

## **PROGRESS REPORT FOR COMPONENT 3 FROM NOVEMBER 2022 TO AUGUST 2023**

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This chapter reports the progress of component 3 [C3] of the SATREPS-MNGD project entitled “The operation model of construction measures for problematic soil aimed at reducing rural road disasters is developed.” The members of this component have been conducting activities in South Omo Zone, Southwestern Ethiopia.

### **C3 core members for interdisciplinary research and progress of C3 research activities**

The 19 members and collaborators are leading all component 3 activities until now. Especially during this academic year, Dr. Worku A., who is the director of Road Research Center, Ethiopia Authority [ERA], and Mr. Negash from ERA collaborated with us for the second demonstration of the road construction in the model site in Jinka. Six members and collaborators at the right bottom side of Jinka began working with us for the preparation of this second demonstration in this academic year.

C3 aims to conduct activities from three aspects. First, it aims to collect information on and analyze the occurrences of road disasters along with the current state of countermeasures taken in the South Omo Zone. Second, it intends to develop operation models that pertain to construction measures for problematic soil with additives for soil modifiers. The final objective is to establish an operating model that involve construction measures for problematic soil and a road maintenance and management system (Figure 1).

### **Collect information on and analyze occurrences of road disasters**

The first issue is to collect information on occurrences of road disasters and the current state of countermeasures undertaken in the South Omo Zone (Figure 2). We collected geographic points and information on the repaired road through

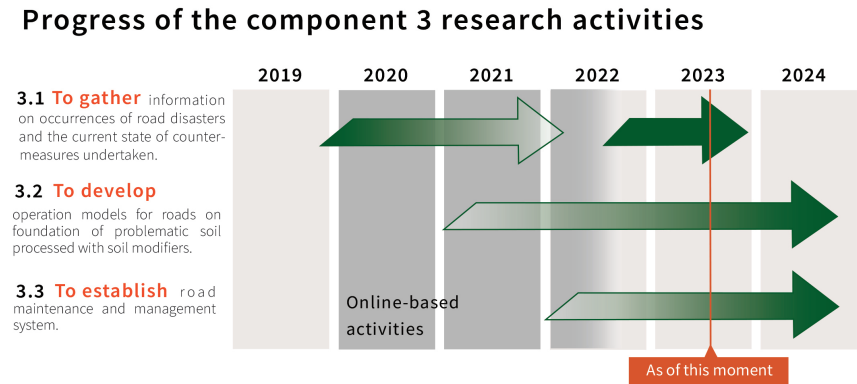


Figure 1. Progress of the component 3 research activities.



Figure 2. The location of the model site for the MNGD project.



interviews in the area (village B). The second issue is to develop operation models of construction measures for problematic soil. Toward this end, C3 intends to conduct the driving experiment in the Jinka University(JKU) compound. The last issue is to establish operational models of construction measures for problematic soil and the road maintenance and management systems. For further discussions, C3 aims to hold the second MNGD demonstration in an area called Bitamal.

For the first issue, C3 is collecting geographic points and information on the repaired road through interviews with 21 *buddin* leaders in village B. At the same time, each geographic point is identified on the map. We plan to create the map to enhance the understanding of critical sections in the area. According to the interviews, the majority of the *buddin* leaders experienced repairing the roads by themselves (Table 1). One of the common repairs is expanding the width of the road around their houses. The locals in village B constructed many of the community roads.

## **Developing the operational model**

C3 is preparing the site of the driving test, and the grinder shade for producing plant-based additives was constructed in the JKU compound for the next driving test (Figure 3). After the Joint Coordination Committee meeting, driving tests will be conducted by mixing the candidate additives on November 2023 (Figure 4).

## **A road maintenance demonstration and Training workshop**

Whenever I visit the model site, I receive several phone calls and contacts from local officials and leaders about the possibilities, how they can ask our project to start the community road construction in their villages. The project began preparations for training workshops on the MNGD project technology (Figure 5) as the one of future possibilities of introducing technologies from this project to people after the relevant activities. Prof. Fukubayashi introduced one of the project outcomes to local officials, who were involved in the road administration in *kebele* and *woreda* offices in November 2022.

Prof. Fukubayashi provided his lecture on our community road construction technology as a part of the training workshop in November 2022 (Figure 6). The majority of the participants were specialists in road construction in local

**Table1. The list of the *buddin* in village B**

	<i>Buddin</i>	Number of <i>Buddin</i>	The Number of Road*
1	Gomisha	30	4
2	Abeba	c.a.30	1
3	Gebremiraku	38	1
4	Andineto	35	2
5	Koboku	n.d	n.d
6	Salem	21	2
7	Tadagi	25	0
8	Wonenana	18	5
9	Hibreto	c.a.40	1
10	Girjabaak	43	3
11	Anzaizo	35	3
12	Mailako	66	2
13	Addis Katema	38	1
14	Achakal	c.a.80	7
15	Baabinaamer	32	2
16	Tele	32	0
17	Lemlem	30	2
18	Gabisha	27	2
19	Mahal-Baytsemer	30	3
20	Burutokan	35	4
21	Alugene	30	2

\* The number of the road, which was repaired by community members

Source: Interview data 2023/8/7-8/15, 2023/9/18-9/20

government institutions. Due to the first demonstration in village B, we could use this road for training materials on how the locals could maintain it by themselves.



**Figure 3. Grinder shade under construction in September 2023.**



**Figure 4. Test driving site in September 2023.**



**Figure 5. Training workshop in November 2023.**  
**This photo was taken by S. Matsukuma.**





**Figure 6. On-site training workshop in November 2023.**  
**This photo was taken by S. Matsukuma.**

## **Candidate of the second demonstration**

In August 2022, the chief administrator of Baco-Dowla *woreda* requested support from us for the construction of the road between village B and the health center in Bitamal (Figure 7), because the route between these places is located in a swampy area, which consists of black cotton soil. He also recognizes that the road condition of our first demonstration was well maintained and lasted for more than four years. The number in Figure 8, such as 1, 2, and 3, point to the scenery in the candidate area. The present route for locals is a foot pass (Figure 8) in the swampy area (Figure 9) across seasons. The locals have used the foot pass for visiting the health center. Thus, No. 3 could be used as the one of the field experimental sites for understanding the features of black cotton soil (Figure 10).



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**Figure 7. Location of the health center.**



**Figure 8. The route from village B to health center.**  
**Photo taken on October 31, 2022.**





**Figure 9. Swampy area on the way to health center.  
Photo taken on October 31, 2022.**



**Figure 10. Location of the health center.**

## Collaboration with local institutions

This Bitamal road construction has been conducted by not only locals in the community but also other institutions such as *woreda* and *kebele* offices, South Ethiopia Road Authority, and Ethiopia ECWC in collaboration with the MNGD project. The *woreda* and *kebele* officers (Figure 11) work with us to let locals work in selecting the route between village B and the health center. Moreover, they collaborate with locals to construct the road. South Region Road Authority (Figure 12) kindly offered to let the *woreda* office use a grader to form the road surface before locals with the MNGD project began road construction using MNGD technology. ECWC (Figure 13) conducted a laboratory test for understanding the features of the soil.



**Figure 11. The meeting with woreda and kebele officers.**  
Photo taken on January 2nd, 2024.





**Figure 12. The meeting with the Jinka District Manager of South Region Road Authority. Photo taken on July 31, 2023.**



**Figure 13. The meeting with the head of ECWC, Jinka office. Photo taken on August 10th, 2023.**

**Planned activities for C3 from October 2023 to March 2024**

In the second half of this academic year, from October 2023 to March 2024, the C3 continues to conduct several activities according to the three issues. First, the C3 collects data for creating the map for understanding critical sections. For the second issue; basic data from the weather station should be collected and analyzed it. The C3 began preparations for the test-driving with plant-based additives in collaboration with Components 1 and 2. The last issue is the preparation for other demonstrations in the model site.