

3. ベースライン調査報告書（英語版）

Report on Baseline Survey

PREFACE

The Project for Capacity Building of the Alemgena Training and Testing Center of ERA has been launched since April, 2002 in order to strengthen the training capacity of the country's sole vocational training institute for mechanized road construction method, as part of the RSDP, and urgently increase the necessary manpower.

In this context, the project has conducted the study to identify the training needs from the relevant organizations and companies that helps to strengthen qualitatively and quantitatively of the Ethiopian human capacity of mechanized road construction and maintenance. In addition to this objective, the result of this survey will be better utilized to evaluate the verifiable indicators of the project purpose on PDM (Project Design Matrix).

This report has been summarized based on the result of interview and responded questionnaires.

The data collected is limited, but we are sure that for the implementation of the project and for the understanding of the current situation of the construction equipment operation, construction equipment maintenance and road construction and maintenance supervision in Ethiopia, it is very useful.

We wish to express our gratitude to related all of you with whom it cooperated.

24 February 2003

The Project for Capacity Building of the ALEMGENA
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Chapter 1 Introduction

1. Objectives

The Project for Capacity Building of the Alemgena Training and Testing Center of ERA has been launched since April, 2002 in order to strengthen the training capacity of the country's sole vocational training institute for mechanized construction method, as part of the RSDP, and urgently increase the necessary manpower.

In this context, the project has conducted the study to identify the training needs from the relevant organizations and companies that helps to strengthen qualitatively and quantitatively of the Ethiopian human capacity of mechanized road construction and maintenance. In addition to this objective, the result of this survey will be better utilized to evaluate the verifiable indicators of the project purpose on PDM (Project Design Matrix).

This report has been summarized based on the result of interview and responded questionnaires.

2. Survey Period

The survey was carried out from August to November, 2002.

3. Target of the survey

The main targets of the survey are district offices of Ethiopian Roads Authority, Rural Roads Authorities and Construction Companies.

In addition, we surveyed the construction equipment dealers.

The details of the target of the survey are in "Annex 3-1) Target of the survey".

4. Response rate, Collection rate

Unfortunately, the response rate was not high, approximately approaching only 70% so far.

The following is a detailed response rate of each organization.

ERA, District office: 70%

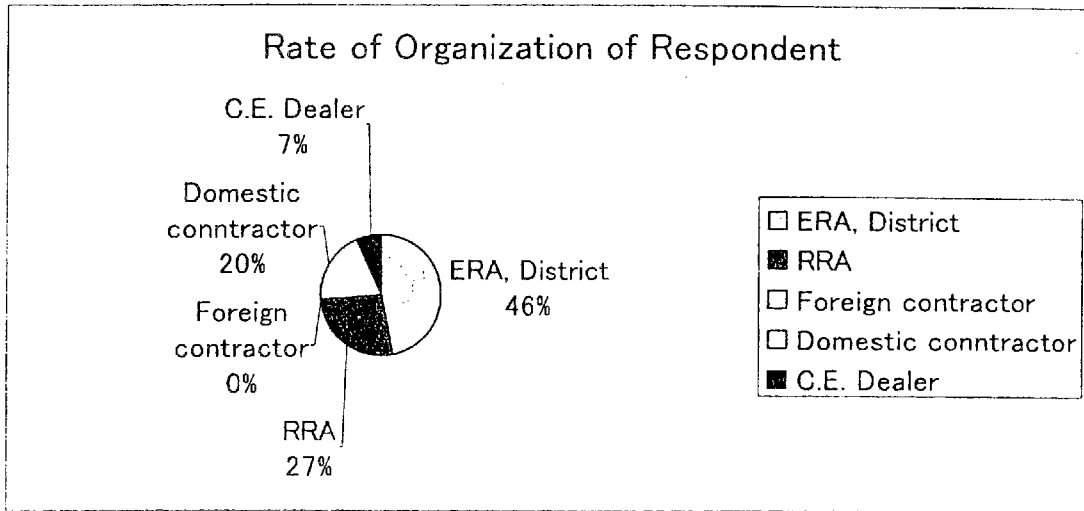
RRA: 67%

Private company: 43%

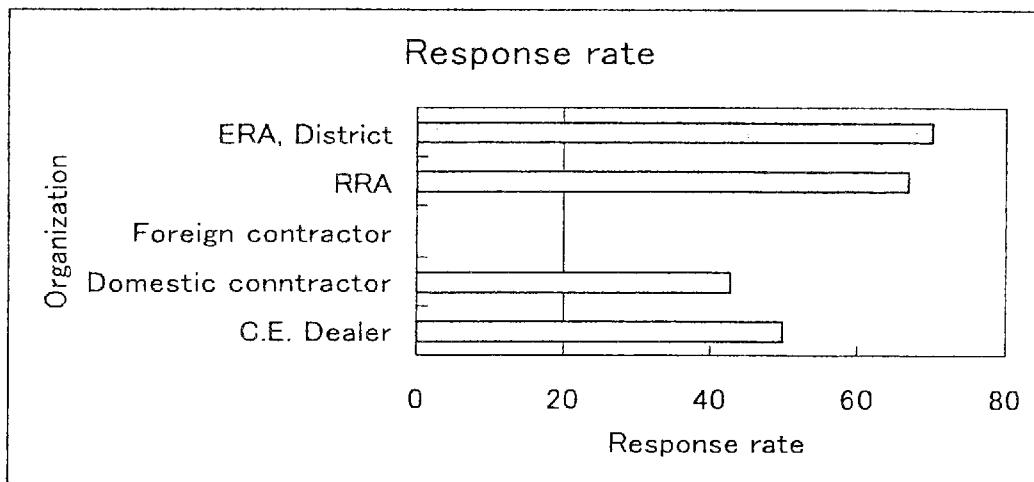
If we take this low response rate into consideration, this might be caused by the following reasons.

1. The form of questionnaire was not proper to fill in.
2. They cannot afford to spend time filling the form
3. They might not have an interest in the training at AT&TC.

The details of the response rate of the survey are in "Annex 3-2) Response rate".



Note: 100%=Total number of response (15)



Note: 100%=Total number of each target

Chapter 2 Result

1. Publicity level of AT&TC

Within the public sector, the AT&TC is known as the training institute for the person who works for ERA or RRA. But the private sector's interviewees whom we met did not know the detailed missions of the AT&TC.

2. Maintenance methods regarding construction equipment

Maintenance works are being done both in their own shops and at the job sites in field. Major works are asked to be done in the dealers because of shortage of the required spare parts in the regional parts warehouse, even in the central warehouse. They rely on the dealers such as Ries engineering, MOENCO, AMCE, Nyala motors, Tana eng., etc. Each workshop does not have enough spare parts in stock because of their financial reason. They manufacture the necessary parts by themselves if the parts can be made. The machine availability, therefore, remains to be low and their awareness toward improving the availability is low, too.

3. Progress control and quality control

According to the responses to the questionnaire, it seems that all organizations understand the importance of quality control. They conduct the simple tests and easy tests by themselves and they conduct tests other than above as an outsourcing. The main outside organization that conducts tests is Transport Construction Design Enterprise (TCDE) in general. On the other hands, it seems that almost all the organization do not understand the importance of progress control. The quality control is carried out for the reason that there is a regulation regarding it. But the progress control is not carried out for the reason that there is not regulation regarding it. Moreover the insufficient number of equipment and logistic problem on material make light of the progress control.

4. Incentives

4-1 General

Although there are some basic incentives such as health insurance or per diem system, in general, particular incentive schemes do not exist in both governmental organizations and general contractors. However, one private company that responded to the survey gives incentives to their workers by offering a bonus.

4-2 Public sector

not particularly

4-3 Private sector

There are incentives such as promotion according to their job performance and offering bonus in some general contractors.

5. Training system for employee

In general, no particular in-house training systems exist in both governmental organizations and private companies.

6. Certificate

There is not their own certificate system for professionals.

Their understanding is that AT&TC is the only institution which can issue the certificate in terms of construction equipment operation, in either event whether they think the certificate is valuable or not.

7. Needs for the training at AT&TC and other training institute

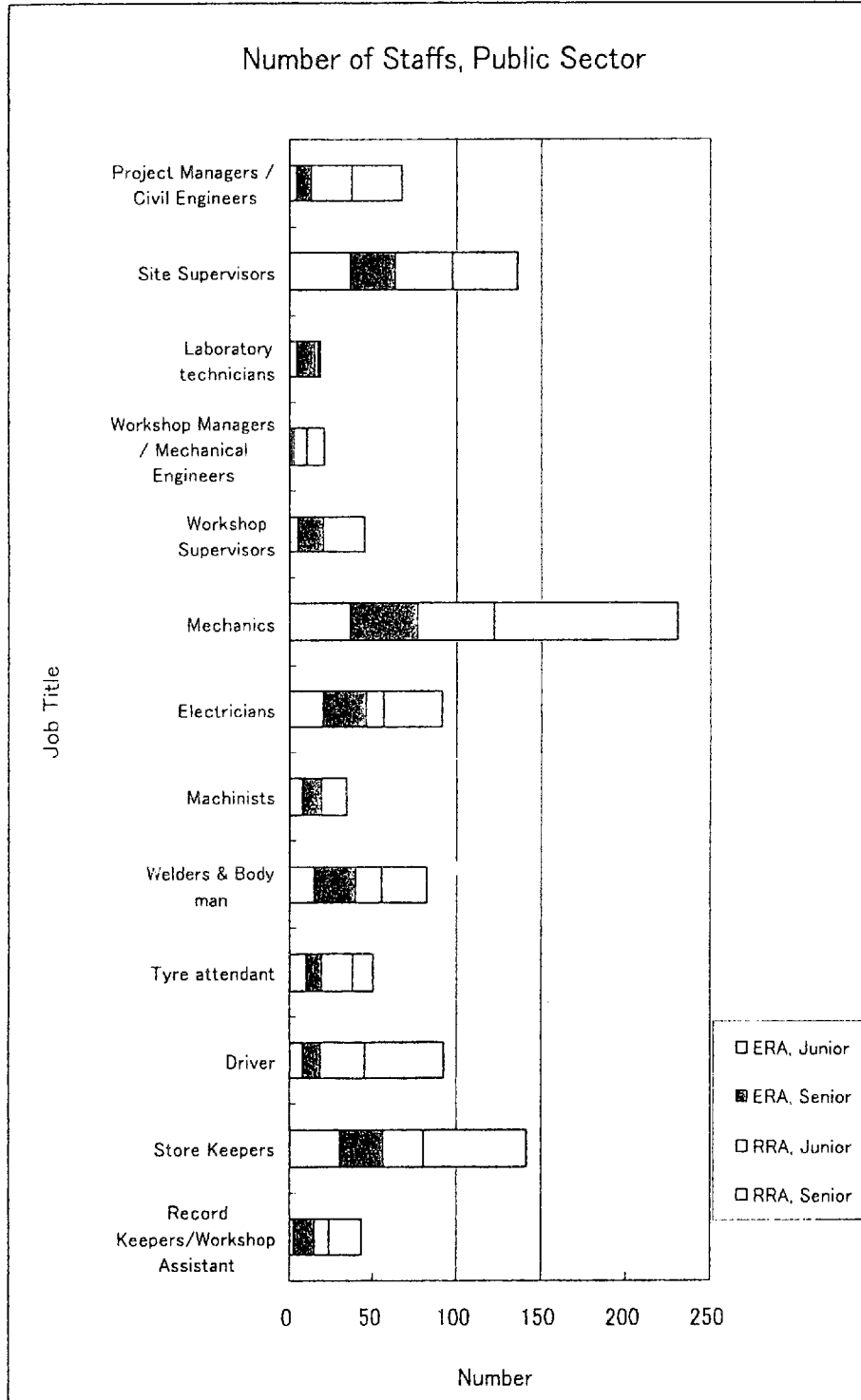
In general, public sector, such as ERA and RRA feel that the trainings are necessary for their employees, especially for operators and mechanics. However, they express concern over the training fee. On the other hand we didn't get any demand for the training of their employee from the general contractors in general.

8. Textbook

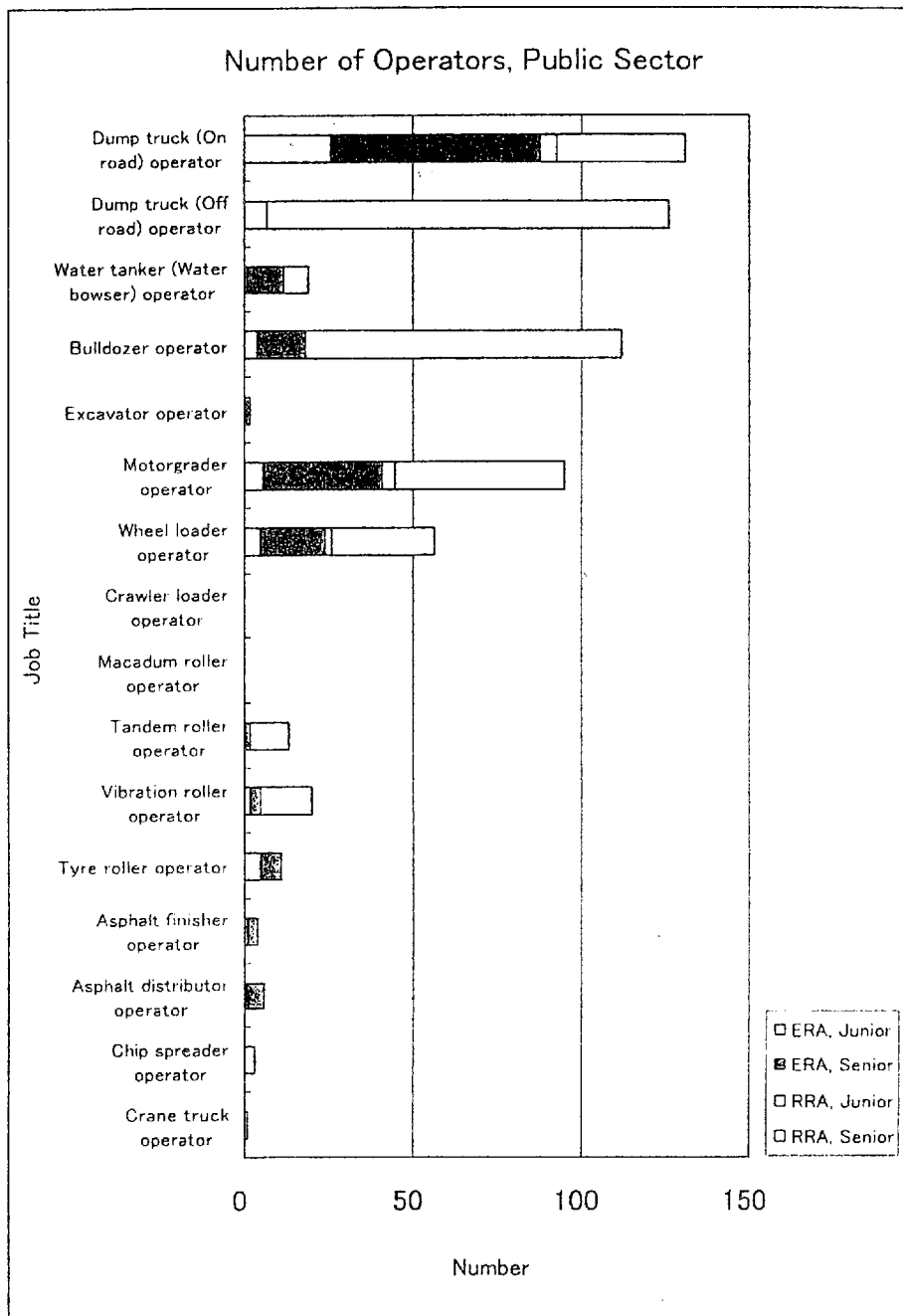
Textbooks are supposed to be written by both English and Amharic. And also there are little demand for textbooks in Oromo language.

9. Personnel

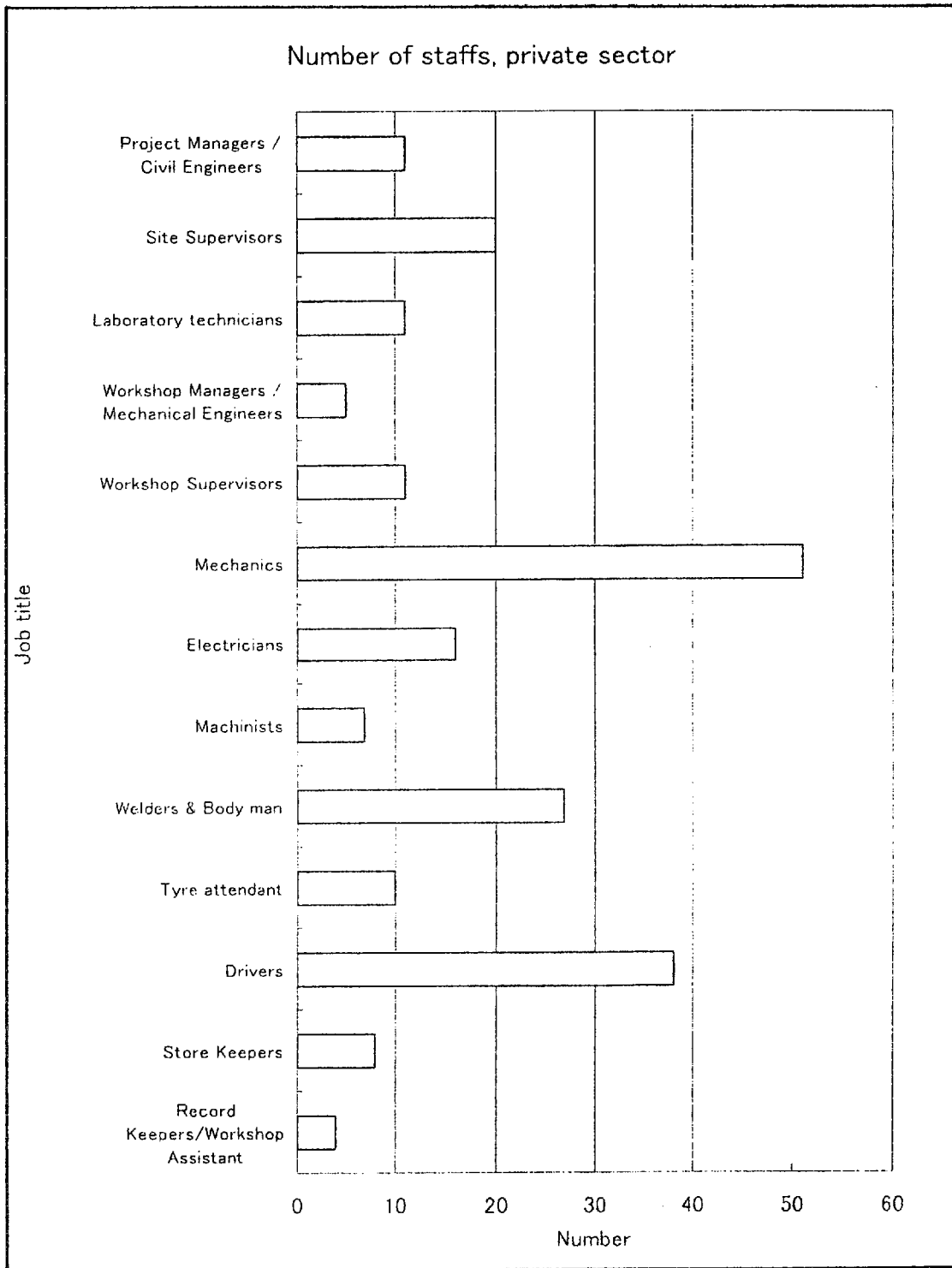
In general, there are shortages in the specialties of project manager, laboratory technician, surveyor, workshop manager, mechanic, electrician, welder, and construction equipment operator. Moreover not only the number of staffs, but also the knowledge and skill level is the serious problem.



Note: The data above are on 5 districts of ERA.

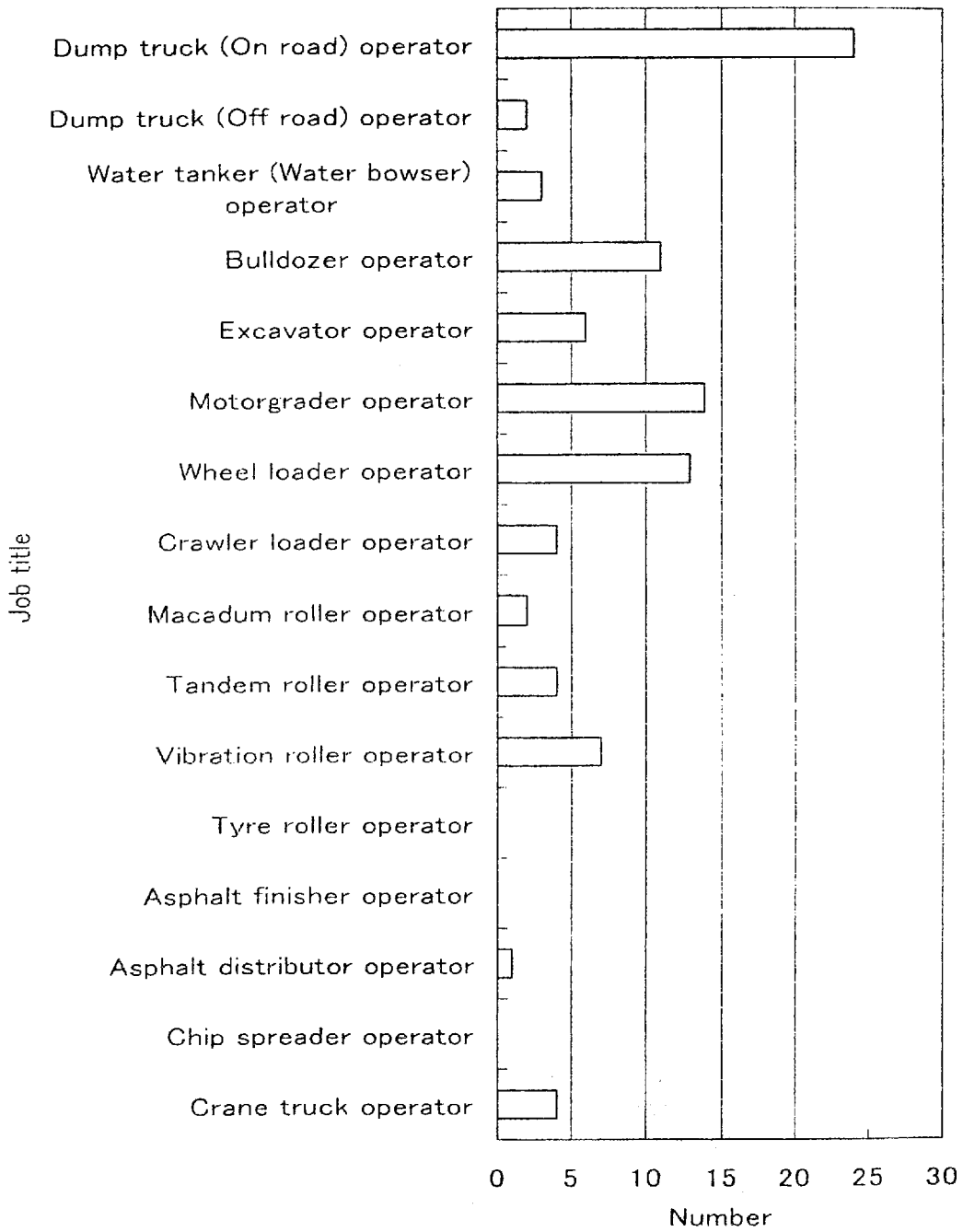


Note: The data above are on 5 districts of ERA.



Note: The data above are on 3 contractors.

Number of Operators, Contractor



Note: The data above are on 3 contractors

10. Construction equipment

10-1 Construction Equipment

10-1-1 General

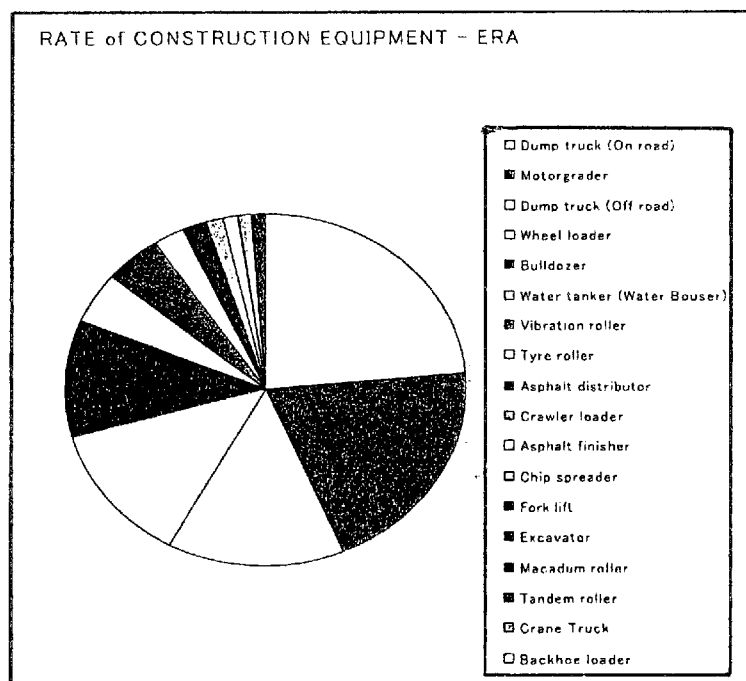
According to the responses for the questionnaire, the number of bulldozers, motor graders and dump trucks, which are fundamental road construction equipment, of ERA, RRA and general contractors are large than that of other construction equipment. In addition, the most common types of rollers are vibration rollers. Perhaps this is because of that ERA, RRA and general contractors are not able to own various types of rollers due to the limited budget.

They do not have asphalt-related machineries, because of gravel road is the main for them to maintain. This survey is focused in road construction and maintenance, however it seems that the number of excavators which can be used for various construction works is small.

10-1-2 Public Sector

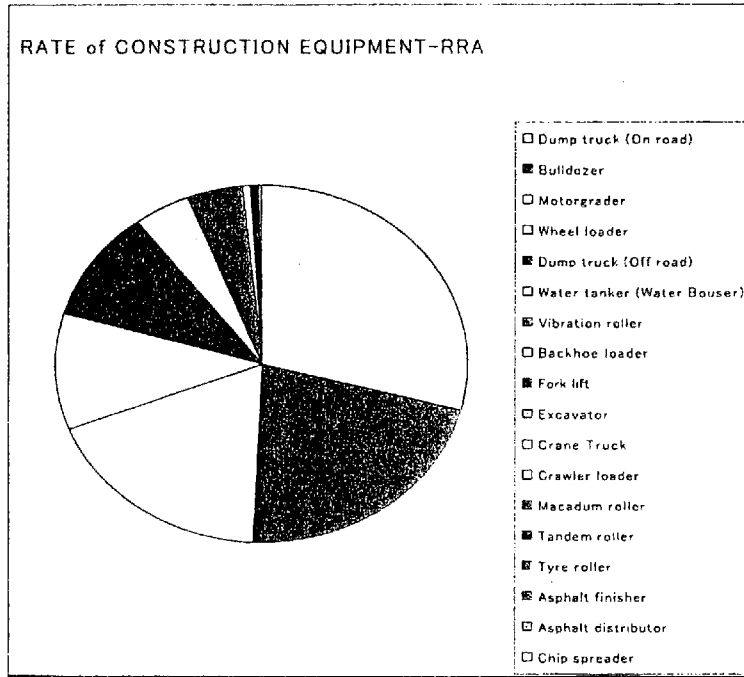
In comparison with ERA district office, there are more number of construction equipment in RRA. But the type of construction equipment owned by RRA is almost the same.

As for the public sector, the availability of construction equipment seems to be low anyway. It seems that only less than half of the existing construction equipment is available. It is obvious that the causes are insufficient budget and spare parts availability. In addition, there are also another causes of the low availability of construction equipment that we have

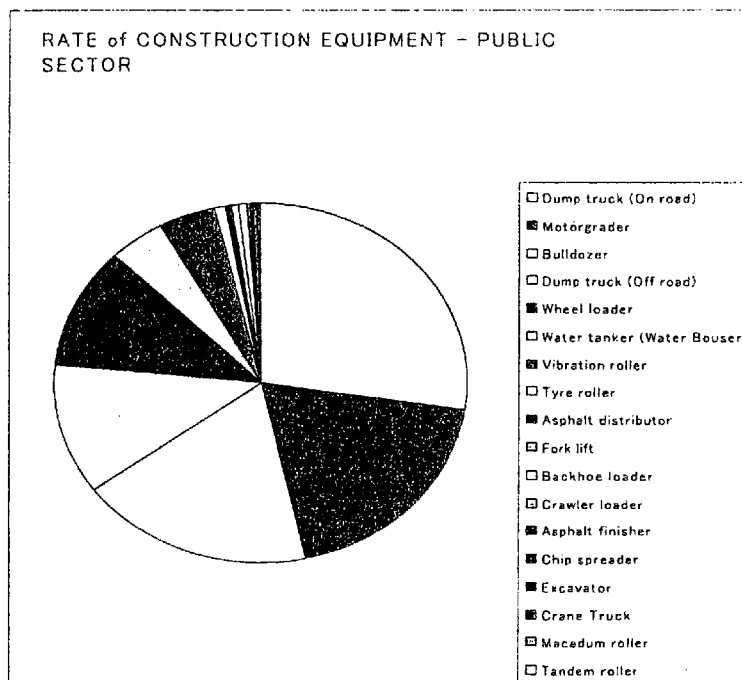


Note: The data above are on 5 Districts of ERA

to be careful, which is insufficient operator's skill. If operators are able to control construction equipment properly and to check construction equipment correctly, it seems that availability of construction equipment becomes higher than present situation. So, in designing the new training courses for operators, giving the ability of proper operation of construction equipment and correct checking of construction equipment must be considered.

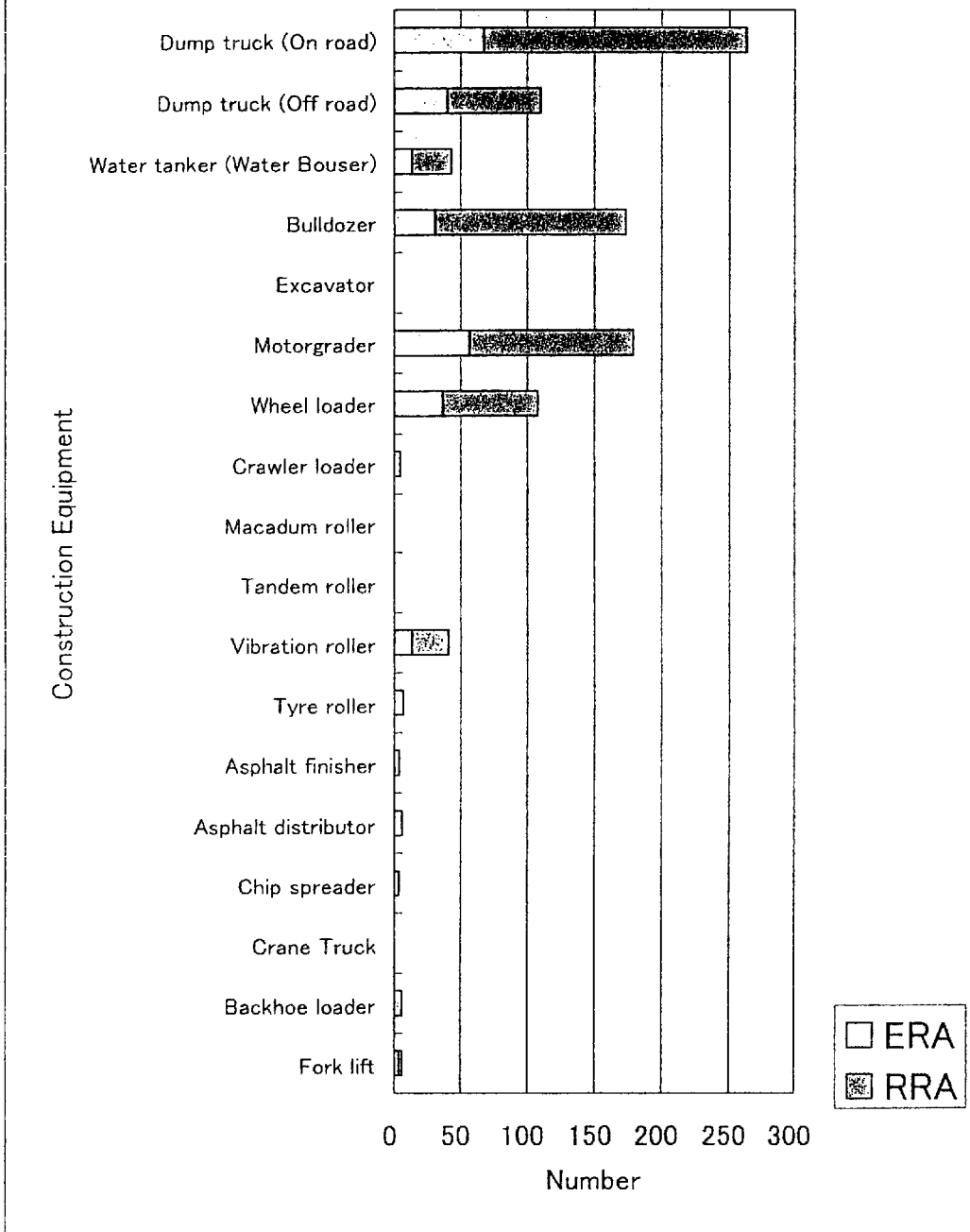


Note: The data above are on 3 RRAs



Note: The data above are on 5 Districts of ERA & 3RRAs

Number of Construction Equipment – Public sector

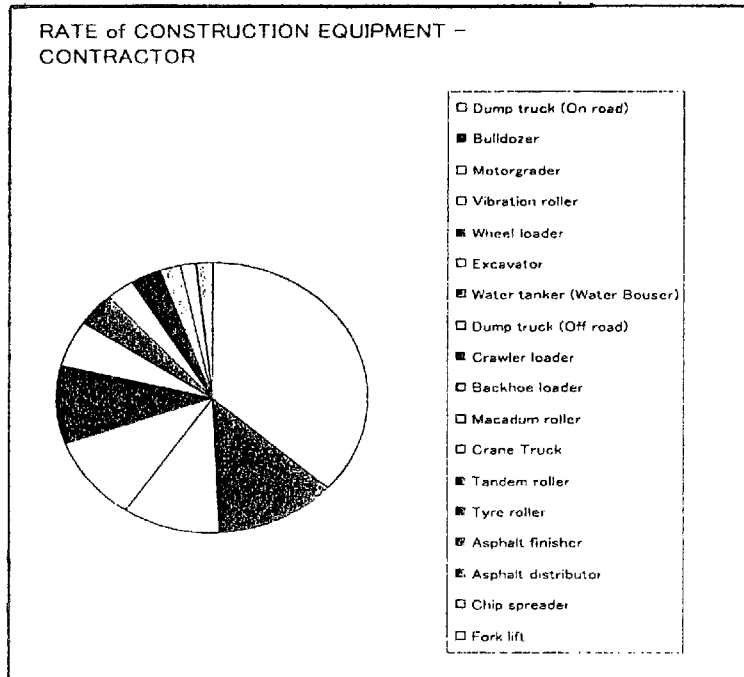


Note: The data above are on 5 Districts of ERA & 3 RRAs

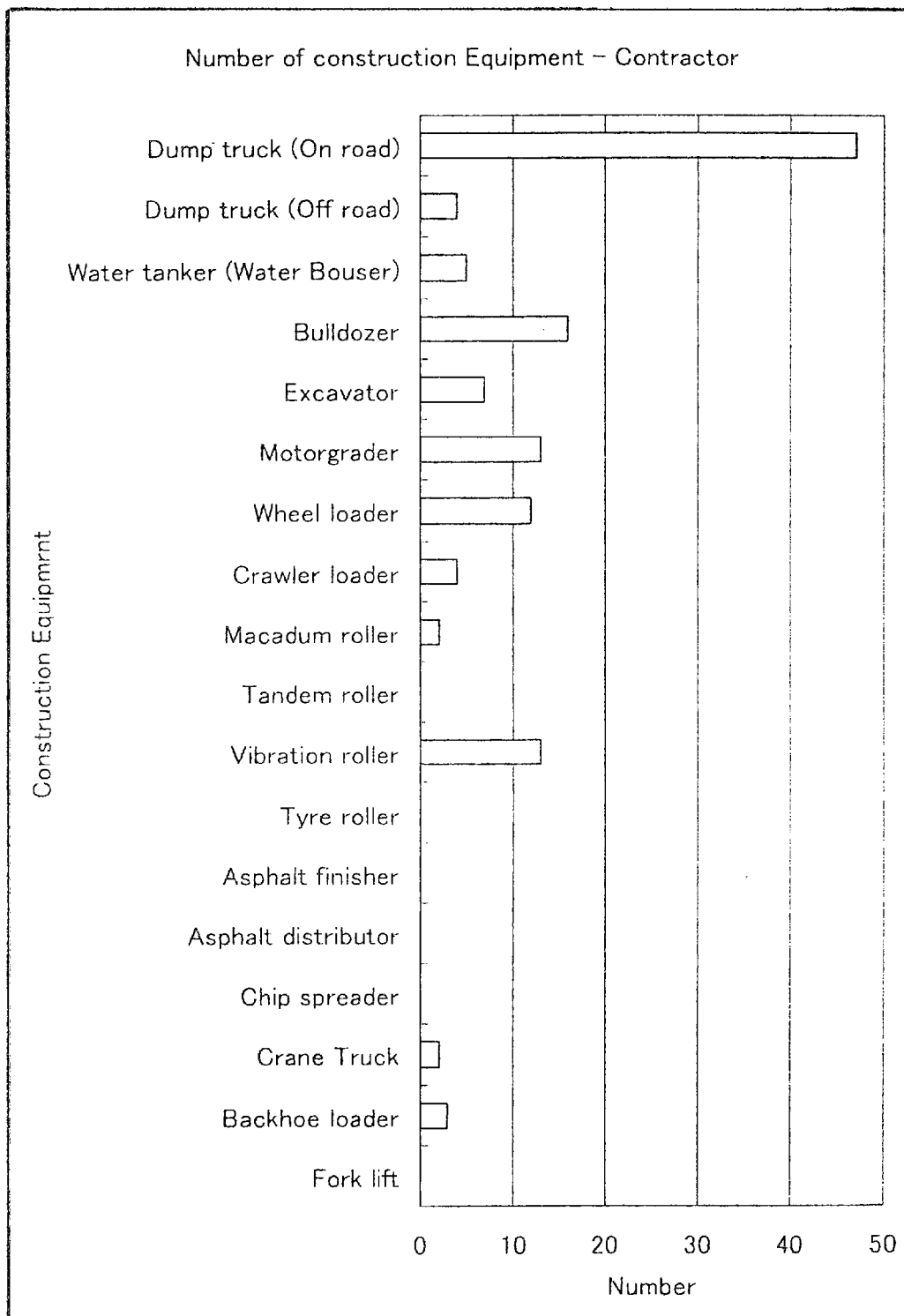
10-1-3 Private sector

Private sector's construction works are not limited to road construction. So general contractors have more various type of construction equipment such as excavators, crane trucks and backhoe loaders, the complex equipment of excavator and loader, than public sector.

As to the construction equipment availability, it seems that it is not so low like public sector.



Note: The data above are on 3 contractors.



Note: The data above are on 3 contractors.

10-2 Construction equipment maintenance equipment

Preparation/availability of maintenance equipment varies workshop by workshop. Most of managers in workshops understand they don't have enough tools and equipment. It is a very important theme to conform the training contents in Alemgena with the preparedness of tools and equipment in each ERA/RRA workshop, and vice-versa.

10-3 Construction material testing equipment and other equipment regarding road construction / maintenance

The district offices of ERA and RRA don't have enough testing equipment for supervising in general. But even if there were equipment for supervising, there is a doubt whether the equipment is used properly.

11. Problems

11-1 Problems regarding construction equipment operation

11-1-1 General

It is necessary for the operators to have knowledge on the construction equipment that they operate. However, it seems that, for the Ethiopian operators, knowledge on construction equipment is insufficient in general. This means that it causes the frequent trouble and the shortening of the life span of the construction equipment. Because these are caused by the reason that not only the operators are not able to do the daily maintenance that is the obligation for the operators, but also they are not able to operate the equipment efficiently and effectively.

The knowledge on the construction equipment is essential for the operators, therefore, in designing the new training courses, the subject regarding the knowledge on construction equipment is necessary and is one of the main subject.

11-1-2 Public sector

As the proper maintenance cannot be carried out by the insufficient maintenance facilities and spare parts, it seems that this problem reduces the effectiveness of construction equipment operation. In addition, as the ability and knowledge level of operators is low in general, they cannot control effectively and it seems that they break equipment quite often. Therefore trainings, giving them a proper knowledge and a skill, are necessary for operators.

Moreover, there are many operators working without certificate in district offices. These problems should be solved as soon as possible.

11-1-3 Private sector

Low spare parts availability due to the insufficient budget reduces the effectiveness of construction equipment operation as same as public sector. In addition, there is a problem of the supplier side about the spare parts such as price, system etc.

Moreover insufficient ability and knowledge of some operators are also a serious problem. Therefore the providing of good operators to the market is an urgent matter for the project because the general contractors in Ethiopia employ workers, such as construction equipment operators, from the market if necessary.

11-2 Problems regarding construction equipment maintenance

Priority of training needs of being able to do the right maintenance work in shop and field is very high according to the managers in every workshop. In addition, they pointed out the following problems and they are all very significant ones for them.

- Shortage of tools and equipment
- Shortage of the training with the introduction of new models
- Shortage of the training to improve the efficiency of maintenance work
- Low productivity result from much downtime because of being a lot of old age machines
- Necessity of training program on the basic maintenance and exchanging lubricants
- Shortage of the skilled engineers and mechanics
- Difficulty of scheduling the repair and maintenance work due to shortage of spare parts
- Workers do not want to go to work in field
- High cost of spare parts
- Difficulty of stable employment of skilled mechanics
- Shortage of documentations
- Workers do not observe the instructions even if the documentations exist. They prefer to keep their traditional way.

Each workshop faithfully observes the training program, "Trades & Crafts", which was introduced here by the consultant, Roy Jorgensen Ass., about 40 years ago, and there has not been a progress from it. Mechanic related part in each workshop has been organized as "Equipment Maintenance Services Branch", and includes the following sections based on the foregoing training program.

- Equipment Mechanic
- Equipment Electrician
- Machinist
- Welder
- Carpenter

All the regional workshops comprise each above-mentioned section, and a working area

and/or a room of each section is prepared respectively. Its constitution is the same as that of any other workshop, and therefore it is apparent that the introduction of "Trades & Crafts" here in the past was made in the scale of through-the-country (ERA, RRA).

Machines which we could see in every shop bay were always trucks and automobiles, and it seems that the opportunity of handling the heavy construction machinery actually is not so high. Curricula of the equipment mechanics course in Alemgena training center are also of the trucks and automobiles, and those are recognized as the fundamental contents which can be applied into the heavy construction machinery.

Managers in every workshop pointed out the training needs of learning the right maintenance work as well as the repair technique.

As a content of the new Technician course from next April, it is considered to meet the actual needs to provide the basic knowledge of structures of bulldozer and motor-grader, and their practical work of maintenance in addition to the existing basic course curricula.

11-3 Problems regarding construction work site supervision

As responses to the questionnaire regarding the construction work site supervision, most of organizations answered that problems were insufficient workers' skill and lack of tools. But as there are a lot of potholes and cracks in the present roads in Ethiopia, it seems that the most serious problem regarding supervision is that the supervisors do not have enough knowledge, skills and experiences on road construction work and road maintenance work. So, in designing the new training course, giving trainees the knowledge and skills on road construction work and road maintenance work to solve the problem should be the main subject.

12. Management

12-1 Construction equipment management

12-1-1 General

There is an in-house registration system not only for the construction equipment but also for all the property in general. In addition, they know the present conditions of the construction equipment. But the system is not yet computerized. Besides an operator's or mechanic's report on construction equipment is done mainly orally instead of written report.

12-1-2 Public sector

The construction equipment has their own each registered number, and the each construction equipment is controlled by each peculiar number.

In addition, in some workshop of the district office there is a signboard that shows the current situation of the construction equipment. However analysis on failures and the other problems regarding construction equipment is impossible, because there is not a daily operation report.

In addition, according to the response to the questionnaire there is a disposal system of construction equipment, but it seems that the system is not functioning well. The reason is that there are many scraps, called spare parts, in the factory backyard.

12-1-3 Private sector

The present status or data on construction equipment is available in the manager's office, so there is a management system for construction equipment. And it seems that they have a system of the purchase, sale and the disposal, because they frequently sell their equipment. However, in general contractors also, computerization is not yet done in this field.

12-2 Tool & spare parts management

Although they answer the system exist, they add it is not well-organized and/or is of partial use.

Computerization of the systems is not completed yet in any workshop.

As for the inventory control in parts warehouses, the introduction of computer use has been tried and under way.

Basic system is not established that the control of tools and parts maintenance is a job of the superintendent and workers must pay attention to the control in shop and field and report it to the superintendent. Awareness must be strengthened that poor tools and inadequate facilities not only provide low efficiency, but also poorly maintained machinery are dangerous.

The kinds, quantity and quality of tools must be carefully selected by each workshop circumstances, and spare parts stock must be also carefully checked according to the specification difference due to manufacturing year even if they are of the same model. And, as to tools management and spare parts stock environment, it seems to be a room to be improved.

Chapter 3 Conclusion

The result of the survey is not satisfactory. The reason is suppose to be like following:

1. The questionnaire forms were not proper to fill in.
2. There are quite a few personnel in ERA or RRA who have a capability to respond the questionnaire like this, in other word personnel in ERA or RRA are not accustomed to this kind of questionnaire.
3. Training in AT& TC is not interesting or training for employees is not interesting, particularly for the private sector.
4. There was no data as to the questionnaire in the district office of ERA or RRA.
5. There were no incentives for the interviewee to respond the questionnaire.
6. Selection of interviewees was not correct.
7. We didn't have enough experience on this kind of survey in Ethiopia.

So, the next research such as "Training Needs Analysis" must be designed and executed carefully based upon this experience.

But, unfortunately it is clarified that there is almost no training needs from private sector currently.

Lastly, we are sure that we have already got enough amounts of data for designing new training courses, so that the new training courses will commence from coming April.

Annex

1. Methods

To know the current situation of ERA District Office, RRA and the general contractors in Ethiopia regarding construction equipment operation, construction equipment maintenance and road construction and maintenance supervision, both the Ethiopian counterparts and Japanese experts visited the offices.

At the office, we interviewed responsible person and asked to fill in the questionnaire at the same time.

But incase the responsible person cannot fill the questionnaire form, we explained the purpose of the project and how to fill in the questionnaire and asked to send it to the AT&TC.

Almost all, the responsible person were not able to fill in the questionnaire then.

The questionnaire we used is shown as Annex 2. Questionnaire.

When we visited the offices, we looked the workshops to know the present situation too.

Besides, to strengthen the contents of the response to the questionnaire, we visited the Ministry of Capacity Building and the Ministry of Infrastructure and got the necessary data as a part of the investigation.

Moreover, we got the data on number of staffs related to the training target from the headquarters of ERA to strengthen the data we collected from the District Office of ERA.

Schedule

The following table shows the date which we visited on.

Date	Office
16-Jul-02	REIS ENGINEERING
18-Jul-02	MOENCO
31-Jul-02	Oromia RRA
2-Aug-02	Contractors' Association
6-Aug-02	Shashamane District
7-Aug-02	Southern People Adm. RRA
8-Aug-02	Sodo District
14-Aug-02	Alemgena District
19-Aug-02	Debre Markos District
21-Aug-02	Amhara RRA
22-Aug-02	Gonder District
17-Sep-02	Nekemte District
18-Sep-02	Jima District
22-Oct-02	Dire Dawa District
23-Oct-02	Harare RRA
11-Nov-02	Komborcha District
13-Nov-02	Tigray RRA
14-Nov-02	Adigrat District
29-Nov-02	Blue Nile Constroction
4-Dec-02	Sunshine Construction

2. Questionnaire Form

The Project for Capacity Building of the ALEMGENA Training and Testing Center of ERA

SURVEY ON UTILIZATION AND MAINTENANCE OF CONSTRUCTION EQUIPMENT IN ETHIOPIA

SURVEY ON ROAD CONSTRUCTION AND MAINTENANCE IN ETHIOPIA

Interviewer: _____

Date: _____

1. DETAILS OF ORGANIZATION, COMPANY etc.

1.1 Name of the organization:

1.2 Your name / name of the contact person for future correspondence:

1.3 Address (P.O.Box) : _____

1.4 Telephone number / Fax number: _____

1.5 Nature of business:

Ethiopia roads authority

Rural roads authority

Construction company (Foreign)

Construction company (Ethiopian)

Construction equipment dealer

Construction equipment maintenance company

Consultant (Foreign)

Consultant (Ethiopian)

Training institute

1.6 Total number of employee: _____

1.7 Total number of Technical(Engineering) person: _____

1.8 Staff Details

		Number			Remarks
		Junior Level	Senior Level	AT&TC Graduates	
1	Project Managers / Civil Engineers				
2	Site Supervisors				
3	Laboratory technicians				
4	Surveyors				
5	Draftsmans				
6	Workshop Managers / Mechanical Engineers				
7	Workshop Supervisors				
8	Mechanics				
9	Electricians				
10	Machinists				
11	Welders				
12	Tyre attendant				
13	Construction Equipment Operators				
13-1	Dump truck (On road)				
13-2	Dump truck (Off road)				
13-3	Water tanker (Water bowser)				
13-4	Bulldozer				
13-5	Excavator				
13-6	Motorgrader				
13-7	Wheel loader				
13-8	Crawler loader				
13-9	Macadam roller				
13-10	Tandem roller				
13-11	Vibration roller				
13-12	Tyre roller				
13-13	Asphalt finisher				
13-14	Asphalt distributor				
13-15	Tip spreader				
13-16	Crane truck				
14	Drivers				
15	Computer operators				
16	Helper, Worker				
17	Administration				
17-1	General affairs				
17-2	Account				
17-3	Store Keepers				
17-4	Record Keepers / Workshop Assistance				

1.9 Incentives

What kind of incentives are there?

- Licence
- Certificate of training
- Job performance

1.10 Construction Equipment Details

		No. of Present	Availability	No. of Future Plan
1	Dump truck (On road)			
2	Dump truck (Off road)			
3	Water tanker (Water Bouser)			
4	Bulldozer			
5	Excavator			
6	Motorgrader			
7	Wheel loader			
8	Crawler loader			
9	Macadam roller			
10	Tandem roller			
11	Vibration roller			
12	Tyre roller			
13	Asphalt finisher			
14	Asphalt distributor			
15	Tip spreader			
16	Crane Truck			
17	Backhoe loader			
18	Fork lift			

2. NUMBER OF INSUFFICIENT STAFF AND RECRUITING PLAN IN NEAR FUTURE

		Number		Remarks
		Junior Level	Senior Level	
1	Project Managers / Civil Engineers	/	/	
2	Site Supervisors	/	/	
3	Laboratory technicians	/	/	
4	Surveyors	/	/	
5	Draftsmans	/	/	
6	Workshop Managers / Mechanical Engineers	/	/	
7	Workshop Supervisors	/	/	
8	Mechanics	/	/	
9	Electricians	/	/	
10	Machinists	/	/	
11	Welders	/	/	
12	Tyre Attendant	/	/	
13	Construction Equipment Operators	/	/	
13-1	Dump truck (On road)	/	/	
13-2	Dump truck (Off road)	/	/	
13-3	Water Tanker	/	/	
13-4	Bulldozer	/	/	
13-5	Excavator	/	/	
13-6	Motorgrader	/	/	
13-7	Wheel loader	/	/	
13-8	Crawler loader	/	/	
13-9	Macadam roller	/	/	
13-10	Tandem roller	/	/	
13-11	Vibration roller	/	/	
13-12	Tyre roller	/	/	
13-13	Asphalt finisher	/	/	
13-14	Asphalt distributor	/	/	
13-15	Tip Spreader	/	/	
13-16	Crane Truck	/	/	
14	Drivers	/	/	
15	Computer operators	/	/	
16	Helper, Worker	/	/	
17	Administration	/	/	
17-1	General affairs	/	/	
17-2	Account	/	/	
17-3	Store Keepers	/	/	
17-4	Record Keepers / Workshop Assistance	/	/	

5. PROGRESS CONTROL AND QUALITY CONTROL (ONLY FOR CONSTRUCTION COMPANY)

5.1 What kind of control regarding construction work you deal ?

Progress control

Quality control

Internal (Detail of quality control you deal in-house)

External (Detail of quality control and the company)

6. PROBLEMS IN YOUR ORGANIZATION, COMPANY etc.

6.1 Construction equipment operation

Main problem regarding construction equipment operation in your company

Cause

Fund shortage

Skill shortage, trained personnel

Construction equipment maintenance facility shortage

Spare parts availability

Lack of information

6.2 Problems of construction equipment maintenance

Main problem regarding construction equipment maintenance in your organization, company etc.

Cause

- Fund shortage
- Skill shortage, trained personnel
- Tool shortage
- Construction equipment maintenance facility shortage
- Spare parts availability
- Lack of information

6.3 Problems of Construction work site supervision

Main problems regarding construction work site supervising in your company, organization

Cause

- Fund shortage
- Skill shortage, trained personnel
- Tool shortage
- Lack of information

7. MAIN CONSTRUCTION EQUIPMENT MAINTENANCE EQUIPMENT

	Maintenance Equipment	Number of Equipment	Remarks Maker
1			
2			
3			
4			
5			

8. MAIN CONSTRUCTION MATERIAL TESTING EQUIPMENT AND OTHER EQUIPMENT REGARDING CIVIL ENGINEERING

8.1 Equipment & tool regarding civil engineering

- Total Station
- Transit
- Level
- Schmidt hammer
- Thermometer
- Rain gauge

8.2 Material Testing Equipment

	Material Testing Equipment	Number of Equipment	Remarks Maker
1			
2			
3			
4			
5			

9. CONSTRUCTION EQUIPMENT MANAGEMENT

- System exists Yes No
- Record keeping Yes No
- Cost evaluation system Yes No
- Disposal system Yes No
- Computerized Yes No

10. TOOL MANAGEMENT

- System exists Yes No
- Store control (Inventory control) Yes No
- Computerized Yes No

11.SPARE PARTS MANAGEMENT

- System exists Yes No
- Stock control (Inventory control) Yes No
- Computerized Yes No

12. TRAINING SYSTEM FOR EMPLOYEE

12.1 Training system exists Yes No

12.2 What kind of training methods

- In-house training
- Guided OJT
- External training programmes(Domestic) (Institute)
- External training programmes(Foreign) (Institute)
- Others ()

12.3 What kind of course or for what kind of personnel those course are?

	Target Personnel	Training Level			Remarks
		Junior Level	Senior Level	AT&TC Graduates	
1	Project Managers / Civil Engineers				
2	Site Supervisors				
3	Laboratory technicians				
4	Surveyors				
5	Draftsmans				
6	Workshop Managers / Mechanical Engineers				
7	Workshop Supervisors				
8	Mechanics				
9	Electricians				
10	Machinists				
11	Welders				
12	Tyre attendant				
13	Construction Equipment Operators				
13-1	Dump truck (On road)				
13-2	Dump truck (Off road)				
13-3	Water tanker (Water bowser)				
13-4	Bulldozer				
13-5	Excavator				
13-6	Motorgrader				
13-7	Wheel loader				
13-8	Crawler loader				
13-9	Macadam roller				
13-10	Tandem roller				
13-11	Vibration roller				
13-12	Tyre roller				
13-13	Asphalt finisher				
13-14	Asphalt distributor				
13-15	Tip spreader				
13-16	Crane truck				
14	Drivers				
15	Computer operators				
16	Helper, Worker				
17	Administration				
17-1	General affairs				
17-2	Account				
17-3	Store Keepers				
17-4	Record Keepers / Workshop Assistance				

12.4 Job-related training to newcomer exists

Yes No

13.CERTIFICATE

13.1 Own certificate exists Yes No

13.2 Opinion about national liscence, certificate etc

14.PROBABILITY OF SENDING TRAINEE TO AT&TC Yes No

15. EXPECTATION FOR AT&TC OR OTHER EXTERNAL TRAINING INSTITUTE

Have Yes No

If Yes, describe the details of training needs

Course contents	Level	Language	Duration/ Season	Expected No.of trainees	Maximum Charge

16.TEXTBOOK

If the AT&TC's textbooks were for sale,

Are there any probabilities to purchase them?

Language Amharic English Others

Maximum Price Birr25 Birr 50 Birr 100 Birr 150 Birr 200

	1	2	3	4																						
				No. of repair during latest 3 years																						
	No. of machines you own	No. of machines plan in future	No. of machines under work now	Engine	Turbocharger	Electrical system	Fuel system	Plywheel clutch	Torque converter	Transmission	Hydraulic pump	Power train	Starting system	Brake system	Final drive	Differential	Hydraulic motor	Undercarriage	Tyre & wheel	Hydraulic system	Tool attachment	Others (Please describe the component)				
Heavy Con. Eq.	Skidder Loader																									
	Log Skidder																									
	Fork Lift																									
	Excavator																									
	Dump Truck																									
	Dozer																									
	Grane																									
	Loader																									
	Backhoe Loader																									
	Water Pump																									
Light Con. Eq.	Tamper																									
	Poker Vibrator																									
	Plate Compactor																									
	Concrete Mixer																									
	Boom Truck																									
	Baby Dumper																									
	Air Compressor																									
Road Con. Eq.	Road Roller																									
	Paver																									
	Power Trowel																									
	Emulsion Sprayer																									
	Motor Grader																									
	Batching Plant																									
	Asphalt Paver																									
	Asphalt Cutter																									
	Weiding Plant																									
	Truck Mixer																									
Others	Tipper Truck																									
	Prime Mover																									
	Piling Machine																									
	Generator																									
	Farm Tractor																									
	Concrete Pump Car																									
	Concrete Braker																									
	Concrete Pump																									
	Water Tanker																									

3. Response

The following data and tables have been arranged from the original response.

And when making arrangement, the effort to be same as original was most important.

Therefore there might be a few mistakes from the cause such as misunderstanding of interviewee, not enough explanation by the project, lack of English capability etc.

1) Target of the survey

Public	Number	Organizations						
ERA	10 districts							
RRA	5 authorities	Tigray	Amhara	Harare Rural	Oromia Rural	South Rural		
Private								
Contractor								
Foreign	2 companies	China Bridge and Road Construction	J & P / DRAGADO S Joint Venture					
Domestic	7 companies	Sur Construction	Satcon constructio	Luigi Varneero	Sunhine Construction	Safe construction	Medroc Ethiopia	African Eng. & Const.
G.E. Dealer	2 companies	Reis Engineering	MOENCO					

Remarks : CE = Construction Equipment

2) Response rate

Public	No.	%	Organization						
ERA, District	7	70	Alemgena	Debra markos	Dire Dawa	Gonndar	Jimma	Shashemene	Solo
RRA	4	67	Amhara	Harare	Oromia	South			
Private									
Contractor									
Foreign	0	0							
Domestic	3	43	BERTA CONSTRUCTION PLC	BLUE NILE CONSTRUCTION S.C.(Interview)	SUNSHINE CONSTRUCTION S.C.(Interview)				
C.E. Dealer	1		Reis Engineering						

3) Publicity level of AT&TC

PUBLIC	ERA District	<div style="display: flex; justify-content: space-around; text-align: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Construction equipment operator training</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Construction equipment mechanic training</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Construction work supervisor training</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Welder training</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Electrician training</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Machinist training</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Issuing the certificate for the construction equipment operator</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Others</div> </div>							
		RRA	3	2	3	2	2	2	3
PRIVATE	Contractor	3	0	1	0	0	0	1	0

Note: Number means number of offices

4) Maintenance methods regarding construction equipment

		What kind of job do you deal as an in-house maintenance?			What kind of job do you deal as an external maintenance?	
		Site job	Workshop job	Others	Dealer	Others
PUBLIC	ERA District	6	6	1	2	2
	RRA	3	3		3	2
PRIVATE	Contractor	2	3		0	2

Note: Number means number of offices

What kind of job do you deal as an external maintenance ?

Dealer Contracting local dealers of Equipment (ERA)

Major engine overhaul because lack of spare parts in our central warehouse & District warehouse (ERA)

Ries engineering, MOENCO, Maksheb, etc (RRA)

RIES Engineering, MOENCO, AMCE, NYALA MOTORS, Tana Eng etc. (RRA)

Others Specialized works like calibration, modeling and fabrication of contact seats (ERA)

Private garage (RRA)

Private workshop (RRA)

5) Progress control and quality control

		What kind of control regarding construction work you deal ?				
		Progress control	External	Quality control	Internal	External
PUBLIC	ERA District	3	0	3	1	1
	RRA	3	1	2	1	2
PRIVATE	Contractor	1		3	2	2

Note: Number means number of offices

What kind of control regarding construction work you deal ?

Internal (Detail of quality control you deal in-house):

As far as quality control is concerned, there is no test conducted except graduation of asphalt aggregate on the crusher plant. (ERA)

Quality & construction material (ERA)

mms, and CMS Progress Report. (Dail, Monthly and Quarterly Report) (ERA)

Subgrade, base, subbase control & Testing (RRA)

Aggregate, Sand & Rock Testing & control (RRA)

Mix design Test, Concrete strength, Moisture content (RRA)

Respective divisions (Construction, design, maintenance and contract administration) Conducting different laboratory tests. (RRA)

External (Detail of quality control and the company):

Out of the district tests Send to TCDS for Quality tests and Design. (ERA)

Reinforcement bar testing (RRA)

Cement Quality test (RRA)

Through consultant hiring, construction and design ?????? the Region. (RRA)

6) Incentives

		License	Certificate of training	Job performance
PUBLIC	ERA District			2
	RRA			1
PRIVATE	Contractor			2

Note: Number means number of offices

7) Training system for employee

		In-house training	Guided OJT	External training programmes(Domestic)	External training programmes(Foreign)	Others	Job-related training to newcomer exists
PUBLIC	ERA District	4	1	5	3	0	3
	RRA	1	1	1	1	0	0
PRIVATE	Contractor	0	0	0	0	0	0

Note: Number means number of offices

8) Needs for the training at AT&TC and other training institute

		Course contents	Level	Language	Duration/ Season	Expected No of trainees you send	Maximum Charge	
ERA District	Alemgena	Laboratory technician	Senior	English	6th month	2		
		Operators (Grader, Dozer, Excavator)						
	Debra markos	Shop supervisors	Jur/Sen	English	At any season	5		
		Equipment Inspector	/Sen	"	At any season	1		
		Technicians	Jur/Sen	Amh+Eng	At any season	20		
		Equipment operators	Jur/Sen	Amh+Eng	Raining Season	12		
	Dire Dawa	No Response						
	Gonder	Yes						
	Jimma	Management (Human resource personnel project)	I higher	English	6Months	3		
		Computer operation	I higher and lower	English	6Months	10		
	Shashemene	Time Report; Pavrol Preparation	Junior	English	Feb-03	3		
		Accounting Procedure	Junior			3		
		Office Procedures	Senior		Mar-03	2		
		Auto-mechanics	Junior			10		
Auto-electricity		Senior			10			
	Ware hesity	Senior	English	May-03	4			
Sodo	No Response							
RRA	Amhara	Roads & Bridge construction & Different construction materials test	Junior and senior	English	4 month			
		Engineers & Officers Technical Staff	Junior and senior	English	3 month			
		Skoupradity courses Mechanical & related	Junior and senior	Amharic and English	3 month			
		Differnt operators (Equipment)	Junior and senior	Amharic and English	3 month			
		Administration, Planning & accounting	Junior and senior	Amharic and English	3 month			
	Harare	Construction foreman	Junior	Amharic or English	3 Months	2		
		Grader, Roller, Loader Operator	Junior	Amhari	3 Months	3		
		Surveying	Junior	English	3 Months	2		
		Labour Intensive Road Construc	Junior	English	3 Months	2		
	Oromia	Equipment management system	Senior	English	Varies	43	250/Person	
		Equipment maintenance system	Senior	English	Varies	63	250/Person	
		Trouble shooting	Senior and Junior	English	Varies	59	100/person	
		Providing certificate	Senior and Junior	English	Varies	919	300/person	
		Maintenance planning, sec and controlling				63	1000/person	
	South	No Response						

9) Probability of sending trainee to AT&TC

DO YOU SEND TRAINEE TO AT&TC ?

		YES
PUBLIC	ERA District	7
	RRA	3
PRIVATE	Contractor	0

Note: Number means number of offices

10) Certificate

ERA ATTC is recommended to give license, certificate specify in equipment operator (ERA)

All training should have national License and certificate. (RRA)

11) Textbook

About language of textbook

		Amharic	English	Others
PUBLIC	ERA District	4	5	0
	RRA	3	3	1 Oromo
PRIVATE	Contractor	1	1	0

Note: Number means number of offices

About the maximum price of textbook, if for sale

		Birr25	Birr 50	Birr 100	Birr 150	Birr 200	Others
PUBLIC	ERA District	3	2	0	0	0	0
	RRA	0	1	0	0	1	1
PRIVATE	Contractor	1	0	0	0	0	0

Note: Number means number of offices

12) Personnel

12)-1 Public

	ERA TOTAL(Excluding Alengena & Debra markos district)			Rural TOTAL			Public Total		
	Junior Level	Senior Level	Total	Junior Level	Senior Level	Total	Junior Level	Senior Level	Total
Project Managers / Civil Engineers	4	9	13	24	30	54	28	39	67
Site Supervisors	36	27	63	34	39	73	70	66	136
Laboratory technicians	4	11	15	2	1	3	6	12	18
Surveyors	1	11	12	30	28	58	31	39	70
Draftsmen	0	3	3	3	4	7	3	7	10
Workshop Managers / Mechanical Engineers	1	2	3	7	11	18	8	13	21
Workshop Supervisors	5	15	20	0	25	25	5	40	45
Mechanics	36	41	77	45	108	153	81	149	230
Electricians	20	26	46	10	35	45	30	61	91
Machinists	8	11	19	0	15	15	8	26	34
Welders & Body man	15	25	40	15	27	42	30	52	82
Tyre attendant	10	9	19	19	12	31	29	21	50
Construction Equipment Operators	0	27	27	0	0	0	0	27	27
Dump truck (On road)	26	62	88	5	38	43	31	100	131
Dump truck (Off road)	7	0	7	0	119	119	7	119	126
Water tanker (Water bowser)	1	11	12	0	7	7	1	18	19
Bulldozer	4	14	18	0	94	94	4	108	112
Excavator	0	2	2	0	0	0	0	2	2
Motorgrader	6	35	41	4	50	54	10	85	95
Wheel loader	5	19	24	2	30	32	7	49	56
Crawler loader	0	0	0	0	0	0	0	0	0
Macadam roller	0	0	0	0	0	0	0	0	0
Tandem roller	0	2	2	0	11	11	0	13	13
Vibration roller	2	3	5	0	15	15	2	18	20
Tyre roller	5	6	11	0	0	0	5	6	11
Asphalt finisher	1	3	4	0	0	0	1	3	4
Asphalt distributor	0	6	6	0	0	0	0	6	6
Chip spreader	3	0	3	0	0	0	3	0	3
Crane truck	1	0	1	0	0	0	1	0	1
Drivers	8	10	18	27	47	74	35	57	92
Computer operators	2	24	26	0	0	0	2	24	26
Helper, Worker	131	479	610	55	10	65	186	489	675
Administration	19	4	23	50	43	93	69	47	116
General affairs	37	57	94	75	101	176	112	158	270
Accountant	15	9	24	22	38	60	37	47	84
Store Keepers	30	26	56	24	61	85	54	87	141
Record Keepers/Workshop Assistant	3	12	15	8	20	28	11	32	43

Note: The data above are on 5 districts of RRA & 3 RRAs

12)-2 Private

	Private Total
Project Managers / Civil Engineers	11
Site Supervisors	20
Laboratory technicians	11
Surveyors	16
Draftsmen	6
Workshop Managers / Mechanical Engineers	5
Workshop Supervisors	11
Mechanics	51
Electricians	16
Machinists	7
Welders & Body man	27
Tyre attendant	10
Construction Equipment Operators	0
Dump truck (On road)	24
Dump truck (Off road)	2
Water tanker (Water bowser)	3
Bulldozer	11
Excavator	6
Motorgrader	14
Wheel loader	13
Crawler loader	4
Macadam roller	2
Tandem roller	4
Vibration roller	7
Tyre roller	0
Asphalt finisher	0
Asphalt distributor	1
Chip spreader	0
Crane truck	4
Drivers	38
Computer operators	10
Helper, Worker	1000
Administration	20
General affairs	5
Accountant	5
Store Keepers	8
Record Keepers/Workshop Assistant	4

Note: The data above are on 3 contractors

13) Construction equipment

13)-1 Public sector

	Construction Equipment	ERA		RRA		Total	
		No. of present equipment	Rate	No. of present equipment	Rate	No. of present equipment	Rate
1	Dump truck (On road)	67	23.8%	196	29.2%	263	27.6%
2	Dump truck (Off road)	40	14.2%	70	10.4%	110	11.5%
3	Water tanker (Water Bouser)	13	4.6%	30	4.5%	43	4.5%
4	Bulldozer	31	11.0%	143	21.3%	174	18.3%
5	Excavator	0	0.0%	1	0.1%	1	0.1%
6	Motorgrader	56	19.9%	123	18.3%	179	18.8%
7	Wheel loader	36	12.8%	71	10.6%	107	11.2%
8	Crawler loader	4	1.4%	0	0.0%	4	0.4%
9	Macadam roller	0	0.0%	0	0.0%	0	0.0%
10	Tandem roller	0	0.0%	0	0.0%	0	0.0%
11	Vibration roller	13	4.6%	28	4.2%	41	4.3%
12	Tyre roller	7	2.5%	0	0.0%	7	0.7%
13	Asphalt finisher	3	1.1%	0	0.0%	3	0.3%
14	Asphalt distributor	6	2.1%	0	0.0%	6	0.6%
15	Chip spreader	3	1.1%	0	0.0%	3	0.3%
16	Crane Truck	0	0.0%	1	0.1%	1	0.1%
17	Backhoe loader	0	0.0%	5	0.7%	5	0.5%
18	Fork lift	3	1.1%	3	0.4%	6	0.6%

Note: The data above are on 5 districts of ERA & 3 RRAs

13)-2 Private sector

	Construction Equipment	No. of present equipment	Rate
1	Dump truck (On road)	47	36.7%
2	Dump truck (Off road)	4	3.1%
3	Water tanker (Water Bouser)	5	3.9%
4	Bulldozer	16	12.5%
5	Excavator	7	5.5%
6	Motorgrader	13	10.2%
7	Wheel loader	12	9.4%
8	Crawler loader	4	3.1%
9	Macadam roller	2	1.6%
10	Tandem roller	0	0.0%
11	Vibration roller	13	10.2%
12	Tyre roller	0	0.0%
13	Asphalt finisher	0	0.0%
14	Asphalt distributor	0	0.0%
15	Chip spreader	0	0.0%
16	Crane Truck	2	1.6%
17	Backhoe loader	3	2.3%
18	Fork lift	0	0.0%

Note: The data above are on 3 contractors.

14) Construction equipment maintenance equipment

CONSTRUCTION EQUIPMENT MAINTENANCE FACILITY (Your Property)

		Equipment	No	Equipment	No	Equipment	No	Equipment	No	Equipment	No
ERA District	Alemgegn	No response									
	Debra markos	No response									
	Dire Dawa	No response									
	Gondar	No response									
	Finna	No response									
	Sashemane	Spring tension tester	1	Injection nozzle tester (37405)	2	Hydraulic Pressure tester	1	Con-rod Straightness	2	Volt-Ampere tester	1
Sodo D	Engine testing dynamometer	1	Engine reborring and honing machine	1	Fuel injection pump testing and calibrating machine	1	Gasoline engine testing machine	1	Crankshaft regrounding machine	1	
RRA	Amara	Heavy and light duty tools	2	Disc arc welding generator	2	Oxy Acetylene	2	Electric bench drill	2	Battery charger	2
	Hacate										
	Orzamin	Mobile Work	2	Greece Unit	3						
	Sodra	Mobile work shop	2	Well organized automotive repair workshop	1						
Contractor	Data is not available										

Note 1): Response of Sodo district is misguided.

15) Construction material testing equipment and other equipment regarding road construction / maintenance

Equipment & tool regarding civil engineering (Your Property)

		Total Station	Transit	Level	Schmidt hammer	Thermometer	Rain gauge
PUBLIC	ERA District	3	2	4	3	1	2
	RRA	2	3	3	1	1	1
PRIVATE	Contractor	3	2	2	1	0	0

Note: Number means number of offices

16) Laboratory facilities

MATERIAL TESTING EQUIPMENT (Your Property)

		Equipment	No	Equipment	No	Equipment	No	Equipment	No	Equipment	No	Equipment	No
ERA District	Alemgena												
	Debra markos												
	Dire Dawa												
	Gondar												
	Jijima												
	Shashemene	Field desity Equipment / Sand Methods/	1	Standard Compaction	1	Gradation test	1	Herburg test	1				
	Sodo 11	Heavy duty solution balance	1	Field density apparatus	2	Graduated Cylinder	1	Asphalt stability machine (Marshall)	2	Los angeles abrasion Machine(1) / Concrete strength compression machine(1) / Mortar Strength machine(1)	1		
RRA	Arbaha	Triaxial Machine	1	Direct Shear Machine	1	Consolidation Machine	1	CBR Machine	1	Compressive Strength Testing Machine	1		
	Hegere												
	Oromia	Procter compaction test		Slump test		Consistency & Workability test		Compression strength test		Concrete mix design		Sieve analysis	
	South	Surveying Equipments		Soil Laboratory testing Equipments		Concrete testing Equipment (Purchase requested)							
	Contractor	Soil testing equipment		Concrete testing equipment									

Note 1): Response of Sodo district is misguided.

17) Problems

17)-1 Problems regarding construction equipment operation

		Fund shortage	Skill shortage, trained personnel	Construction equipment maintenance facility shortage	Spare parts availability	Lack of information
PUBLIC	ERA District	3	5	5	5	2
	RRA	3	3	3	3	2
PRIVATE	Contractor	0	2	1	1	0

Note: Number means number of offices

Main problem regarding construction equipment operation in your company

No extended experience in operating machines (ERA)

When new machines distributed to district, sometimes, no training would have been given to the operators, so that, some of them face problems in handling & operating those machines safely. (ERA)

No problem (ERA)

Due to long age, Shortage of Spare parts and also the skill of operator (ERA)

Construction equipment are not operated by operators who are highly skilled in operation and also in the total they are ?????? (ERA)

Availability of Equipment (ERA)

The main problem regarding construction equipment in our organization is that the existing equipment being so aged their down time as high which in turn affects our productivity. (ERA)

The main problem of our machinery affect is there is old age, nature of terrain and fund shortage (RRA)

Frequent accident occurrence (RRA)

Lack of documentation and high down time (RRA)

Lack of skill, Low work performance, Lack of self management and control (RRA)

17)-2 Problems regarding construction equipment maintenance

		Fund shortage	Skill shortage, trained personnel	Tool shortage	Construction equipment maintenance facility shortage	Spare parts availability	Lack of information
PUBLIC	ERA District	6	5	5	6	5	2
	RRA	2	3	3	2	3	2
PRIVATE	Contractor	2	1	1	1	2	1

Note: Number means number of offices

Main problem regarding construction equipment maintenance in your organization, company etc.

- No special testing and geofinizing instruments for different types of make (ERA)
- In our district there is a shortage of technicians toolbox, testing tools etc. (ERA)
- When receiving new const-machines short days training must be given to technicians how to maintain the new machines. (ERA)
- Technicians must be trained to improve or maximize equipment maintaining efficiency. (ERA)
- Low efficiency (ERA)
- Due to long age, Shortage of Spare parts and also the skill of operator (ERA)
- Almost all construction equipment are not operating long time once they (ocf) are maintains and some equipment are not operable they are always under repair (ERA)
- The existing equipment number is compared to the work load being less, equipment which could be maintain with minimum cost woud be allowed to work because of shortage, then later if needs a higher maintenance cost for the sake of the work (ERA)
- The maintenance system not well organized, and lack of training for our technicians, working equipment and tools. (RRA)
- Only break down maintenance and minor Lubrcation change programmms (RRA)
- Lack of skilled manpower, randam (unplanned) repair and maintenace work, which is caused by lack of spareparts. (RRA)

17)-3 Problems regarding construction work site supervision

		Fund shortage	Skill shortage, trained personnel	Tool shortage	Lack of information
PUBLIC	RRA District	4	3	5	1
	ERA	1	4	1	1
PRIVATE	Contractor	0	2	0	0

Note: Number means number of offices

Main problems regarding construction work site supervising in your company, organization

Our is???????? (ERA)

No field test equipment (ERA)

An adovocate numbers of supervisors (ERA)

Shortage of small vehicles for supervisor to supervise the work which are far from head quarter (ERA)

Works are not usually supervised at site efficientlly in terms of Quality and Quantity (ERA)

Lack of skilled and trained technical staff (RRA)

Lack of supervision vehicle (RRA)

The Structure of Rural Road Section consists only six persddonn. (RRA)

Lack of trained technical personnel to undertake supervise (RRA)

Lack of manpower according to the structure of the organization (RRA)

18) Management

18)-1 Construction equipment management

		Record keeping	Cost evaluation system	Disposal system	Computerized
PUBLIC	ERA District	7	5	6	1
	RRA	3	1	0	0
PRIVATE	Contractor	2	1	0	0

Note: Number means number of offices

18)-2 Tool management

		Store control	Computerized
PUBLIC	ERA District	6	0
	RRA	3	0
PRIVATE	Contractor	2	0

Note: Number means number of offices

18)-3 Spare parts management

		Store control	Computerized
PUBLIC	ERA District	7	0
	RRA	3	1
PRIVATE	Contractor	2	0

Note: Number means number of offices

19) Number of Construction Equipment by the Ministry of Infrastructure

Number of Construction Equipment

Type of Equipment	Private Contractor		Public Contractor		Rental Service	
	No.	%	No.	%	No.	%
Dozer	138	20%	45	23%	10	14%
Grader	94	14%	26	13%	5	7%
Loader	165	24%	47	24%	28	40%
Excavator	54	8%	11	5%	14	20%
Scraper	2	0%	5	3%	0	0%
Compactor	121	17%	38	19%	10	14%
Asphalt Finisher	4	1%	1	1%	0	0%
Asphalt Mixer	2	0%	0	0%	0	0%
Crusher	91	13%	11	6%	3	5%
Concrete Batching Plant	0	0%	3	2%	0	0%
Concrete Paver	0	0%	0	0%	0	0%
Tower Crane	20	3%	8	4%	0	0%
Total	691	100%	195	100%	70	100%

Note: Excluded the C.E. Owned by Public sector and Foreign Contractors

20) Number of ERA's Staff

Operators, Mechanics etc. of ERA (From ERA HQ)

	Class	No.	
		No.	Total
Helper	I	26	887
	II	861	
	III	—	
Equipment Serviceman	I	45	64
	II	10	
	III	9	
Stationary Equipment Operator	I	77	144
	II	27	
	III	17	
	IV	9	
	V	14	
Equipment Electrician	Junior	11	129
	I	11	
	II	40	
	III	40	
	IV	15	
	Foreman	12	
Equipment Mechanic	Junior	30	252
	I	30	
	II	94	
	III	62	
	IV	16	
	Foreman	20	
Equipment Operator	I	122	971
	II	65	
	III	525	
	IV	235	
	V	24	
Equipment superintendent	I	8	26
	II	14	
	III	4	
Asphalt plant foreman		2	2
Equipment maintenance services branch chief (District)		5	5
Equipment Maintenance (Central Garage) Section Head		2	2