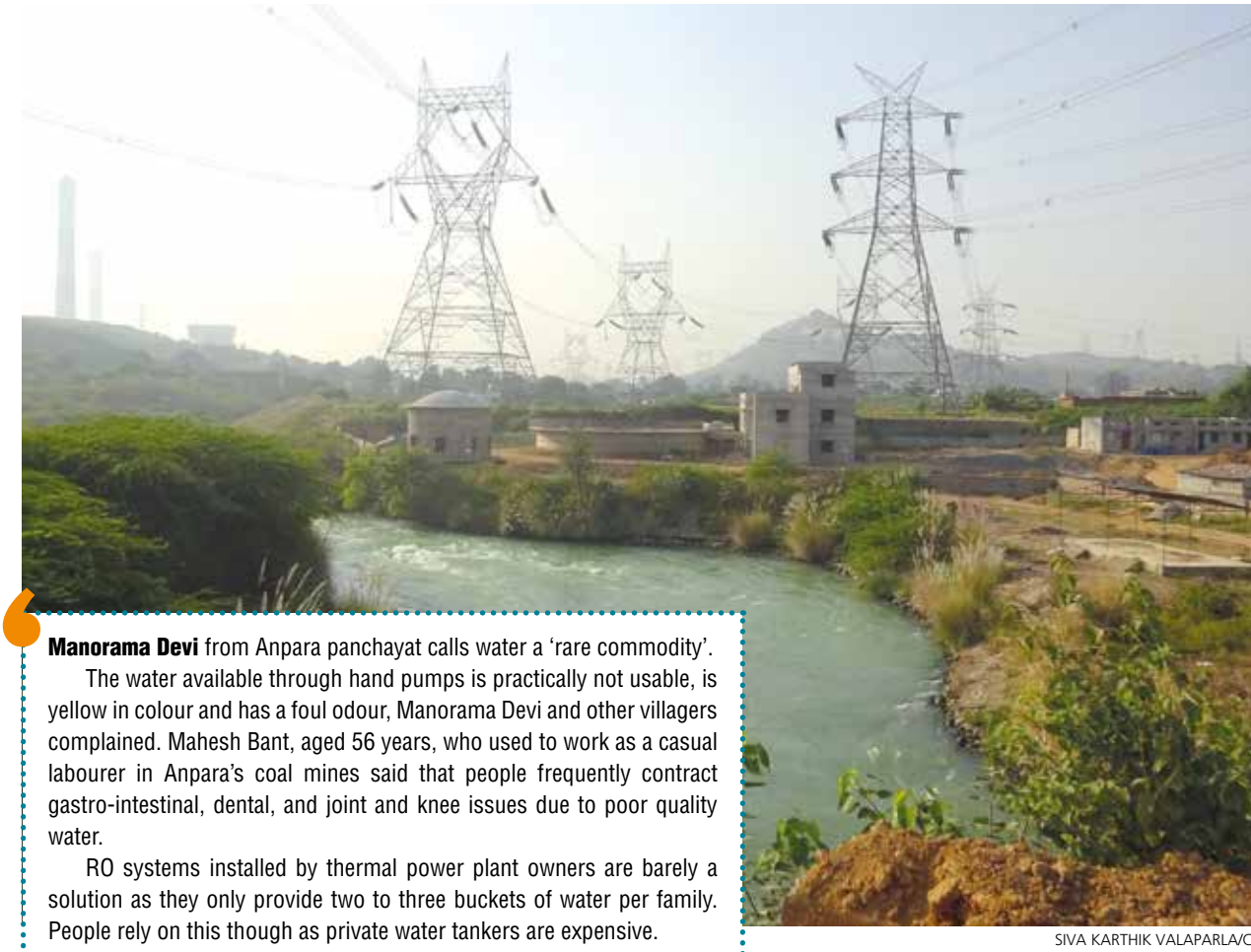
Sonebhadra has sanctioned about Rs 189 crore so far for various developmental works, out of which nearly Rs 96 crore (more than 50%) is for clean drinking water supply.

There are two piped drinking water supply projects through DMF undertaken in Myorpur. One project, costing about Rs 47.6 crore, is targeted to cover 32 habitations of Kuldomari gram panchayat. The other project, costing about Rs 41.1 crore, is targeted at all villages and wards of Auri and Anpara gram panchayat. The work on the water supply started in January 2019 and

is expected to be completed by 2021. Once completed, it will cover a total of 10,185 households in the panchayats.[11]

The source of the water is the cooling water disposed from the condenser of the Anpara thermal power plant. The water will be treated through two water treatment plants—capacity of 7 MLD and 8 MLD—before being distributed to the households through a network of pipelines. The combined distribution network of pipelines is about 200 kilometres, of which 103 km is already completed as on November 2019.

The water project has been designed for supply for the coming 30 years, providing 80.5 litres of water per person per day. In the initial phase, the water supply will be free of user fee and the maintenance cost for the first year will be borne by the contractor. After that, the DMFT will decide on whether to hand over the project to panchayats or to the water department.



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Manorama Devi from Anpara panchayat calls water a 'rare commodity'.

The water available through hand pumps is practically not usable, is yellow in colour and has a foul odour, Manorama Devi and other villagers complained. Mahesh Bant, aged 56 years, who used to work as a casual labourer in Anpara's coal mines said that people frequently contract gastro-intestinal, dental, and joint and knee issues due to poor quality water.

RO systems installed by thermal power plant owners are barely a solution as they only provide two to three buckets of water per family. People rely on this though as private water tankers are expensive.

The community is hopeful that their water woes will be addressed through the project. In Kuldomari panchayat, fluorosis is a big concern. Due to poor quality and contamination of water, children and adults suffer from it alike. Locals feel that clean water supply will not only save them the trouble of walking long distances to fetch water, but also reduce the incidence of fluorosis.

NUTRITION AND CHILD DEVELOPMENT

The status of support for child nutrition is poor in various rural and tribal areas of India. The mining districts are no exception to this. They are burdened with high U5MR and various other symptoms of malnutrition such as stunting, wasting, etc.

In the first years of DMFT investments, the issue of women and child development barely received attention. An overall national review showed that most districts failed to make necessary investments to improve nutrition outcomes among children, even when DMF provides an opportunity to improve upon and go beyond the existing nutrition schemes. In cases where districts made small sanctions, they were for construction of AWCs, rather than for addressing key resource gaps or considering strategic intervention.

However, over the last one year, some districts have started to make more premeditated investments to address the issue of child nutrition. These investments have been rolled out on a pilot basis and are now gradually being scaled up. They are significant as a beginning and can be used by other districts as opportunities for learning.

The first three years of a child's life are critical for its development and long-term health. However, there is scarcely any attention paid towards nutrition during these formative years, until the child joins an AWC at the age of three years. The existing women and child welfare programmes, such as the Integrated Child Development Services (ICDS), fail to achieve comprehensive outreach to children under the age of three, especially in extremely resource-poor areas.

The intervention for improving nutrition in the first three years of a child's life is much needed and thus laudable. This section highlights two such interventions through DMFT in two important mining districts—Keonjhar district of Odisha and Annupur district of Madhya Pradesh.

◀◀ PHOTO CREDIT: CHINMAYI SHALYA/CSE

Investing to improve early childhood development

KEONJHAR, ODISHA

- **Rs 13 crore** DMF funds sanctioned for women and child development
- **44%** Children under 5 years who are stunted and underweight
- **70** U5MR in rural areas

Primarily a rural district with a high percentage of tribal population (more than 45 per cent), Keonjhar has poor malnutrition indicators. The district has a U5MR of as high as 70 in rural areas.[12] Forty-four per cent of children below the age of five years are stunted and underweight while nearly 32.7 per cent of children between the ages of six and 59 months are anaemic.[13]

The district is using some of its DMF funds by setting up crèches to address the nutritional needs of children under three years of age. This is besides the regular ICDS program. As a start, the crèches have been set up in the mining-affected blocks of the district.

CRÈCHES FOR CHILDREN UNDER THREE YEARS

- **Total number of crèches:** 60
- **Location:** Joda, Banspal and Harichandanpur
- **Features:** Focused intervention for nutrition, involvement of local community, implementation through NGO partner

Keonjhar is the first district to invest in crèches for children under three years of age through DMFT to improve child development. To run the créches, the district signed an MoU with non-profit organisation Ekjut, which has prior experience of working on child nutrition in rural and tribal parts of Jharkhand and Odisha. After an initial pilot with 30 creches, Keonjhar now has a total of 60 creches across mining-affected areas of Joda (29), Banspal (20) and Harichandanpur (11).

Créches are set up at the village level. Each crèche on an average supports 20 children. There are typically two care-givers per crèche, who are women selected from the local community, to provide children a home-like atmosphere. There is one project monitor per 10 crèches and one manager per 30 crèches who are from Ekjut staff. The district has mandated a monthly report submission on the development and requirements of the crèches, and there are periodic review meetings conducted by the district collector's office.

Table 9: One year fund outlay for 30 crèches in Keonjhar district

Expenditure heads	Cost (in Rs)
One time establishment cost	19,84,592
Operational cost	46,08,644
Staff salary	45,14,076
Training of staff	1,33,402
Clothes and food	8,13,645

The total operational cost of 60 creches currently is about Rs 2.5 crore annually. This includes one-time set-up cost and other recurring expenses such as salaries, food, clothing, etc. (see *Table 9: One year outlay for 30 créches in Keonjhar district*). The crèches create an opportunity for multi-strategy intervention for nutrition. About 70 per cent of the child's nutritional requirements are provided through the crèche diet. The crèches are often accompanied with kitchen gardens which grow vegetables to support the crèche diet. They also inculcate hygiene habits, early childhood stimulation, and do growth monitoring and health referral.

The aim is also to create a sense of community ownership for the services, says Shibanand Rath of Ekjut. From selecting the appropriate site to setting up a crèche and identifying the crèche workers to monthly meetings on health and nutrition issues, the NGO constantly engages with the local community, says Rath.

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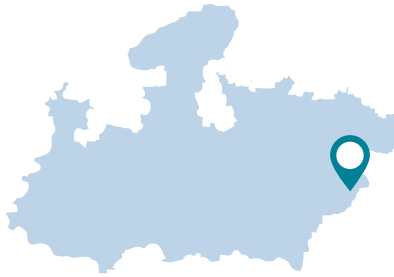
Crèches are seen as an important intervention for children who are not old enough to go to the AWC centres. Most locals said they were initially sceptical about the value of crèches for their children's lives. However, after a few months, they felt their children were indeed benefitting from the crèches.

Crèches have also been of help in cases where both parents go to work. In Talkainsari village of Banspal block, Basanti Mahto and her husband leave their one-year-old daughter at the local crèche when they go to work. Basanti is a farm labourer and her husband a mason. The biggest trust builder for Basanti is the fact that her child is looked after by women of her own village. 'She also gets good food to eat and I feel she is healthier now,' said Basanti. Another woman in the village said that while she stays at home, she prefers to send her son to the crèche as he not only gets good food but is also learning names of colours, vegetables, flowers, etc.

The concern that stands out for observers is that since the crèches are entirely private run through Ekjut, scaling them up to address the issue of nutrition on a bigger scale, for the entire district, might pose challenges of expansion as well as of monitoring.

ANUPPUR, MADHYA PRADESH



- **Rs 8.5 crore** DFM fund sanctioned for women and child development
- **33.5%** Proportion of children under 5 years who are stunted
- **40%** Proportion of children under 5 years who are underweight

Anuppur has a high proportion of malnourished children. Nearly 33.5 per cent of children below the age of five years are stunted and nearly 40 per cent within this age group are underweight.[14] The proportions are about three to four per cent higher in rural and tribal areas. Moreover, in rural areas more than 68 per cent children aged between six to 59 months are anaemic. To address this, the district is using DMF for phulwari centres for children under three years of age.

PHULWARIS FOR EARLY CHILDHOOD NUTRITION

- **Total number of phulwaris:** 75
- **Annual expenditure per phulwari:** About Rs 1 lakh
- **Location:** Pushparajgarh block
- **Features:** Involvement of local women, implementation through NGO partner

Anuppur has tied up with Jan Swasthya Sahyog (JSS) to establish phulwari centres for children under three years of age. JSS has over 15 years of experience in running phulwari centres in states like Chhattisgarh and also assists the district administration in effective implementation of National Health Mission (NHM). The agreement is to provide technical support in running the phulwaris for three years after which they will be handed over to the community for management. Phulwaris have been set up in Pushparajgarh block. In strict terms, Pushparajgarh falls in the indirectly mining-affected area, but considering that the block has about 78 per cent tribal population and higher than average proportion of malnourished children[15], the district has chosen it as the first point of intervention to roll out the project.

Table 10: Fund outlay for each phulwari in Anuppur district

Expenditure heads	Cost (Rs)
One time establishment cost	10,900
Food and nutritional support	50,220
Staff salary	42,180
Rent	4,800

Currently there are 75 phulwaris running in the block, each having not more than 15 children. The annual operation cost of each phulwari is about Rs 1 lakh (see *Table 10: Fund outlay for each phulwari in Anuppur dustrict*). There is typically one caregiver (phulwari worker) per 10 children in the phulwaris, who are women from the same village. They take care of the daily tasks such as cooking for children and feeding them, taking care of the hygiene, conducting games, etc.

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Besides this, there are phulwari supervisors who keep a check on the attendance of the caregivers and their work, ensure timely supply of every consumable used in the phulwari, conduct home visits when required, conduct meetings with parents and community members on issues of nutrition and health, among other things.

Presently, there are five supervisors working in the block. At the district level there is a phulwari co-ordinator who monitors the plan made by supervisors and helps in troubleshooting problems that the supervisors are not able to handle themselves. Above the phulwari coordinator is the project coordinator who looks after the overall management and implementation of the program along with other elements of the National Health Mission.

The project coordinator also facilitates the training and capacity building of phulwari supervisors and phulwari workers. The logistics and finance manager looks after all financial transactions related to DMF. The salaries of supervisors, phulwari co-ordinators, project co-ordinators and the finance managers are borne out of NHM budgetary outlay. The setting up and running cost of phulwari comes through DMF.

These phulwaris run at a very low cost primarily because of low infrastructure and overhead cost. Those with less than ten children are operating from the houses of the phulwari workers. If the numbers are higher or there is no space at the worker's house, places like panchayat bhawans or any other community buildings are used against a small rental charge as required.

The phulwaris are perceived as a support for the community. For instance, they allow mothers to go out to work without worrying about their children's safety. Chameli Devi, mother of an 18-month-old girl says that, 'earlier it was difficult to go to work leaving the child behind at home. Now I can leave my child at the centre and go to work in the field without any worry'. Similarly, the elder siblings of the child can also go to school instead of having to stay back home to look after the child.

Kalawati, a phulwari karyakarta at Sarayi village, explained how it was difficult initially to convince the parents to send their children to the centres, but gradually with the help of phulwari co-ordinators, community confidence improved.

Savita Singh, chairperson of Narmada Ajeevika Swayam Sahayata Samooh, a local self-help group (SHG), feels outreach about the importance of phulwaris has to be scaled up through various platforms. 'We discuss regularly at our SHG meeting and try to persuade mothers to send their children to phulwaris. It succeeds to some extent, but there still are parents who won't send their children as they do not understand the merits of it,' Savita said. She hopes this will gradually change.

HEALTHCARE

Delivery of healthcare services is one of the critical challenges faced by mining-affected areas across the country. The problem is multi-pronged. While there is a dearth of adequate infrastructure, there is also an acute shortage of resources such as necessary equipment, health staff and even doctors to run existing public health facilities. The situation needs reprieve at all levels, from primary health care in rural areas to the district hospitals.

In India, most of the villages (about 87 per cent) do not have a primary health centre (PHC) within a radius of five kilometres.[16] The situation is equally dire or worse in some of the biggest mining districts. For instance, in West Singhbhum (Jharkhand), PHC access within five kilometres is available to only about 14 per cent of villages. Only 36 per cent of villages in the district have a Community Health Centre (CHC), a facility that provides secondary level of healthcare, within the 10 kilometre radius.[17]

The existing facilities are grossly short on staff making many of them redundant for the people. Figures taken in 2018 show that in Keonjhar district, there is an average shortfall of 40 per cent doctors in CHCs and district hospital.[18] Since, income levels among most people in rural mining areas are low, private healthcare is often a financially strenuous option.

Evidently, healthcare is one of the high priority areas for investment under DMF as per PMKKKY and DMF rules of all the states. Increasingly, the districts are also focusing on this sector. Some districts have hired qualified doctors through DMF, while others are trying to address primary healthcare in remote areas. In some, state level interventions for direct benefit transfer have been considered.

This section highlights some such examples from mining districts of Chhattisgarh, Odisha, Jharkhand and Rajasthan.

◀◀ PHOTO CREDIT: PRASHANTH CHINNAPPANAVAR /CSE

Hiring doctors to reduce health staff deficits

BIJAPUR, CHHATTISGARH; KEONJHAR AND SUNDARGARH, ODISHA; WEST SINGHBHUM, JHARKHAND

- **Rs 437 crore** DMF funds sanctioned for healthcare in Keonjhar
- **Rs 34.8 crore** DMF funds sanctioned for healthcare in Bijapur
- **Rs 153 crore** DMF funds sanctioned for healthcare in Sundargarh
- **43%** Deficit of doctors in district and sub divisional hospital in Keonjhar
- **43%** Deficit of doctors at CHC in Sundargarh
- **55%** Deficit at district hospital in West Singhbhum

One of the biggest challenges for rural healthcare is adequate medical staff, particularly doctors. Most mining districts face a critical shortage of doctors and specialists at not only community health centres (CHCs) located at the block level, but also at district hospitals. For instance, in Sundargarh district, there is a 43 per cent shortfall of doctors at CHCs.[20] The situation is similar in other districts as well. In Bijapur, a tribal and forested district in Chhattisgarh, doctors and even paramedical staff at district hospital had been woefully inadequate. Officials say that it is tough to fill up vacant posts and retain doctors in rural and remote areas. Some feel that salaries offered within the government framework are often not an incentive for doctors to take up postings in rural areas. To address this shortage, many districts are now using DMF funds for hiring doctors on contracts and paying them competitive salaries.

HIRING DOCTORS THROUGH DMF

- **Location:** District hospitals and CHCs in various districts
- **Features:** Convergence with NHM and other funds, contractual hiring

The initiative was first taken in Bijapur, where salary funds from NHM were topped-up through DMF to hire doctors and other healthcare staff. This was done to incentivize doctors to work in this rural and tribal district. Since the district was looking at holistically developing the district hospital, having staff-members to work there was a basic requirement.

Converging DMF and NHM funds, Bijapur is paying competitive salaries to doctors to serve in the district. The district has currently hired 103 healthcare staff, including doctors, paramedics, nurses, pharmacists, etc. to work in the district

hospital, and at some of the CHCs and PHCs. For instance, under NHM, a specialist's salary is approximately Rs 1.43 lakh a month. The district is paying Rs 2.25 lakh, with the additional Rs 82,000 being funded through DMF. Bijapur also offered free accommodation and assistance with jobs for spouses of the doctors willing to serve as an added support (see *Table 11: Total healthcare staff and remuneration in Bijapur*).

The district also expedited the upgrade of its hospital so that doctors have necessary resources to work effectively. Bijapur hospital is now fully functional for the first time and is even conducting major surgeries.

The success of the initiative led other districts in Chhattisgarh to emulate this strategy. Dantewada, the neighbouring district, replicated the same model and hired 232 healthcare staffers across the district, including nine specialists.

Odisha's Keonjhar district is hiring doctors on contract separately through DMF instead of converging with NHM. Forty-two doctors have been recruited through DMF funds on contractual basis to work at the district hospital as well as at CHCs. Of these, 15 are MBBS doctors, 19 are specialists and seven are super specialists. The salaries are varied and are often negotiated based on the qualification, experience and location of posting of the doctor *(see Table 12: Salary of DMF doctors in Keonjhar district).*

To reduce attrition, the district is also hiring retired government doctors who are familiar with public healthcare challenges in rural areas. Sundargarh, another top mining district of Odisha, has also hired 59 doctors and specialists through DMF for postings in CHCs and the the district hospital as well as paramedics and staff nurses.

Table 11: Total healthcare staff and remuneration in Bijapur

Name of post	No. of employees	NHM monthly contribution (In Rs lakhs)	DMF monthly contribution (In Rs lakhs)
Specialist	10	14.34	8.19
Medical officer	5	0.98	5.34
AMO	16	3.08	2.43
Staff nurse	41	0.00	6.16
Lab technician	9	0.00	1.38
Pharmacist	2	0.00	0.27
Radiographer	1	0.00	0.09
Multi-purpose health worker (MPW)	6	0.00	0.60
Auxiliary nurse and midwife (ANM) and 2nd ANM	7	0.00	0.61
4th Class	4	0.00	0.25

Table 12: Salary of DMF doctors in Keonjhar district

Doctor	Monthly remuneration (in Rs)
MBBS	60,000–80,000
Specialist	1,20,000–1,80,000
Super-specialist	2,00,000–2,20,000

In Jharkhand, mining districts such as Dhanbad and West Singhbhum have also hired doctors on contract using DMF funds. West Singhbhum hired 22 healthcare personnel in January 2019 including eight MBBS doctors for the district hospital and CHCs. The doctors are paid a monthly remuneration of about Rs 1 lakh going up to Rs 1.8 lakh for some specialists. Additionally, they are paid a 20 per cent house rent allowance. Forty per cent of this salary is supported through DMF funds and the rest through NHM budget. Dhanbad district had hired 44 doctors through DMF funds.

However, the outstanding challenge is with retaining these medical staff. Most of these districts report high attrition, about 50 per cent on an average since the time they started hiring. Officials at all districts concur that the search to fill vacant posts is practically never ending as doctors keep leaving due to various reasons like the inability to cope with challenges that come with working in rural areas, to pursue further studies, etc.

PHOTO COURTESY: KEONJHAR DISTRICT

Having doctors at the district hospital and at CHCs has made a marked difference to people in mining-affected areas. For instance, surgeries can now be done in Bijapur since the hospital is working at full capacity. In Keonjhar district hospital, no surgeries were possible despite other specialists being there, as there was no anaesthetist. The district hired one four months ago and now small surgeries can be done at the hospital. At a CHC in Banspal, the new MBBS doctor is a god-send for people.

'Earlier, the CHC had no doctor. Now, even if there is an emergency late in the night, the doctor ensures that he attends to our needs,' said one of the patients in Keonjhar district's Banspal block. The CHC here now has two MBBS doctors hired through DMF. There is also a newly hired NHM doctor who feels that having the DMF doctors is a support to her as the CHC is a busy one and she alone couldn't have taken the entire load. Additionally, a gynaecologist hired through DMF visits once a week for consultation.

While many of the doctors who are being hired also leave after a few months, people feel that it is better than having nothing at all. 'Even if vacancies are to be constantly filled, having even one doctor in such locations ensures medical attention,' said Sulakshana Nandi of Public Health Resource Network (PHRN), Chhattisgarh. West Singhbhum, despite the attrition, is able to run the district hospital well, because of the DMF doctors.

Up-grading hospitals for healthcare delivery

BIJAPUR, CHHATTISGARH

- **88%** Rural population
- **80%** Scheduled Tribe population
- **10%** Villages with access to CHCs within 10 kilometer radius
- **7%** Villages with access to PHCs within 5 km. radius

District hospitals are the nodal points of secondary level healthcare for people, usually accessed for better diagnosis and treatment of bigger ailments. However, in many mining districts, serious deficits equipment and human resources have rendered hospitals sub-optimal, with patients routinely forced to go to the state capital or the nearest tier 2 city for better treatment.

With DMF, many districts are now upgrading the hospital infrastructure and filling deficits of some vital medical equipment. The perception is that a good facility will also help bring in and retain doctors at these facilities and improve access to healthcare in the region.

UPGRADING DISTRICT HOSPITAL BY CONVERGING DMF AND OTHER FUNDS

- **Expenditure on district hospital:** Rs 6.5 crore
- **Features:** convergence of funds; focus on service delivery, backed by hiring of adequate staff
- **Initial status of district hospital:** acute shortage of doctors and staff, inadequate equipment and resource

Located in south Bastar, Bijapur is known to be a left-wing extremist (LWE) district. It is also predominantly rural and has about 80 per cent tribal population. Access to healthcare in Bijapur is extremely poor as per locals. Not only primary healthcare, but even the district hospital, until some time ago, could only provide services equivalent to a PHC. All patients either travelled to Jagdalpur (160 km. away) or to Andhra Pradesh for surgeries and advanced treatment.

However, the district has prioritized upgrading its district hospital since 2017. Bijapur converged DMF funds with Special Central Assistance (SCA) and corporate social responsibility (CSR) funds to revamp its secondary healthcare system to

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provide treatment for patients with critical ailments. The revamp was also part of a bigger plan to bring and retain doctors by providing an atmosphere conducive for working.

The district has so far spent Rs 6.5 crore to renovate the existing district hospital and also construct operation theatres, ICUs, labour rooms, pathology laboratories, out-patient and in-patient areas, blood bank, etc. To improve support for new-born babies, and pregnant and lactating women, the district has also constructed a 50 bed mother and child health care centre along with a nutrition resource centre and labour room. The renovation and upgrading of the hospital took about two years. The district has also recruited staff on contractual basis at various levels at the hospital. Health practitioners say that Bijapur district hospital is one of the best public health facilities in rural areas.

> **'Five years back,** the hospital had the capacity for just 30–35 deliveries in a month. Now, we can have 150 deliveries,' said T. R. Kunvar, civil surgeon in Bijapur. 'We can now conduct laparoscopic surgeries or thyroid surgeries. In private hospitals these surgeries cost a patient somewhere between 2–3 lakhs but here it is done free of charge,' he added.
>
> Earlier, people had to travel as much as 700 kilometres for any treatment that required specialist services. Locals said that having a fully operational hospital has made it possible to have diagnosis and surgeries at Bijapur itself, which saves them the cost of travel and expenses of privately run hospitals.

CHATRA, JHARKHAND

- **10.4 lakh** Population
- **95%** Rural population
- **30** Beds available at district hospital
- **30** Beds available at referral hospital

Chatra, one of the more remote coal mining districts, faces a shortage of health facilities as well as health staff at both primary and secondary levels of healthcare. The district hospital as well as the referral hospital face a dearth of resources as well as poor infrastructure. For instance, for a population of about 10 lakh people, the district only has about 60 beds between the two secondary care hospitals as per 2018 figures. To address this deficit, as the first big step, the district is developing the CHC in its mining-affected area into a model one, having all required facilities and staff as per the Indian Public Health Standard (IPHS) norms.

DEVELOPING CHC INTO MODEL HOSPITAL

- **Estimated cost:** Rs 5 crore (including DMF and other funds)
- **Location:** Simaria block
- **Features:** Focus on delivery of services, provision of infrastructure, resources and staff

Chatra district has signed a MoU with Tata Trust's Transforming Rural India Foundation (TRIF) to develop the CHC at Simaria block into a fully functional health centre along with a malnutrition treatment centre (MTC) to address child nutrition issues among severely malnourished children. Tandwa and Simaria are two blocks which are considered by the district as directly-affected by mining. Tandwa is where all the mines in the district are concentrated, while Simaria is the neighbouring block through which most of the coal in the district is transported. Currently, the blocks have one CHC each, both facing a dearth of doctors, nursing staff and even beds and medical supplies. The upgraded CHC at Simaria is likely to improve access to public healthcare in both blocks.

The MoU is a three year non-financial agreement, in which Tata Trust will be the technical partner to develop the CHC. Tata Trust has been selected as it is already a technical partner on aspirational districts programme of the central government. Chatra is one of the aspirational districts selected to meet various development targets. Tata Trust also has experience in upgrading government hospitals in other states such as Telangana, Maharashtra, Madhya Pradesh, etc.

As per the MoU, Tata Trust will bring in the required expertise in planning the facility, sourcing of necessary equipment, hiring of doctors and paramedics, etc. As per official information, it will conduct a gap analysis of the CHC and prepare a road map based on that. It will also guide the construction and resourcing of the infrastructure as per IPHS standards. Additionally, to bring in proper staff, particularly doctors, it will assess the kind of incentives and facilities (such as residential or any other) required for retention. It will also develop a protocol and method to maintain the CHC.

The model CHC is estimated to cost Rs 5 crore and will be funded partially through DMF. The expected time of completion is about three years. The progress monitoring will be done by a committee comprising the district collector and other senior officials from various departments, and three members from Tata Trust.

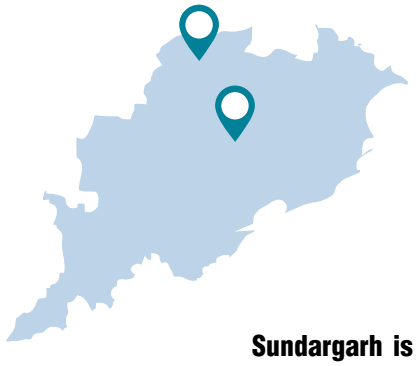
RAJEEV RANJAN /CSE

Punam Devi, who lives in Misrol in Tandwa, said that people usually end up travelling to small and private clinics which promise some of the basic tests which the government typically should provide. 'Tests at private clinics are expensive and unaffordable,' she said. Another woman from the village said that a well-developed public health facility would benefit them immensely. 'Currently, in the CHC there are no doctors and there is also a constant shortage of medicines,' she added.

The public health facilities in Chatra, particularly in the mining-affected area, are heavily under-resourced. Considering that, it is pertinent to use DMF funds to create health access for people in the mining-affected areas. The district is seeking external expertise to ensure compliance to IPHS standards and is also working on a maintenance plan, a sign that the investments are meant to be lasting and long-term.

Improving last mile health service delivery

SUNDARGARH & ANGUL, ODISHA



- **Rs 153 crore** Funds sanctioned for healthcare in Sundargarh
- **Rs 43 crore** Funds sanctioned for healthcare in Angul
- **5%** Villages with PHC within 5 km. radius (Sundargarh)
- **17%** Villages with PHC within 5 km. radius (Angul)

Sundargarh is one of the biggest iron ore mining districts of Odisha (only second after Keonjhar). The district's mining-affected areas such as Koida, Lahunipada, Kutra, etc. are rural and tribal. About 87 per cent of Koida's population, the district's worst affected mining area, is rural and about 70 per cent is tribal.[20] Remoteness of the mining areas has been a big challenge in establishing proper healthcare services in the region, with perennial shortfall in both healthcare staff and infrastructure. Primary healthcare, in particular, faces a shortfall of healthcare staff at PHCs and CHCs, as per district estimates from 2018.[21]

Mining areas of Angul, Odisha's coal district, are relatively better connected but access to primary healthcare is equally poor. In the worst mining-affected Talcher block, primary healthcare infrastructure in the villages is wanting both in resources such as equipment, medicines etc. as well as healthcare staff.[22] Just about 17 per cent villages have a PHC within a five kilometre radius. Both districts have invested through DMF in Mobile Medical Units (MMUs) to expand the existing network and improve reach of primary healthcare in remote areas.

MOBILE MEDICAL UNITS (MMUS)

- **Location:** Sudargarh (All blocks); Angul (Talcher, Chhendipada, Kaniha)
- **No. of MMU:** 25 (Sundargarh); 6 (Angul)
- **Annual budget of MMUs:** Rs 53.5 lakh (Sundargarh); Rs 9 lakh (Angul)
- **Features:** Focus on primary healthcare in remote areas, implementation through external agency

MMUs are typically run under the National Health Mission to improve public healthcare access in remote and difficult to access areas. Serviced by a doctor, a nurse, a lab technician and a pharmacist, an MMU is equipped to conduct tests such as blood tests, pregnancy tests, malaria and dengue tests, etc. and provide basic medicines. It is particularly known to be effective in ensuring pre-natal and post-natal check-ups among women.

However, district officials say that NHM budgets are often inadequate to run the required number of MMUs. The existing ones lack space for patient examination and there are often issues with regularity and recruitment of staff for remote areas. The lab test and medicine provisions depend on the local CHCs which are usually short of resources themselves, say officials.

Considering the remoteness of some of the mining-affected areas and the run-down state of primary healthcare facilities there, both Sundargarh and Angul districts have topped up the number of MMUs through DMF.

The DMF MMUs are being run through a public-private partnership (PPP) with a Madhya Pradesh based non-profit, Camp, which specializes in primary health access in rural areas. The organization was selected by taking out a tender. The districts pay a management fee and operation cost to the agency to run the MMU as per NHM norms. The monitoring is done through the medical officer at the local CHC.

Sundargarh is operating 25 MMUs currently to cover all 17 blocks in the district. Mining affected and forested blocks have most number of MMUs operating. The remote mining-affected areas such as Koida, Lahunipara and Hemgir areas have three MMUs each, the highest in the district, while the others have one or two depending upon the terrain and local needs. The focus of MMUs is specifically on

In Arakhpal village in Talcher, the MMU visits twice a month. Before it reaches, the local ASHA worker, Padmavati Pradhan, approaches all pregnant and lactating mothers getting them prepared for their check-up. 'I also inform anyone with symptoms of fever, aches or breathing issues so that they can come over for a check-up,' said Pradhan. Pradhan said that the MMU has spared people a 10 kilometre long commute to the nearest CHC for every small ailment. It has specially helped women with their check-up as many of them find it hard to travel that far during and right after pregnancy. MMUs in Angul face shortage of medicines at timed as they are sourced through the local CHC. In Sundargarh, the set-up is more adequate as Camp provides the medicines as per contract.

Health practitioners say that MMUs should be only a stop-gap intervention for remote areas while other facilties are being built.

the 62 gram panchayats (GPs) where there are no functional PHCs and CHCs in proximity. The MMU spends one week per GP touring the villages and hamlets according to a monthly route map.

Each MMU costs Rs 2.14 lakh including cost of staff, equipment such as stretcher beds, weighing machines, lab equipment, medicines, etc. The total annual spending for 25 MMUs in Sundargarh is Rs 53.5 lakh.

Angul district is operating six MMUs through DMF in all three mining-affected blocks of the district—two each in Talcher, Chhendipada and Kaniha. The total annual budget is Rs 9 lakh, with the cost of operation of each MMU being Rs 1.5 lakh. One MMU in a month goes to about 20 villages. It checks an average of 40–45 people per day.

The difference in budget between Sundargarh and Angul is due to the services provided. In Angul, the MMU supplies the medicines procured from the local CHC. In Sundargarh, Camp is taking care of medicine supply as well.

KEONJHAR, ODISHA

- **Rs 437 crore**
  Funds sanctioned for healthcare
- **4%** **Villages with PHC within 5 km. radius**
- **80%** **Average rural population in mining-affected areas**

Primary healthcare access is a looming challenge in the predominantly rural district of Keonjhar. Only about four per cent of the district's villages have a PHC in the five kilometre radius. The district's mining areas, be it the municipal area of Joda or the hilly and rural Banspal, face a shortage of PHCs, which are among the preliminary health contact for people. The existing PHCs have a dearth of ANMs, doctors, and basic medicines.[23] Locals and district officials also confirm this.

DIGITAL DISPENSARIES

- **Annual recurring cost:** Rs 192 lakh annually
- **No. of dispensaries:** 8
- **Location:** Directly-affected areas of Joda, Banspal, Harichandanpur
- **Features:** Use of digital technology for primary health care, focus on delivery of services

In a bid to improve primary healthcare access, Keonjhar has set up eight digital dispensaries in three mining-affected blocks—Joda, Banspal, Harichandanpur—on a pilot basis, to be scaled up later after impact feedback. The digital dispensaries are being run on the PPP basis through a contract signed with Glocal Healthcare, an agency which specializes in rural and remote area health delivery.

'Most of the basic healthcare issues can be addressed here,' said Priya Prusty, the ANM at the dispensary at Bamnipal village in Harichandanpur. 'The villagers had specifically asked for an intervention as they were travelling 20 kilometres to the local hospital even for treatment of basic ailments,' added Prusty. Patients at the dispensaries said that after a long time they have a health facility within reasonable reach. 'People in my village keep getting stomach infection due to poor quality of water and fever is also very common. Such ailments are easier to treat here. Since it is closer to our village, we come here in time for regular follow-ups as well. In more serious cases, they send people to a bigger hospital quickly from here,' said a patient who had visited to consult for recurring leg pain.

CHINMAYI SHALYA/CSE

The dispensaries have an operating unit which uses the internet to connect patients in villages to doctors available online in the Glocal repository. These doctors are located at various places, but registered at and verified by Glocal. For instance, in a digital dispensary at Bamnipal in Harichandanpur, some of the doctors regularly available online include a paediatrician from Kolkata, a general physician from Cuttack and a skin specialist from Rajasthan.

An ANM handles the consultation and feeds in the symptoms of the patients in the software, which then connects to the appropriate doctor available. Based on the review, the patient is either recommended medicines or sent for further referrals. Barring child delivery and counselling, the digital dispensary provides all services that a PHC would typically provide.

The dispensary has a small lab where tests for malaria, hepatitis, haemoglobin, dengue, HIV, strip-based tests such as pregnancy and urine tests and ECG can be done; and a small pharmacy that provides medicines free of cost. Infrastructure and equipment for each digital dispensary cost Rs 10 lakh. In addition, the DMFT pays Rs 165 per patient. For an average of 40 patients daily the recurring cost comes to Rs 24 lakh annually for each dispensary, including consultation, diagnostics and medicines.

The digital dispensary, however, has its challenges. The basic requirement for it is internet connectivity which makes it an intervention that will restrict itself to areas where internet can reach. Healthcare practitioners also point out that DMF must be used to also bolster the existing public health facilities and create a network of health staff, ambulance services, well-resourced referral facilities, etc. Additionally, scaling up such initiatives must involve a robust monitoring mechanism, without which the required standards are tough to maintain.

Direct benefit to the mining-affected through pneumoconiosis policy

RAJASTHAN

- **33,000** Mining leases in Rajasthan
- **30 lakh** No. of people engaged in mining and related jobs
- **Rs 3,500 crore** DMF fund accrued so far in Rajasthan

Rajasthan has the highest number of mines in the country, with over 33,000 mining leases, including major and minor mineral mines and quarries. Majority of these mines are sandstone mines and quarries operating in the small-scale sector. Mining and mineral processing industry is the major employer in about 19 of the 33 districts in the state, employing about 30 lakh people, followed by the building and construction industry as per state government estimates. The numbers are likely to be much higher, say local experts, as the sector is unregulated to a big extent.

The high exposure to fine dust from sandstone mines and construction has created a big health burden of silicosis among workers in Rajasthan. Silicosis is a terminal disease caused by constant exposure to soil, silica, coal dust and asbestos, often what sandstone mine and construction workers face. Poor enforcement of regulations for pollution control and mining practices, such as use of wet methods of drilling stone in mines, has been the biggest trigger of the disease among workers.

Until March 2020, there were 86,000 cases registered for silicosis screening in the state. Of these, about 7,600 were certified with silicosis. More than 28,000 were still pending for verification.[24]

The problem before Rajasthan is two-fold. First, to prevent silicosis tight enforcement of regulations on mining companies needs to be done to ensure compliance. Second, local health facilities need to be strengthened for early detection of diseases and rehabilitative aid needs to be provided to silicosis patients and their families.

Until 2016, the Rajasthan government provided a compensation of Rs 4 lakh to silicosis patients, of which Rs 1 lakh was paid to him/her and Rs 3 lakh to the family after the patient's death. This was paid through the Rajasthan Environmental Health Administration Board (REHAB), constituted under the Rajasthan Environment and Health Cess Rules, 2008. After DMF was instituted, REHAB was dissolved and compensation is being paid through the former. The process, however, is slow and has to be processed through district DMF governing council, which has a mandate to meet at least once in six months.

Considering this, the state has framed a pneumoconiosis policy under the social justice and empowerment department, to steer intervention to prevent silicosis and provide rehabilitation fund to the victims and their families. The policy was rolled out in October 2019 and it mandates the creation of a pneumoconiosis fund converging DMF, CSR, Building and Other Construction Workers Welfare Fund and the state budget.

The fund will provide rehabilitation support for silicosis patients. The amount has now been revised to a total of Rs 5 lakh, of which Rs 3 lakh will be given to the patient and Rs 2 lakh to the family after the patient's death. The disbursement of the money will be through the pneumoconiosis corpus and done directly to the beneficiary. All patients and cases in Rajasthan are being fed into a real-time silicosis portal.

The policy envisages that the fund will also be used to create livelihood avenues and training for the deceased's kin, many of whom are young widows who become the main wage earners of the family. Widows and children are also to be covered under the state pension and Palanhar scheme for orphaned children, irrespective of income.

There is a lot of focus on preventive measures, which include improving the diagnosis by upgrading health facilities with latest screening equipment and treatment resources, and training health workers and doctors for detection. On the industry side, the state will incentivize the industry for better mining practices and use of technology which are compliant with pollution and occupation hazard standards.

The state is still to create the pneumoconiosis corpus and issue sector-specific guidelines for implementation of the policy.

CHINMAYI SHALYA/CSE

'There is no substitute for the lives lost, but the increased compensation gives some cushion to families, specifically to the wives and small children, before they start fending for themselves,' said Rana Sengupta of Mines Labour Protection Campaign (MLPC).

The focus on livelihood training for the kin of the deceased also holds immense promise, as in most cases the wives and children end up working in mines and are caught in the vicious cycle of disease and poverty. 'There are hardly any options for work which give decent money. If there can be any other option available and we are given a chance, we will most happily switch,' said Sita Devi, a 28 year old widow whose husband died of silicosis three years ago.

Locals and health workers feel that early detection of the disease will also go a long way in controlling mortality. 'Currently, many CHCs and even doctors are not trained enough to distinguish clearly between tuberculosis and silicosis. Proper screening and training will certainly allow for a cure,' said a health activist based out of Bhilwara district.

LIVELIHOOD

Lack of secure income and sustainable livelihood opportunities are the looming concerns in all mining-affected areas, reflected acutely in high proportion non-workers in working-age group, of marginal, casual and manual workers, and poor income levels of the people.

Income security and livelihood opportunities are the foundation of securing better standards of living and have a bearing on other human development indicators as well. Consequently, creating viable livelihood avenues for mining-affected people is a key prerogative of DMFs.[25]

However, so far, this focus on livelihood has remained only on paper. The topmost DMF states have barely invested in it. For instance, in Odisha, despite a clear mandate to look at livelihoods based on local and natural resources, barely two per cent is currently sanctioned for livelihood enhancement. In Jharkhand, due to a state mandate, the focus has only been on drinking water supply, construction of toilets and a few healthcare initiatives.

While investments in livelihood are negligible overall, there have been some instances over the last year where districts have sanctioned funds for livelihood based on the strength of the communities and available local resources. Most of these are geared towards enhancement of income among mining-affected families and towards creating models that are self-sustaining.

◄◄ PHOTO CREDIT: CHINMAYI SHALYA/CSE

Agricultural interventions through wadi cultivation, tasar rearing and millet farming

KEONJHAR, ODISHA

- **45%** Proportion of cultivators in rural mining-affected areas
- **69%** Population below poverty line
- **90%** Rural households with the highest earning member earning less than Rs 5,000 per month

Keonjhar is the biggest mining district of Odisha, accounting for almost half of the total iron ore production in the state. The district has about 86 per cent rural population, and about 45 per cent of its population is tribal.[26] The income level in the district is poor. About 69 per cent of Keonjhar's population lives below the poverty line[27] and in about 90 per cent of the rural households the highest earning member earns less than Rs 5,000 per month.

In an attempt to enhance income of families in mining-affected areas, Keonjhar DMFT is supporting agriculture-based livelihood. The move also seeks to build on the local skills given that about 45 per cent of workers in the rural mining areas are cultivators, and about 81 per cent of them are small or marginal farmers.[28]

Three specific livelihood programmes are being implemented using DMF funds in the district—wadi cultivation, tasar rearing, and millet farming.

WADI CULTIVATION

- **Proposed project cost:** Rs 31 crore
- **Location:** Directly-affected areas of Banspal, Jhumpura and Sadar
- **Features:** Convergence with MGNREGA, implementation through local partners, long-term hand-holding support

An agro-forestry initiative, wadis are known to be beneficial in regions where soil is degraded. The idea behind wadi is to cultivate fruit-bearing trees such as cashews, mango, pepper, etc. for commercial purposes and improving farmer incomes.

Wadis are already being promoted by the National Bank for Agriculture and Rural Development (NABARD) across the country as part of its tribal development program for sustainable livelihood, promoting women's work participation and building entrepreneurial ability among local communities. The project is supposed to work in convergence with Mahatma Gandhi National Rural Employment Guarantee Act (MGNREA), and various departments such as irrigation, agriculture, horticulture, etc.

Keonjhar is supporting wadi cultivation through DMF on the lines of NABARD, but improving upon it by ensuring proper availability of resources. The funding per wadi has been almost doubled. For instance, NABARD has a funding of Rs 55,000 per acre of land, but the budget usually falls short in ensuring sturdy fencing, proper irrigation, etc. As per practitioners, it would cost about Rs 1 lakh to set-up a wadi properly, a reason why many times the farmer and even the organizations end up footing the cost personally. Also, inter-departmental coordination required in NABARD model usually causes delays. This is where farmers lose interest as the fruit of their labour is five years away and there is no immediate earning. Through DMF, Keonjhar is providing Rs 1.5 lakh per acre to cover all initial costs.

The district is targeting 1,500 beneficiaries in three mining-affected areas with an estimated average of one acre (about 70 trees) per beneficiary/family. The farmers chosen are those who have at least half an acre of land (and no more than five acres). Prior to this, they were sustaining on paddy and vegetable cultivation.

The project is contingent on availability of at least 20 acres of land around a village and the willingness of farmers to work together. It is estimated that each family will have an additional income of Rs 30,000 in the first three years, and thereafter the target is to increase it to Rs 50,000 per year.

Three local NGOs, with prior experience in wadi cultivation, have been selected through tender to implement the work. Their role includes identifying beneficiaries, facilitating community meeting, building farmers' capacity, and helping with plantation and intercropping. They are also responsible for creating the value chain, facilitating market linkages and organizing the farmers into village development committees (VDC) to start with and farmer producer organization (FPO) eventually. They will be handholding the farmers for five years after which the wadi will be run by the farmers themselves. The NGOs have a dedicated team comprising a technical and enterprise expert and a project coordinator.

Table 13: Fund outlay for wadi project

Works	Estimated budget (in Rs crore)
Plantation (labour and material)*	25.9
Human resources on the ground	2.26
Training and capacity building	0.5
Institution building	0.25
Monitoring and evaluation	0.25
Management fee	2
Total	**31.1****

*Of this, about Rs 15 crore is through DMF and about Rs 16 crore from MGNREGA; **The fund outlay is for seven years, since the project will be implemented in phases.

Keonjhar DMFT is paying the NGOs a management fee and the cost incurred for human resources annually (see *Table 13: Fund outlay for wadi project*).The management fee, however, is contingent on the performance and survival rate of plantations. For instance, a less than 60 per cent survival rate would not fetch any fee for the agency.

The wadi plantation started in 2018 and over past two years, 900 acres has already been brought under cultivation. At these wadis, mango and cashew trees have been planted. As they mature, farmers are inter-cropping with vegetables and legumes. For monitoring, the NGO partners are required to maintain records of the work and the beneficiaries, and submit monthly, quarterly, and annual progress reports to the district DMF body. The district will also conduct an annual social audit of wadis. The audit for the first year was ongoing at the time of publication of the report.

CHINMAYI SHALYA/CSE

The DMF wadi in Jhumpura's Asanpat village has 122 households as beneficiaries. They are small farmers engaged earlier in paddy and vegetable cultivation and are now working together on the Wadi near their village. Trees have already been planted, and currently farmers are intercropping vegetables while the trees grow. It takes about three to five years for the trees to grow fully.

Satyabhama Naik, who usually earns Rs 60,000 from paddy and vegetables grown during the kharif season (which coincides with the monsoon), had earned Rs 15,000 more in the same spell by growing brinjals and tomatoes. 'I plan to grow more in the rabi season,' she said. According to Naik, the best part about the wadi is sturdy fencing and the availability of water for irrigation, which is likely to enable vegetable cultivation even in non-monsoon months. Another villager, Sunaphula, said he managed to add Rs 20,000 to his income by growing cucumbers and selling them.

At another wadi, a mason is now also cultivating on his land which was lying unused, barring some vegetables his family grew. He said that while he and other farmers wait for the trees to grow, the intercropping is helping them sustain and even improve the income.

PROMOTION OF TASAR REARING AMONG TRIBAL FARMERS

- **Proposed project cost: Rs 23.8 crore**
- **Location: Directly-affected areas of Banspal, Jhumpura and Harichandanpur**
- **Features: Focus on tribal families, women in leadership role, convergence with MGNREGA, long-term hand-holding support**

To improve income of tribal families, and bring tribal women in entrepreneurial and management roles, Keonjhar is supporting tasar rearing in three mining-affected areas—Banspal, Jhumpura and Harichandanpur. More than 50 per cent population in these areas is tribal, many of whom are engaged in small-scale tasar-rearing in forest fringes over generations.

Odisha (including Keonjhar) already has a precedent of tasar rearing. The state stands third in terms of tasar production after Jharkhand and Chhattisgarh.[29] Consequently there is existing state support and machinery to support rearing. For instance, Odisha Co-operative Tasar and Silk Federation Limited (SERIFED) already provides subsidized eggs and buys back cocoons from the farmers. Additionally, women tasar rearers were trained for better rearing practices under National Rural Livelihood Mission (NRLM) some years ago.

But, the rearers are largely reliant on forests, which they say have depleted over the years, thereby affecting their income. Also, the cocoons suffer due to poor quality of eggs.

The DMF tasar rearing project is creating tasar plantation of host trees, Arjun and Asan, on degraded revenue land selected on the basis of a sericulture map developed by the Central Silk Board, taking into account soil and climactic conditions conducive to tasar tree cultivation. Small-time tasar farmers have been roped in for rearing on this land and given tree patta (title). In addition to the rearing they practice in the forest, the farmers will work on the plantation in a more controlled and monitored way. Female members of many of these families are already organized into self-help groups and have training in rearing tasar in the forest. The focus is on making women farmers take leadership in managing the work, handling accounts and making decisions on emerging requirements and needs.

Keonjhar is targeting to rope in 600 beneficiaries/families (at least one hectare per beneficiary), each having about 80–100 host trees. The produce will be picked up by SERIFED, the certified state agency for tasar promotion.

Two local NGOs are working to implement the project along with the district sericulture department. Their role includes identifying beneficiaries and then handholding them through plantation of trees, intercropping, collectivizing women into tasar vikas samitis (TVS), training for better rearing practices, etc. for a period of six years. After that, the NGOs will exit and hand over the project to the communities involved.

The implementing agencies will be paid a human resource cost as well as an overall management fee, disbursed annually. The management fee, however, is contingent on the performance and survival rate of plantations.

The district estimates a project cost of Rs 23.8 crore in convergence with MGNREGA which will account for the labour cost for plantation *(see Table 14: Fund outlay for tasar rearing project).*

CHINMAYI SHALYA/CSE

Kanchan Pradhan of Talajagar village in Banspal says that her earnings from tasar rearing have been reducing over the years 'We have been rearing tasar for generations. Even my mother-in-law used to do the same work,' said Pradhan. However, income from tasar has been dwindling over the years as the forest got scant.

Pradhan and others farmers like her grow paddy in small patches of land for self-consumption and rear tasar in the nearby forest to sell cocoons to the state agency. They have an average annual income of Rs 80,000 combining the two. 'The earnings can be erratic if cocoons are at times diseased,' said Oshali Pradhan, another tasar cultivator.

At Talajagar, 20 families of their village are rearing host trees in a 20 hectare piece of land and they are looking at two cycles of cultivation in the plantation. Kanchan and Oshali are also the head and treasurer of the TVS of their village. Under their management, they have ensured that the plantation is well protected with cattle-proof trenches and is irrigated properly. Once the trees mature after three years, they are likely to add Rs 40,000 to Rs 60,000 in their income from forest-based tasar rearing and small farming.

Table 14: Fund outlay for tasar rearing project

Works	Estimated budget (in Rs crore)
Plantation (labour and material)*	21
Human resources on the ground	1.1
Training and capacity building	0.4
Monitoring and evaluation	0.2
Management fee	1

*Of this, about Rs 15.6 crore is through DMF and about Rs. 8.2 crore from MGNREGA

So far, 200 hectares of land has been earmarked and utilized for tasar plantation in Banspal and Harichandanpur. Training of farmers, exposure visits, etc. have been completed here. The TVS of the women farmers have also been formed and they are managing the funds and day to day work, with the help of the organizations.

MILLET CULTIVATION UNDER MILLET MISSION

- **Proposed project cost:** Rs 24 crore
- **Location:** Directly-affected areas of Joda, Champua, Sadar, Banspal, Harichandanpur, Hatadihi and Jhumpura
- **Features:** Focus on tribal families, women in leadership role, convergence with MGNREGA, long-term hand-holding support

To build climate resilience in agriculture for income security and shift towards consumption of millets to address nutrition as well, the Odisha state government has started Millet Mission to support farmers in cultivating millets in 13 districts. Keonjhar, which wasn't part of the mission, volunteered to support cultivation of millets through DMF, but as per state guidelines. The aim is to change the agricultural crop preference from paddy to millets and getting households to consume them and eventually integrate them into public schemes such as ICDS, mid-day meals and even public distribution system (PDS).

Though the district's plan is to convert as much area as possible to millet cultivation, to start with it is targeting about 3,500 hectare land to be brought under millets over five years. The beneficiaries are farmers who would be willing to switch to millet cultivation. As an incentive, the district will give Rs 2,500 to Rs 5,000 per hectare for the first year to farmers who adopt recommended agronomic practices.

Local facilitating agencies (NGOs), with prior expertise in millet farming methods have been chosen through bids for implementing the work, along with the district agriculture department. The NGOs have selected beneficiaries, trained them in cultivation techniques and will hand-hold them to ensure productive transition to millets over five years. There is one facilitating agency per block which will also help create a FPO for commercial millet marketing and selling. Some part of the produce will be picked up by the state government in the initial supporting years.

The total estimated budget for five years is Rs 24 crore. Of this, 20 crore is for cultivation related expenses which include expense of seeds, training of farmers, cost of community resource persons, setting up local processing centres so that millets are made easy to consume, etc. Rs 4 crore is set aside for promotional work such as setting up recipe stalls in local fares, training of AWC workers, research on best ways to address nutritional needs, etc. The district is also setting up hiring centres for farming equipment at the block level which are being run by women SHG groups. Currently, four such centres are already set up.

In one year, about 88 hectare of agricultural land has been brought under millet cultivation across four blocks and 41 villages, involving 300 farmers. This first round of cultivations has also been about trying various varieties out of which suitable varieties of millets will be shortlisted.

In July, Vasudev Mantri, as he prepared the seed bed for millets, felt he was just trying out a new crop on his 1.25 acre land. He said he had nothing to lose. He had invested about Rs 25,000 in tomatoes and maize last year but untimely rain destroyed the crop and he did not earn anything out of it.

'There is no regular income I have. Sometimes the vegetables I grow are good and I can sell them. If not, there is just enough for the family to eat,' he said. With millets, Mantri has hopes that the crop will flourish. He was trained by the local group KIRDTI to plant millets and crop them in a way that they absorb water and soil well.

Currently, farmers in the area have grown a variety of millets from ragi to foxtail millets. 'After the first season, they will now decide which millet they would prefer to grow,' said one of the members of KIRDTI. Farmers who have small patches of land next to a water source are also asked to grow the crop in rabi season when there is no rainfall.

'Millets are a strong crop and they need less water. If rains fail or are delayed, the crop can hold up and farmers are likely to produce enough to sell,' said Duskar Barik of Keonjhar Integrated Rural Development and Training Institute (KIRDTI), one of the local implementing NGOs. The district officials said that they are already in the process of setting up local processing units so that it is easier for people to consume them. 'Millets are hard to cook, one of the reasons, why it was easy for people to shift to paddy,' said an official.

CHINMAYI SHALYA/CSE

Promotion of organic farming and Kadaknath chicken rearing

DANTEWADA, CHHATTISGARH

- **58%** Proportion of cultivators among workers
- **97%** Cultivated area under paddy cultivation
- **95%** Rural households with the highest earning member earning less than Rs 5,000 per month

Located in the sourthern-most corner of the district, Dantewada is a rural district with more than 70 per cent tribal population.[30] Agriculture is an occupational mainstay in rural Dantewada. About 50 per cent of the district's area is net sown area, and close to 97 per cent of it is under paddy cultivation.[31] The district is known as the biggest contributor of rice to the organic food market.[32] People also rely on forest as a source of food-fodder-firewood and minor forest produce.

In Dantewada, 58 per cent of the workers are cultivators and 24 per cent are agricultural labourers. But farm holdings are small with about 5,700 marginal farmers (owning less than one hectare land) and 4,300 small farmers (owning 1–2 hectare land). Agriculture is largely rain-fed and only 5–8 per cent of the cultivated area is irrigated.[33]

Income level in the district is poor. In about 95 per cent of the rural households the highest earning member earns less than Rs 5,000 per month. To improve income and work participation of local farmers, particularly local women, the district is using DMF funds for two agro-based initiatives—promotion of organic farming, and promotion of Kadaknath chicken rearing on a commercial scale.

PROMOTION OF ORGANIC FARMING

- **Proposed project cost:** Rs 6.7 crore (DMF component)
- **Location:** Across the district
- **Features:** Convergence with state funds and CSR, enhancing local strengths and resources, focus on women farmers, long-term handholding support

The organic farming in Dantewada aims to build upon the available indigenous varieties of paddy and produce and market them at a commercial scale, in line with the state's ongoing Jaivik Kheti Mission. Since 2015–2016, the work for organic farming is being done through convergence of funds from the agriculture department, CSR and DMF.

The work was initiated through an NGO, Nirman, which started with collectivizing small and marginal farmers and then training them to cultivate various varieties of paddy that are endemic to the region. The training included improvement of agricultural techniques, making resources such as seeds, irrigation, equipment, etc. available, support in creating a FPO, and help in setting up storage, processing and market linkages. The focus has been to shift farmers from self-sustenance agriculture to commercial cultivation and boost income.

Farming experts first trained a team of 100 community resource persons (Jaivik Karyakartas), local educated youth, on techniques of organic farming, who then have been assisting about 10,000 farmers across 124 villages. About 20 per cent of these villages fall in the directly-mining affected area in the district. As a result of this work, about 16 per cent of the district's net sown area has been now certified as organic.

Nirmaan also helped farmers create an FPO called Bhoomgaadi Organic Farmer's Producer Company Limited, a collective of 2,700 organic farmers, including 800 women farmers. The FPO decides the procurement rate which is higher than the market rate, sets the selling price, and strategizes planning for cropping and requirements of resources, etc. on a regular basis. It has a revolving fund (provided through DMF) for its operations. The company had a turnover of Rs 90 lakh in 2018–19. Bhoomgaadi is marketing the produce to 35 different cities across India under a certified organic brand name, Aadim.

The district has set up godowns and storage facilities, processing units, and an organic cafe where some of the processed produce is sold and served. The district has so far invested Rs 6.7 crore for organic farming *(see Table 15: DMF fund break-up for organic farming promotion in Dantewada).* The largest proportion of funds is for training and capacity building and payment of salaries for the local resource persons.

Table 15: DMF fund break-up for organic farming promotion in Dantewada

Activity	Amount (in lakh)
Capacity building, training and salary of resource persons (Jaivik Karyakartas, cluster coordinator, master trainers, block coordinators)	152
Renovation of processing unit and new construction	32
Machinery for processing units such as rice mills, millet processing machine, etc.	22
Wiring and electrification of processing unit	4
Boundary wall for processing unit	2
Capital for procuring and instalment of machinery in processing unit	29
Revolving Fund: (Note: 50 lakh was given in first phase and 22 lakh is sanctioned in second phase but amount has been partly transferred)	72
Human resource support (For Bhoomgadi and organic café staff)	67
Solar cold storage in convergence with Creda	40
Construction of Jaivik Café and Jaivik Bazar	100
Resource centre at Geedam (including recurring budget)	140
Tata magic vehicle	10

PRASHANTH CHINNAPPANAVAR/CSE

Local farmers involved in organic agriculture under the initiative have benefitted not only in improving their produce but also in enhancing their income. Interactions with the farmers reveal that earlier they were selling some of their produce in the market for any rate that was ongoing. Now, the FPO procures the produce at a higher rate for selling. This has improved their income.

Bhima Ram, a local farmer and also one of the board members of Bhoomgadi, said that knowing and practicing better agricultural methods has improved the quality and production of paddy for most farmers like him. Many who were using chemical fertilizers have stopped doing so and have still seen a growth in the yield.

Farmers also felt that decision on the procurement and selling price of their produce through the FPO is empowering and has helped build confidence in them to pursue organic farming in the region.

PROMOTION OF KADAKNATH CHICKEN REARING

- **Proposed project cost:** Rs 4.4 crore
- **No. of poultry farms:** 167
- **No. of beneficiaries:** 2,200
- **Features:** Enhancing local strengths and resources, focus on women SHGs

To generate livelihood opportunities and enhance income of local tribal women, Dantewada is promoting rearing of local Kadaknath chicken. Kadaknath is a breed of fowl found in parts of Madhya Pradesh such as Jhabua and also reared in a small way around the Bastar region of Chhattisgarh. Kadaknath chicken is known to have less fat content compared to other chicken varieties and is thus considered healthier for consumption.

The Kadaknath rearing programme started on a small scale in 2016–17 through the state agency Krishi Vigyan Kendra (KVK) and included support for individual poultry farmers. However, in about a year, it was expanded through DMF funds to SHG run farms. With the help of KVK, which is the technical implementing agency, the district brought together and trained local tribal women who were school drop-outs, or farm labourers, or widows or single parents in the 18–45 year age group to rear Kadaknath chickens.

The beneficiaries, which were selected through the National Rural Livelihood Mission (NRLM), were already organized into SHGs and saving money, but were not linked to any commercial activity. They have been trained to rear the fowl and helped with shed construction and feed making by KVK, which is the implementing agency.

Currently, there are 164 Kadaknath poultry farms in Dantewada engaging 127 SHGs comprising 2,200 tribal women. Of these, 12 are located in the directly mining-affected areas.

Through DMF, KVK provides 300 chicks to each farm for two rearing cycles and feeds to last one year. After this, the poultry farm is self-sustaining. The women use its earnings to buy chicks and feed from KVK centres at subsidized rates.

The rearing cycle of Kadaknath chicks is four to five months, after which they are ready to be sold in the market. One kilo Kadaknath meat costs Rs 700 in the open market Each farm on an average earns Rs 2–3 lakh in about five months. Since 2016, Dantewada has invested Rs 5.2 crore for Kadaknath poultry *(see Table 16: Year-wise fund outlay for Kadaknath poultry in Dantewada).*

Table 16: Year-wise fund outlay for Kadaknath poultry in Dantewada

Year	Funds allotted (in Rs crore)
2016–17	0.86
2017–18	2.14
2018–19	2.20
Total	5.2

Champa Atami, a farmer in Kasoli village of Dantewada, used to grow mushrooms and other vegetables in a seven acre patch of land she owns. The produce was enough for her to feed her family and sell some surplus in the market to buy other necessities.

Already a member of Indravati Mahila SwaSahayata Samuh, the local SHG, she is now also a poultry farmer, rearing Kadaknath. The shed is set up in her land leaving some space for her vegetable cultivation. Over two years of poultry rearing, her SHG has earned about Rs 4 lakh per rearing cycle by selling the birds in the local market. 'Every member (of the SHG) contributes to the work and we have a small income and also maintain the farm,' she said. Some local SHGs said that they also sell their produce to the local CRPF camp. Interviews with the poultry farmers suggest that each SHG member earns around Rs 30,000 to 35,000 per rearing season.

While the district has scaled up Kadaknath poultry farming significantly, it has not established any market linkages for the poultry farmers to sell their produce to a wider and more profitable market. So far, the chicken is sold only in the local market. This, according to both district officials as well as locals working with tribal women in the regions, can be limiting. They feel that income generation through Kadaknath can increase further if proper market linkages are established. Additionally, it can generate more local employment in the value chain sector.

PRASHANTH CHINNAPPANAVAR/CSE

EDUCATION

Providing access to quality education and improving levels of learning is one of India's key sustainable development goals. However, in most mining districts, particularly in remote and tribal areas, the state of public education is fraught with poor infrastructure, and dearth of both resources and teachers. Meagre income also limits people's ability to send their children to private schools. In these areas the dropout level of children is also considerably high after elementary school, particularly among the girls. Even though Sarva Shiksha Abhiyan (SSA) and Rashtriya Madhyamik Shiksha Abhiyan (RMSA) have been allotting considerable budgets for elementary and middle school education, the goals are far from met.

DMF comes as a big additional resource for mining districts to improve on overall educational outcomes through focused interventions. This includes strengthening primary, secondary and higher education to improve gross enrolment and reduce dropouts, improving learning outcomes among marginalized and tribal communities, increasing employability among youth, empowering the vulnerable sections, and reducing overall financial insecurity.

However, barring a few cases, such targeted intervention is yet to happen through DMF funds. While most states (and districts) have allocated a sizeable proportion of their budgets for education, most of it is for construction and repair of school buildings. Some have provided furniture, books, uniforms, etc. A handful of districts have sanctioned funds for coaching students for competitive exams for higher education or scholarships, though these remain overall district programmes and do not specifically target children from mining-affected families.

In this scenario, two initiatives stand out. The first one is an education intervention in Kabirdham of Chhattisgarh where DMF fund is being used to fill teacher shortages in primary and middle schools, to support local language education among the Baiga community and also to improve livelihood opportunity for the youth of this particularly vulnerable tribal group (PVTG) by employing them as teachers in these schools. The second example is from West Singhbum district of Jharkhand, where the district is augmenting vocational education through a nursing training school to improve employability of local women, particularly from tribal communities who are the predominant social group in the district.

◀◀ PHOTO CREDIT: CHINMAYI SHALYA/CSE

Investing in education by hiring local teachers

KABIRDHAM, CHHATTISGARH

- **Rs 24 crore** Total DMF funds
- **90%** Rural population
- **320** Teacher posts lying vacant
- **82%** Primary schools not meeting pupil-teacher ratio (PTR) criteria

Kabirdham is a small district in Chhattisgarh, located on the Madhya Pradesh border. With about 90 per cent of the district's population living in rural areas, access to decent education is a challenge for the vast majority of the people. The situation is more challenging in the tribal blocks of the district that are in forested and hilly terrain. Bodla and Pandariya are two such blocks where tribal population is about 39 per cent and 23 per cent respectively

With a small DMF corpus of Rs. 24 crore, one of the key DMF intervention in the district includes appointment of teachers in primary and middle schools in above mentioned tribal blocks. This has been prioritized considering the huge teacher deficit in these blocks, where more than 320 teacher posts are lying vacant as per information given by the district administration. This constitutes about one-fourth of the total sanctioned posts for these blocks.

HIRING LOCAL TRIBAL YOUTH AS TEACHERS

- **Total number of teachers hired so far:** 107
- **Location:** Bodala and Pandariya blocks
- **Features:** Addressing teacher shortage, livelihood for local tribal youth

The district is recruiting teachers on a contractual basis through DMF. It is primarily engaging educated but unemployed Baiga youth to improve learning outcomes among children, to ensure retention of teachers and to create employment opportunities for unemployed youth.

The district's education department placed an advertisement seeking eligible high school pass teachers for primary schools and graduate teachers for middle schools. The advertisement invited applications only from people of Baiga tribe living in the region. In the first stage, the schools which either have a single teacher or no teacher at all have been prioritized. As per district officials, the recruitment has been more for primary schools as there were fewer applications for middle school due to low level of education among the community. Total 107 teachers have been hired, of which, 100 are for primary schools and seven for middle school.

While the salary given to contractual teachers is far less compared to those of regular teachers in the district, locals view this as a positive first step. For instance, a grade teacher in a primary school for comparable hours and days draws about Rs 18,000 per month, while the contractual teachers are paid only Rs 8,000. However, Deepika Joshi from Public Health Resource Network (PHRN), who researches on the Baiga community in the region, feels that the situation will improve. Like several others, Deepika thinks that this step is a big opportunity to strengthen tribal education in the areas and to build confidence of the Baiga youth who are being engaged in these schools. 'Many of them might now even feel motivated to pursue higher education,' she said. As per information provided by the district education officer, district, school drop-outs are being counseled to pursue and complete education as private candidates so as to improve education levels and create a bigger pool of local teachers.

PRASHANTH CHINNAPPANAVAR/CSE

Sonraj, a twelfth standard pass out, was until now engaged in some farming activities. His new appointment in Chindidih government primary school has brought much satisfaction to him. 'Apart from getting an opportunity to be a teacher, I am happy that this also gives me the scope to contribute to educating children of my own community,' says Sonraj. The sentiment is echoed by many of the new teachers.

The parents in the region are happy about the way recruitments are happening. They feel having teachers from the local community will help children particularly in primary schools to engage better. Deepak Bagri, coordinator of the non-profit Samerth Trust working on education in the area, says, 'the teachers come on time regularly and are more invested in the community. Before their appointment other teachers were not regular, never came on time and were not interested in teaching. Moreover, they used to leave the school early, immediately after the mid-day meals were served'.

Investing in vocational education for local women

WEST SINGHBHUM, JHARKHAND

- **Rs 940 crore** Total DMF funds
- **60%** Non-working women in West Singhbhum
- **47%** Female literacy
- **4%** of total literate women have graduation level education

Though it is the biggest iron ore mining district in Jharkhand, West Singhbhum is crippled with poverty and unemployment. About 50 per cent of the district's population is engaged as manual or casual labourers with no secure income. Overall, about 54 per cent of the district's population falls in the non-working category. The situation is worse among women as 60 per cent of them are non-workers and about 26 per cent are marginal workers.[35]

The education levels among the women in West Singhbhum are poor. Just about 47 per cent women are literate (as against 65 per cent in India), and just about 4 per cent of them make it till graduation as per Census 2011 data. Considering this, it becomes imperative to bring more women into the work force through vocational training. Also, in view of the dearth of health staff in areas such as West Singhbhum, it is also important to have trained local workers who can stay invested in the region over a long period of time.

While most of the DMF sanctions in West Singhbhum are for drinking water and sanitation as per the state mandate, the district has made some sanctions in other sectors as well. One of such initiatives includes supporting vocational education for local women.

RUNNING COLLEGE FOR NURSES

- **Investment so far:** Rs 3.5 crore
- **Features:** Vocational training for young women, opportunity to augment healthcare personnel

By converging DMF funds with resources of the state welfare department, West Singhbhum has invested in a nursing training college. West Singhbhum has revamped an old and dilapidated building, which was earlier a general nursing and midwifery training college, to start the Auxiliary Nursing and Midwifery (ANM) training college in its place. The college has been developed with the assistance of PanIIT Alumni Reach for Jharkhand (PReJHA), a special purpose vehicle created as part of collaboration between PAN-IIT and Jharkhand's welfare department for skill development in the state. PReJHA is in charge of operating the college, ensuring

proper staffing and taking care of recurring costs such as salaries, maintenance, etc. The renovation cost and the resources to make the facility functional have been provided for through DMF funds. The total investment for the college stands at Rs 3.5 crore.

The nursing college is specifically for women residing in Jharkhand who are within 17–30 years of age. To be eligible, they should have completed high school and scored a minimum of 45 per cent marks in any stream. PReJHA has tied up with private medical service providers for internship and placement of students. In Agugust 2019, the training college enrolled its first batch of 120 women from West Singhbhum, East Singhbhum, and Saraikela Kharaswan districts.

The ANM training college is a positive step towards generating livelihood among local women. This is also a means of addressing the dearth of front of the line healthcare workers in districts such as West Singhbhum. Interaction with local communities as well as district officials across states has suggested that for primary level of service delivery of healthcare and even education, it is important to have trained people from the region as they are likely to have a sense of belonging and are thus better invested in their jobs. In this sense, creating a local cadre of trained ANMs will not only facilitate livelihood, but also address some of the healthcare shortages districts face. The district has invested in the college by converging DMF funds with resources of the state welfare department.

RAJEEV RANJAN/CSE

Draupadi Sumroi is a current student of the Nursing College and comes from the remote village of Belpos in Sonuwa block. In her family, her father is the sole worker and employed as a labourer. She explains that because of their poverty there was always a lack of resources and support for studies. When she came to know about the Nursing Kaushal College, she immediately applied for it. The college has linked her to a government scholarship to support her two years of study. She feels confident today and adds that professional and disciplined teaching along with best lab facilities at the college have not only enhanced her knowledge base but also developed her personality. She hopes to emerge as a good nurse and take care of her family with the job she gets after passing out from the college.

Punami Devgam is another student of the nursing college who comes from remote Jamkundia village of the Saranda region. Punami says that the college provides a very good learning environment, along with other facilities like food and lodging. She considers this a life changing experience and expects to serve her community and support her family in the future.

INTEGRATED WATERSHED DEVELOPMENT

Shortage of water for agriculture, livestock maintenance, as well as domestic consumption is a looming concern in the mining areas. The situation also has bearing on livelihood and income of the communities.

Integrated watershed management is known to be one of the most sustainable ways to restore the ecosystem and revive the soil and water bodies. It also results in enhancement of livelihood and local income through agricultural and allied activities. The Ministry of Rural Development of the Government of India has also recommended an integrated watershed management approach as the best water management practice.[36] Such an approach can help in drinking water protection, pollution control, agriculture enhancement, fish and wildlife habitat protection and preservation of native vegetation. It is also economical as it builds upon existing resources and creates opportunities for long-term community development.

The central government has stipulated guidelines for integrated watershed management in convergence with MGNREGA. This looks into various aspects such as revival of water bodies, rainwater harvesting, plantation activities, and roping in local communities, particularly women SHGs for livelihood initiatives. However, since 2014, the funding for integrated watershed management programme has stopped and the works for water harvesting and ground water recharge are currently being done under the Pradhan Mantri Krishi Sinchayi Yojana (PMKSY).

In a bid to revive water stressed mining areas, specifically the agrarian areas where the soil quality is also degraded, integrated watershed management is being supported in a few districts through DMF. One of the most holistic approaches so far has been adopted by the Angul district of Odisha. The district has invested DMF funds, in tandem with Government of India's 2011 guidelines, for watershed management in all three blocks notified as directly mining-affected.

◄◄ PHOTO COURTESY: ANGUL DISTRICT

Integrated watershed management to conserve water and provide livelihood

ANGUL, ODISHA

- **12.7 lakh** Population
- **Rs 1,290 crore** Total DMF funds
- **Rs 15 crore** DMF funds sanctioned for watershed development

Angul is the biggest coal mining district in Odisha and one among the top five districts having highest DMF collection. Most of the mines in Angul are clustered in Talcher area which is worst affected by mining. Chhendipada and Kaniha are the other two blocks which are also directly and indirectly affected by mining.

The district is mostly rural and relies on agriculture and allied activities.[37] However, the district faces critical water stress. All three mining-affected blocks fall under poor to moderate water deficit category as per the district's irrigation plan.[38] Projections show that water stress in the region is only set to worsen with rising demand for industrial, agricultural, livestock and domestic use. In this scenario, integrated watershed management is an important measure to address water stress in the region on a sustained basis, while also looking at opportunities for livelihood enhancement.

MICRO WATERSHED PROJECTS

- **Total number of micro watersheds:** 24
- **Total project outlay:** About Rs 15 crore
- **Location:** Kaniha, Talcher and Chhendipada blocks
- **Features:** Water conservation, promotion of related livelihoods

The district has created 24 micro watersheds (water ponds) covering 62 villages, for conserving run-off water from rains to be used for irrigation and also improving the groundwater recharge. By collecting water runoff during monsoons, the structures helps in ground water recharge and arresting soil erosion in the region. These micro watershed projects have been created in convergence with MGNREGA (see *Table 17: Details of micro watershed projects in Angul district*).

Table 17: Details of micro watershed projects in Angul district

Block name	No. of micro watersheds	No. of villages	Area (Ha)	Projects outlay (Rs crore)	Households
Kaniha	12	34	6728.47	8.0738	2772
Talcher	7	16	3094.42	3.7333	1840
Chhendipada	5	12	2587.99	3.1056	1645

The district is going by the Centre's 2011 guidelines for allocating funds towards various integrated watershed management programmes. The guidelines stipulate that 56 per cent of the budget be spent on natural resource management/watershed development works. The rest of the funds can be allocated for various other activities such as developing livelihood, production and micro enterprise, building capacity of local communities to maintain the structure, improving agricultural practices, etc. (see *Table 18: Components of integrated watershed management*).[39]

Table 18: Components and budget break-up of integrated watershed management

Works	Total budget allocation (%)
Natural resource management (watershed development works)	56
Preparatory phase including institution and capacity building, preparing detailed project report (DPR)	10
Production system and micro enterprises	10
Livelihood activities for asset-less persons	9
Administrative costs	10
Consolidation	3
Monitoring and evaluation	2

Works under various components have been planned as per the central guidelines. A key outcome of these projects so far has been improving crop yield. The number of farming households and areas under cultivation have also increased in these areas. Subsequently, villagers are also thinking of allied livelihood activities such as pisciculture.

A representative case is the Kandhabereni micro watershed project in Kumuda gram panchayat of Talcher block. This is located within a distance of about five kilometres from the nearest coal mining area. The watershed work was taken up in Kandhabereni village to improve livelihood of small and marginal farmers. Over the past few years the agricultural output and associated income of these farmers had been affected by droughts and irregular monsoons.

In 2017–2018, the watershed program commenced in this village through DMF funds with a budget outlay of Rs 54.5 lakh. About 454 hectares were targeted to be covered through integrated watershed management works. The district started off by building awareness among farmers and local communities about the watershed scheme and its benefits.

Since watershed development works are long term projects, only partial outcomes could be captured at the time of this report. For example, in Kandhabereni, one water harvesting structure has been completed. The structure which had cost Rs 8.8 lakh is currently benefitting 17 farmers. Through improved scope of irrigation, the extent of area being cultivated (primarily paddy cultivation) has nearly doubled. The village watershed committee is further supporting pisciculture activities in this micro watershed area to augment the income of the local community.

PHOTO COURTESY: ANGUL DISTRICT

Farmers around Kandhabereni micro watershed project have small land holdings where they usually cultivate paddy. The cultivation was only rain-fed and restricted to once a year, making the produce only enough for self-consumption. With the water available in the micro watershed pond, the farmers are now preparing for a crop in the non-monsoon seasons as well. They expect their produce to grow at least by a quarter.

'Due to a lack of water many of us did not even use the land for cultivation. This time I have grown paddy and due to availability of water, I will grow it again for a second round in the winter. Availability of water in the region will also motivate others to take up agriculture,' said Bala Dehury, who was about to harvest his first crop. He worked as a casual labourer before this.

The micro watershed has also supported pisciculture in the villages and the people had their first fish harvest in January 2020. Some local SHGs have also been provided financial assistance for goat rearing, cultivation of mushrooms, etc.

SECTION III
CHANGES IN POLICY

Optimizing benefits for mining-affected people and ensuring equitable and sustainable development of the mining-affected areas lies at the core of DMF. For this, three things are crucial—identifying mining-affected people, engaging the affected communities in DMF decision-making, and improving the scope and effectiveness of DMF investments by engaging local communities/Gram Sabha members in DMF planning and monitoring.

This requirement is also clear in the objective and contour of the DMF Trust as specified under the law. Section 9B (1) of the MMDR Amendment Act (2015) specifies that DMF is a non-profit trust. Being a statutory trust obligates DMFs to identify and benefit the intended beneficiaries, who are the mining-affected people. Section 9B (4) further specifies that composition and functioning of DMF Trusts should be guided by constitutional provisions as related to the Fifth and Sixth Schedules for governing tribal areas, the Panchayats (Extension to Scheduled Areas) Act (PESA) of 1996, and the Scheduled Tribes (STs) and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act of 2006. This essentially underscores people's participation in decision-making processes including planning, particularly through Gram Sabha members, and their representation in decision-making bodies. The State DMF Rules and PMKKKY guidelines also subsequently mention the power and role of the Gram Sabha in mining-affected areas for identification of beneficiaries, DMF planning, and review of works and schemes.

However, there has been a critical gap in all three aspects in the first four and half years of DMF implementation. For example, while various states had started identifying mining-affected areas adopting varied approaches, not even a single state/district has identified the beneficiaries (mining-affected people) as the DMF rules and the PMKKKY guidelines prescribe. This has left out some of the most crucial beneficiaries of the DMF Trust, such as people who have been displaced by mining and people who have lost their livelihoods (including forest-based livelihoods) due to mining.

Similarly, the DMF decision-making body, comprising the governing council and managing committee, has been dominated by government officials, members of legislative assembly (MLA) and members of Parliament (MP). The local representation in some cases comes through elected Panchayati Raj Institution

(PRI) members. There has been no representation of general mining-affected people in the DMF body. DMF planning has also remained top-down like its administration. No district has developed a comprehensive DMF plan yet through a bottom-up process engaging Gram Sabhas. The engagement with Gram Sabhas, is only limited to informing them about projects and receiving their signatures.

Lately, both the central government and the state governments have shown more commitment towards addressing these issues. In a significant move in January 2019, the Ministry of Mines put out a number of recommendations to improve DMF implementation. Two key issues that were emphasized are identification of DMF beneficiaries and engaging Gram Sabhas in the very inception of DMF planning to improve investments.[40] Some state governments have also emphasized these aspects through amendments introduced to the state DMFT rules.

The government of Odisha amended the state rules in September 2018, and a key component of it was to make DMF investments targeted, especially for directly mining-affected areas and communities. The amendments specified that not more than 40 per cent of DMF funds can be utilized for activities in indirectly affected areas. The amendments also put emphasis on 'livelihood programmes' specifying it as a 'high priority' issue (see *Table 19: Key amendments in DMF Rules of Chhattisgarh and Odisha*).

In 2019, the Government of Chhattisgarh did a more comprehensive reform of the DMFT in the state. After a multi-stakeholder consultation, the state government amended the DMF rules in August 2019 to make it more people-centric. For the first time among all states, general Gram Sabha members were made part of the DMF governing council. Ten Gram Sabha members from directly mining-affected areas are to be made part of the governing council, and for Scheduled areas, at least 50 per cent of the Gram Sabha members must be from the ST category.

Table 19: Key amendments in DMF Rules of Chhattisgarh and Odisha

Chhattisgarh	Odisha
Ten members of Gram Sabhas in directly-affected areas to be part of the DMF Governing Council	Not more than 40% of funds to be used for activities in indirectly affected areas
Clear identification of DMF beneficiaries (mining-affected people) and directly-affected areas through experts	Support of livelihoods under high priority
Five-year vision document mandated based on need-based approach to guide annual investments	Specified road connectivity to unconnected habitats as a key area
At least 50 per cent of DMF funds to be spent on directly mining-affected area; cap of 20 per cent on DMF investment on physical infrastructure	
Provisions for social audit clearly outlined	

The rules have been amended to improve the scope of DMF investments and streamline them. For instance, a 20 per cent cap has been put on the use of DMF funds for developing physical infrastructure to prevent misuse of funds on big projects such as roads, bridges, industrial parks, etc., and to improve investment on soft resources.

The amendments require districts to identify mining-affected people and delineate mining-affected areas with precision. Provisions have also been introduced to improve DMF planning in order to achieve outcomes in a targeted and time-bound manner. For instance, districts have to develop five-year vision documents for the DMF Trusts through a need-based approach to capture people's needs and aspirations. This will also guide yearly DMF investments. Civil society experts may also be considered in developing the five-year plans.

SECTION IV

CONCLUSION AND RECOMMENDATIONS

District Mineral Foundation Trusts started sanctioning funds for various developmental projects and works in almost all top mining states and districts since 2016. In these four years the biggest challenge with DMF Trusts across the board has been effective utilization of funds, considering the scope of the fund and the potential to improve the lives and livelihoods of mining-affected communities. At the same time there have been challenges with ensuring that the right people and the most affected areas receive the benefit. This is because districts had not identified the mining-affected people, or properly delineated directly and indirectly mining-affected areas.

However, as captured in this report, there have been some efforts to improve DMF investments in order to address some of the critical issues ailing mining-affected communities. While some of these projects are not yet up to scale or have only been rolled out on a pilot basis initially, they do provide some important learnings which can provide guidance to DMFs in various states and districts. Reform in state DMF rules in line with directions from the central government can also improve DMF functioning. All these measures, along with other innovative approaches, certainly will improve implementation of DMFs in the best interest of mining-affected communities.

Improving DMF functioning

Considering the objective and guiding principles of DMF, various state governments need to introduce the necessary amendments to their respective DMF rules. The Ministry of Mines in January 2019 had already provided guidance on these lines and some of the state governments have also started making amendments, as discussed in the report. The changes in the state DMF rules should particularly focus on ensuring the following:

1. **The DMF decision making body should be inclusive with representation from mining-affected people**—Mining-affected people must be included as governing council members. This shall include general members of the Gram

Sabha (or ward members as the case may be). For Scheduled areas it must be ensured that at least 50 per cent of the Gram Sabha members represented in the governing council shall be Scheduled Tribes.

2. **Governing council and the managing committee should have checks and balances in power, scope of expression of opinions of various members, and fair decision-making**—The governing council should predominantly be a people's body comprising of various 'stakeholders' of DMF. It should have Gram Sabha representatives (ward members) from directly-affected areas, elected public representatives, besides other concerned stakeholders of DMF such as mineral concession holders and civil society organizations working in the mining-affected areas on issues that are of 'high priority' for DMF. The managing committee should have representation from all departments of the district that are concerned with DMF implementation, including planning, execution of various works/schemes and fund management.

3. **All DMF Trusts should identify and notify the beneficiaries** (**the mining-affected people**)—The mining-affected people should be identified as defined in the state DMF rules and the PMKKKY guidelines. Every DMF should also prepare and maintain a list of the prospective beneficiaries of the DMF Trust, which should be updated every five years. The Trust shall also maintain a list of beneficiaries (a web-based MIS) who are to benefit through works/schemes targeted towards individuals or a particular group of people.

4. **All DMF Trusts should identify and delineate the mining-affected areas**—Both directly and indirectly mining-affected areas should be delineated on a priority basis. The DMF Trusts shall prepare and maintain geo-referenced maps of mining-affected areas. For this purpose the support of the State Space Application Centre or similar institutions/expert agencies may be sought. The funds eligible to be used for DMF administrative costs can be used to delineate mining-affected areas.

5. **The rules must emphasize on DMF planning with both long term and immediate focus**—The state-specific rules must require a five year perspective plan for all DMF Trusts that is need-based and outcome oriented. At the same time requirements must be specified for a bottom-up annual planning mechanism in line with the vision and targeted outcomes of the plan. Appropriate guidelines need to be developed as the rules for DMF planning.

6. **Minimize the scope of misplaced investments**—It must be ensured that at least 60 per cent of DMF allocations/sanctions are for the 'high priority' issues as stipulated in the state DMF rules, as well as for the 'directly-affected' areas. At the same time a cap can be placed on proportion of DMF funds that can be spent towards physical infrastructure. For instance, the Chhattisgarh Rules as amended in August 2019 put a cap of 20 per cent on such spending.

7. **Review mechanisms of DMF Trusts and works undertaken by it must be strengthened to ensure utmost public accountability**—Both financial and performance audit must be mandated for DMF Trusts and should be conducted by qualified chartered accountants/auditors empanelled by the Comptroller and Auditor General of India. Additionally there should be an independent social audit to have improved scope of public review and engagement.

Improving effectiveness of DMF fund use

To improve the effectiveness of investments in various sectors and delivery of services, DMFs need to consider the following:

1. **Focus on delivery of service:** The objective of any public programme is to provide services to people. For this, augmenting soft resources is critical, such as health staff in hospitals or teachers in schools. DMF funds must be used for soft resources besides improving infrastructure to ensure service delivery. Healthcare and education investments in Bijapur and Kabirdham are good examples of this. The focus on service delivery will help in planning strategically.

2. **Convergence of funds:** DMF plans/investments may consider convergence and integration with other plans and programmes of the Centre and state governments to improve the scope of intervention. This will also prevent duplication of works as well as optimize use of available resources.

3. **Consider DMF funds to improve scope and scale of existing interventions:** Since DMF is an untied fund, it can be used to enhance existing works and schemes and improve their reach. The instances are clear in case of increasing the number of MMUs in Sundargarh and Angul, or in Dantewada where Kadaknath rearing was expanded to include women SHGs through DMF. Similarly districts in Odisha are also increasing the scope of millet farming through DMF.

4. **Focus on local resources and indigenous skills and knowledge:** Local resources and knowledge of communities must be harnessed optimally to improve DMF investments, particularly for livelihood enhancement and income generation. Building upon local resources and strengths of communities is important for both implementation and ensuring long term viability of the projects. It is also important for creating local ownership. The livelihood case studies from Keonjhar and Dantewada districts exemplify such approaches.

5. **Engaging local partners (NGOs) or experts for implementation:** Districts are typically short of required staff to roll out big initiatives on their own. Additionally, the existing departmental staff is already engaged in regular government schemes. For better implementation, districts must consider engaging local partners with expertise and experience in specific sectors where

investments are being planned. The engagement can be done through well laid-out terms and conditions by concerned departments and through regular monitoring. The livelihood projects in Keonjhar, Dantewada's organic farming and nutrition interventions in both Anuppur and Keonjhar districts show that involvement of local experts helps in implementing works at a larger scale.

6. **Cross-cutting investments across sectors:** DMFs must look at investments which can offer co-benefits to multiple issues. For example, Kabirdham is addressing shortage of teachers by employing local and unemployed Baiga youth; Keonjhar's millet mission is looking not only at income generation, but also at local nutrition intervention and improving local diets through millets. Such approaches are helpful in optimizing the scope of fund use and development of mining-affected communities in a more holistic manner.

ANNEXURES

Annexure 1: Sector-wise DMF sanctions in top districts of Jharkhand

Sectors	Proportion of total sanctions (%)				
	Dhanbad	Ramgarh	Chatra	Bokaro	West Singhbhum
Drinking water	79.3	76.2	71.5	98	70.2
Sanitation (Swach Bharat Mission)	6	7	19.5	2	6.6
Healthcare	1	0.6	0.7	-	1
Others	13.7	16	8.3	-	22

Source: Department of Mines and Geology, Jharkhand (as on January 2020)

Annexure 2: Sector-wise DMF sanctions in top districts of Chhattisgarh

Sector	Proportion of total sanctions (%)		
	Korba	Dantewada	Raigarh
Drinking water supply	9	3	7.4
Environment preservation and pollution control	3	1	0.8
Healthcare	5	16	6.7
Education	27	22	8.2
Agriculture & allied activities	4	14	2.4
Welfare of women and children	4	3	4.1
Welfare of aged and disable people	0.4	0.2	0.1
Skill development & employment	1	8	3.6
Sanitation	5	2	5.4
Jan kalyankariYojna (Ujjawala)	3	2	18.5
Physical infrastructure	28	26	30.3
Irrigation	6	1	1.2
Energy and watershed development	4	2	11.3
Various development and infrastructure related projects	0.1	0.1	-
Others (unspecified)	0.4		-

Source: DMF office of Korba, Raigarh, Dantewada (as on January 2020)

Annexure 3: Sector-wise DMF sanctions in top districts of Odisha

Sectors	Proportion of total sanctions (%)				
	Keonjhar	Sundargarh	Angul	Jharsuguda	Jajpur
Drinking water	34.3	11	70.5	32.2	9
Education	8.2	13.7	9.1	6.6	6
Healthcare	17.4	5.6	4.2	17	9.6
Welfare of women and children	0.5	5.8*	0.5	2*	0.5
Livelihood***	1.6	0.8	0.8	2.3	0.1
Skill development	1.3	3.1	1.1	1.3	1.1
Environment protection and pollution control	-	6	-	5.7	-
Sanitation	0.2	0.5	0.6	2	0.004
Welfare of aged and disabled	0.02	-	0.1	-	-
Housing***	-	-	-	0.1	0.4
Physical Infrastructure**	23.4	52	9.6	6.8	63.8
Irrigation	11.5	-	2.1	21.3	9.4
Energy and watershed	1.2	0.8	2.0	1.8	0.1
Afforestation	0.3	0.2	0.2	0.6	0.2
Administrative expenses	0.1	-	-	0.3	0.2

*Also includes investments for welfare of aged and disabled; **also includes arterial road connectivity in remote areas; ***Odisha DMF Rules consider housing and livelihood (distinct from skill development) as a high priority issue.

Source: District DMF offices of Keonjhar, Sundargarh, Angul, Jajpur and Jharsuguda (as on January 2020)

Annexure 4: Sector-wise DMF sanctions in top districts of Madhya Pradesh

Sectors	Proportion of total sanctions (%)	
	Singrauli	Anuppur
Drinking water	7.1	1.8
Environment preservation and pollution control & measures	2.2	0.1
Healthcare	8.5	13.2
Education	17.2	8.6
Welfare of women and children	1.4	5.8
Welfare of aged and disabled people	0.8	0.2
Skill development	9.2	13.4
Sanitation	0.007	1.3
Physical infrastructure	48.6	41.7
Irrigation	–	0.7
Energy and water shed development	4.9	3.1
Others	–	9.6

Source: District offices of Singrauli and Anuppur (as on January 2020)

Annexure 5: Sector-wise DMF sanctions in top districts of Rajasthan

Sectors	Proportion of total sanctions (%)	
	Bhilwara	Rajsamand
Drinking water	16.9	20
Environment preservation and pollution control & measures	4.8	8.8
Healthcare	5	5.6
Education	26.6	9.6
Rehabilitation aid for silicosis patients	1.3	0.2
Skill development	0.3	-
Sanitation	2.5	1.9
Physical infrastructure	37.8	32.5
Irrigation	3.7	-
Social justice	0.7	21.3

Source: Office of mining engineer, Bhilwara and Rajsamand (as on January 2020)

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Over the last five years, District Mineral Foundations (DMFs) have been developed across most mining districts of India with a precise mandate to work in the interest of mining-affected people and areas. The philosophy behind DMFs is *people first*. Through DMF, the right of people to benefit from the mineral-rich land they live on has been recognized for the first time.

CSE has been monitoring the progress of DMFs since their inception. While it took some time to get them started off, many districts have come a long way and have developed practices that can be emulated by others. This report focuses on the progress made by districts and also an attempt to highlight some of the best practices.

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