エチオピア連邦民主共和国

水技術機構

水技術機構アドバイザー

（職業訓練需要調査）

業務完了報告書

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独立行政法人

国際協力機構（JICA）

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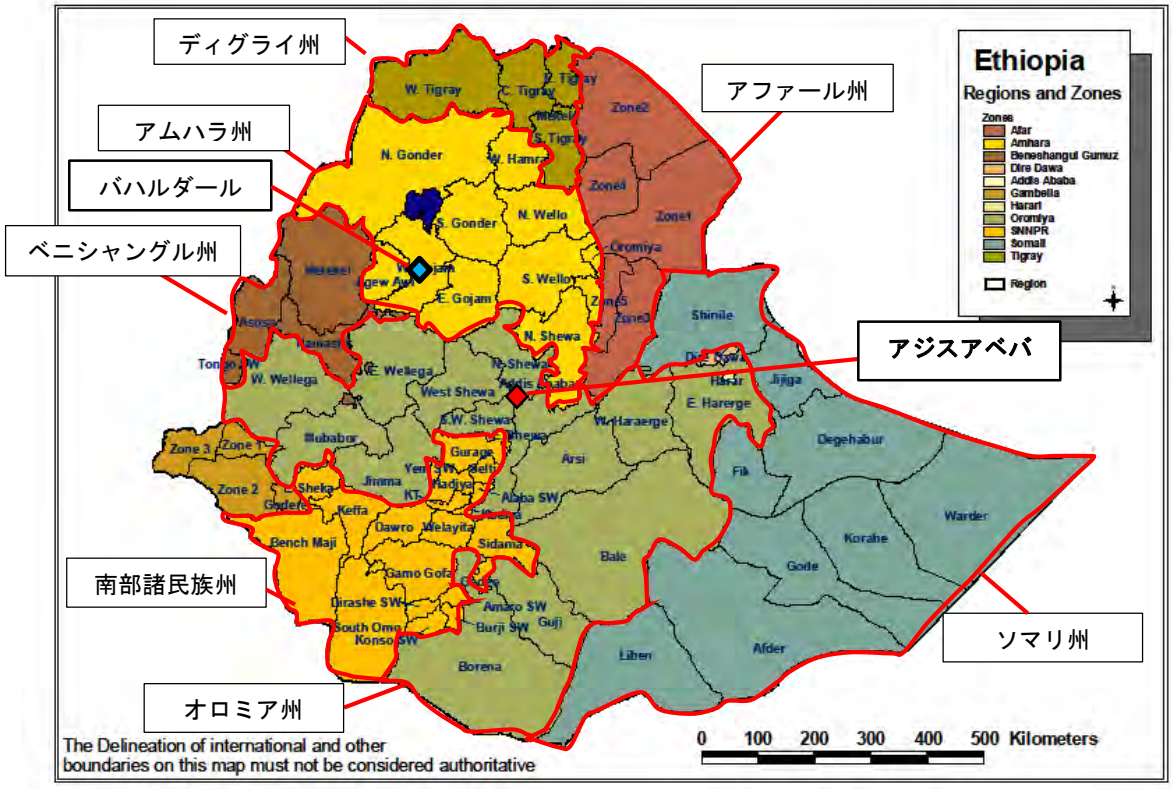
UN Map を参照し、オーピーシー株式会社が作成。http://www.un.org/Depts/Cartographic/english/htmain.htm

基礎情報

国名	エチオピア連邦民主共和国
首都	アディスアベバ
行政州	アファール州、アムハラ州、ベニシャングル・グムズ州、ガンベラ州、ハラリ州、オロミア州、ソマリ州、南部諸民族州、ティグライ州、アディスアベバ（首都）、ディレ・ダワ（自治区）
面積	109.7万平方キロメートル（日本の約3倍）
人口	約9,173万人（2013年：世銀）
民族	オロモ族、アムハラ族、ティグライ族等約80の民族
宗教	キリスト教、イスラム教他
言語	アムハラ語、英語
レート	1米ドル＝約19BIRR（ブル）（2014年7月現在）
GDP	10.5%（2013年：世銀）
主要産業	農業（穀物、豆類、コーヒー、油糧種子、綿、サトウキビ、ジャガイモ、チャット、花弁、皮革〈牛、羊、山羊〉）

引用：外務省「エチオピア連邦民主共和国（Federal Democratic Republic of Ethiopia）基礎データ」2014年9月1日作成。(http://www.mofa.go.jp/mofaj/area/ethiopia/data.html#section1)



UN Office for the Coordination of Humanitarian Affairs（2003 年 9 月作成）を参照し、オーピーシー株式会社が作成。

略語集

EOS: エチオピア職業規格

EWTI: エチオピア水技術機構

FGD: フォーカスグループディスカッション

GTP: “Growth and Transformation Plan” (エチオピア政府 5 ヵ年計画)

JICA: Japan International Cooperation Agency

MoWIE : Ministry of Water, Irrigation and Energy (2015 年 11 月より Energy は Electricity に変更)

TVET: Technical Vocational Educational Training

TVETA: TVET Agency

TVETC: Technical Vocational Education and Training College

1. 専門家の活動内容と達成状況

1.1. 業務の背景・目的

1.1.1. 業務の背景

エチオピア連邦民主共和（以下、「エ」国）は、安全な水へのアクセス率が低く[1]、安全な水の供給は、基礎教育・保健医療・農村開発等と密接に関連する横断的課題と認識されている。このような状況の中、「エ」国政府は 1994 年より地方分権化政策を採り、それに伴って地方給水事業の権限が各州政府に移管された。その結果、各州政府による給水事業の展開に必要な技術者の育成、給水施設の維持管理が急務とされた。「エ」国における水セクター最上位計画である「国家給水衛生向上計画（UAP：Universal Access Plan）」が 2005 年に制定及び 2011 年に改訂され、新 UAP においては 2015 年までに約 2 万人の技術者の育成が必要であるとしている。

国際協力機構（以下、JICA）は 1998 年 1 月から 2013 年 11 月までの約 15 年間に亘り、技術協力プロジェクト「地下水開発・水供給訓練プロジェクト（フェーズ 1~3）」を実施し、「エ」国の水資源管理分野における人材育成・組織強化の支援を行ってきた。フェーズ 1 では、水・灌漑・エネルギー省[2]（MoWIE：Ministry of Water, Irrigation & Energy of Ethiopia）をカウンターパート機関（C/P）として、MoWIE 下に組織されたエチオピア・ウォーター・テクノロジーセンター[3]（EWTEC：Ethiopian Water Technology Centre）新設に係る支援及び同センターにおける基礎コースの設置・実施支援等[4]を行った。その結果、EWTEC は、水分野における給水人材育成機関の中核としての機能を定着させた。後続のフェーズ 2 では、井戸や給水施設の維持管理能力の不足等に起因し、給水率の向上が依然困難を来たしていることから、アフリカ向け研修の開始を含むセンター機能拡充及び調査研究活動を通じた研修教材開発等を行い、約 1,900 名が研修を修了した。フェーズ 3 では、EWTEC が地下水開発および維持管理に係る人材育成ニーズに持続的に応え、自立化するための支援を行った。これら活動の結果、EWTEC は、連邦政府のみならず、州、他ドナー等、幅広いステークホルダーから「エ」国における水資源開発に携わる人材育成の中核機関として認知されるようになるとともに、EWTEC は、UAP において重要な人材育成機

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[1] JICA「エチオピア連邦民主共和国「地下水開発・水供給訓練計画フェーズ 3 終了時評価調査報告書」2013.6

[2] 案件実施時は、水資源省。

[3] 案件実施時は、アディスアベバ訓練センター。

[4] 井戸掘削技術を中心とする 3 つの常設訓練コースを設立し、補完的コースとして個別分野及び地方での研修を試行した。（外務省 国際協力 ODA ホームページ「国別プロジェクト概要」）

関として位置付けられ、2012 年 6 月にエチオピア水技術機構（EWTI：Ethiopian Water Technology Institute） へと組織改編され、国立公益機関（Public Institute）となった。これによって、エチオピアの職業規格（EOS：Ethiopian Occupational Standard）に沿った長期研修や職業訓練機関の講師育成、水分野の実務者向けの短期研修の実施が期待されることとなった。

しかしながら、現在の EWTI においては具体的な経営体制整備計画や講師確保・教材整備等研修実施に必要な体制整備計画が策定されておらず、 EWTEC 時代から実施している短期研修以外の研修については、 実施の目途が立っていない。 特に、 水分野における人材育成の需要や職業訓練機関の運営に関する各種制度・条件等、 同計画の策定に不可欠な情報が不足しているが、 EWTI 独自にはこれらの情報を十分に収集し、 同計画を策定することが困難な状況にある。このような状況下、 EWTI の能力強化を目指し、水技術機構アドバイザーの派遣が我が国に要請された。

1.1.2. 業務の目的

本案件は、2 名の専門家がアドバイザーとして従事し、「エ」国の水分野における人材育成の需要（職業訓練需要調査）及び職業訓練機関の運営に関する各種制度・条件を確認・分析のうえ、EWTI における経営体制整備計画・研修実施に必要な体制整備計画の策定を支援（職業訓練機関運営）するものである。あわせて、これら 一連の活動を通じて EWTI が自ら情報収集を行うことにより、同計画を策定する能力を強化するねらいもある。

本件業務従事者である「職業訓練需要調査」担当アドバイザーが C/P と共同で計画・実施する労働市場調査は、もう 1 名の「職業訓練機関運営」アドバイザーが担当する、EWTI の経営体制および研修実施体制整備のための計画策定に必要な、訓練需要及び労働市場に関する情報を提供する目的で行うものである。またこのプロセスを通じ、C/P に職業訓練需要調査及び調査監理に関する技術移転を行うことも、目的のひとつである。

1.2. 業務の内容成果

本案件では主に以下の業務を実施した。詳細は次頁以降のとおり。

(1)「エ」国側 C/P と共同で実施する労働市場調査の計画、実施、及び調査監理と、それらに関する C/P への技術移転・能力強化。

(2) 現地調査を再委託するローカルコンサルタントの選定・調達・調査監理にかかるエチオピア事務所支援。

(3) ローカルコンサルタントの現地調査結果検証を行い、同コンサルタントに対して必要な対応を指示。調査結果速報、および収集データにより構築したデータベースの紹介。

業務	成果
（1）労働市場調査の計画、実施、及び調査監理、それを通じた C/P への技術移転・能力強化。	
労働市場調査の計画 ①調査チームの形成	①アサインされた C/P 調査チーム（添付資料 3）に対し、調査オリエンテーションを行い理解を図った。また、調査の質問項目・対象者を C/P とともに検討し、C/P の案を取り入れた。
②調査計画策定のための基礎情報収集	②-1　キーインフォーマントインタビュー：C/P とともに行い（一部 C/P なし）、EOS に基づく長期コース設立にかかる関係機関情報および労働市場の動向にかかる情報を得て、調査設計および調査分析に活用した。なお、インタビュー相手方は添付資料 4 のとおり。 ②−2　基礎情報入手（C/P 側に指示）。 ・調査対象州の水関係行政機関リスト ・調査対象州の基礎情報入手 ・②で入手したオロミア語資料の翻訳 水関係行政機関リストの入手が困難であった。
労働市場調査の実施 ①文献調査の実施	①統計情報や政策、調査計画時に入手した情報（添付資料 5 収集資料リスト参照）を分析。C/P にも分担させる。
②質的調査の実施	②TVET 卒業生で現役の Technician　4〜5 名を対象としたフォーカスグループディスカッション（FGD）を C/P と 3 回実施。 第 1 回：8 月、水省にて 第 2 回：10 月、EWTI にて（C/P と阿部専門家） 第 3 回：11 月、Bahir Dar Polytechnic にて 計量的調査ではわからない、Technician の就労状況の現状や、TVET の教育訓練の現状が判明した。C/P はその結果をレポートに取りまとめた。
③現地調査にかかる方針検討、調査研修、プレテスト	③関係者の共通理解が深まり、より現実的な調査ツールの構築が可能となった。また、調査の副産物として、データベース構築の指示を具体的に伝えることができた。
④民間企業インタビューの実施（C/P）	④C/P に現地調査のうち、民間企業インタビュー5 件の実施を指示。5 件のうち 2 件のみの完了であるが、C/P は新規顧客層としての民間企業のニーズに直接触れることができた。
⑤C/P 調査チーム体制のサポート	⑤当初アサインされた C/P のうち、主 C/P を除くシニア 4 名の欠席・遅刻が著しいため、8 月下旬（第二次派遣時）に新規採用職員の若手 3 名を調査チームに加え、彼らに主要活動を担当させることとした。本件につき DG に問題点を伝達したところ、若手追加を承認され、お詫びの言葉があった。また DG 代理と任ぜられた管理職同席のもと C/P チームの反省会があり、改善の意思が伝えられた。 ただし上記若手 3 名のうち、 1 名－9 月に退職（大学院進学のため）、 1 名－10 月に EWTI 内 TVETC ニーズ調査チームに異動 1 名－担当の短期研修の開始により多忙 となった。加えて主 C/P も、BPR や DG から次々に任ぜられる新規

	業務で多忙の度を増し、結果として C/P 調査チームの機能低下、調査および調査監理業務は停滞した。
調査監理 ①C/P のローカルコンサルタント調査監理を支援	①EWTI 側の監理体制として、 「週 1 回同コンサルタントと進捗状況を打合せ」 「C/P1 名あたり 10 件の質問票抜き取り検査を行う」 「週 1 回 C/P は専門家と Skype（または電話）打合せを行う」こととした。 専門家との定期的打合せにより EWTI 側状況が把握できたが、C/P 側のローカルコンサル側との打合せは不活発で、質問票抜き取り検査も実施されなかった。
②ローカルコンサルタントからの提出物の精査、品質向上のための指示	②Inception Report, Interim Report, Draft Final Report, Final Report について受領し、精読後改善のための指示を行った。 報告内容についてのずれの補正、データの扱いや論理展開について、改善を求めた。 調査票の回収率は、計画数の 42%、実配布数の 62%、で非常に良好であったが、同時に調査票回収完了が 11 月にずれ込むこととなった。そのため、データ分析・レポート執筆の時間が少なくなり、上記のように報告書の質に影響したと思われる。 C/P 側からの各レポートの精読・フィードバックへの貢献は少なかった。
（1）にかかる C/P への技術移転・能力強化	①需要調査の意義については、C/P 内で理解度に差があった。 ②調査計画の策定、実施、実施監理の一連の流れを経験し、結果速報ワークショップにおいて、発表を経験させたため、需要調査の内容について、基本的な理解は得られたと思われる。 ③ただし C/P 側の活発かつ主体的な参加は限定的であったことから、技術移転・能力強化の度合いも限定的である。
（2）現地調査を再委託するローカルコンサルタントの選定・調達・調査監理にかかるエチオピア事務所支援。	
①公示	①公示の TOR 案、選定用評価基準案を作成し、エチオピア事務所に提出（添付資料 6）。
②選定	②応札 8 社からのプロポーザルを検討し、エチオピア事務所に参考意見を伝達。
③契約交渉	③契約交渉に同席し、技術的観点より見解を述べ、第 1 位の応札者との契約成立に至った。
④現地調査開始時	④質問票案、サンプリング案、工程案などを受注したローカルコンサルタントに提供し、意見のすり合わせを行うことで、効率的に発注者側の意図に沿う調査設計ができた。 また、収集データによるデータベース構築についても、予め作成したデータベース（案）を提供したため、発注者の意図に沿った適切なデータベースが作成された。
⑤調査監理	⑤調査開始後（帰国中）、調査監理はおもに e-mail を通じてローカルコンサルタント・EWTI・エチオピア事務所とのコミュニケーションを図りながら支援した。メールで困難な場合は、エ事務所担当者に EWTI・ローカルコンサルタントと会議を開いての問題解決をお

	願いした。結果的に期限内に成果品が納入された。
（3）ローカルコンサルタントの現地調査結果検証を行い、同コンサルタントに対して必要な対応を指示。調査結果速報、および収集データにより構築したデータベースの紹介。	
①現地調査結果検証	①現地調査結果検証については、アディスアベバで 2 件（民間企業）、アムハラ州バハルダールで 1 件（バハルダール水道局）において直接訪問による検証を実施。調査員のミスによるエラーはなし。ただし、先方が後送するとした情報が未入手だったため、追加入手を指示。
②調査報告書の作成	②調査報告書の作成については、技術的観点から指摘・助言を行い、限られた時間の中で品質向上に努めることができた。
③調査結果およびデータベースの紹介	③調査結果速報ワークショップ（エチオピア事務所ご支援）において、C/P とともに調査結果概要を発表。ローカルコンサルタントには現地調査結果報告を指示するとともに、EWTI 内において構築したデータベースの紹介を説明させた。これにより、水省・TVET Agency、EWTI 幹部が需要調査（結果）の存在を認識した。また、EWTI 側で今後これを活用し研修・訓練のあり方を検討するフォーラムを開催する予定。 また、EWTI 内でデータベースの研修を希望する声が上がった。

1.3. 達成事項

1.3.1. 「エ」国側 C/P と共同で実施する労働市場調査の実施

(1) 調査内容

EWTI 内に編成された C/P とワークショップや打合せを繰り返しながら、労働市場調査を計画した。調査テーマは、今後 EWTI で実施予定の「EOS に基づく長期コース（TVET コース）」で養成される水分野の“Technician”にどのような需要があるかである。この調査で判明した雇用および訓練の需要にもとづき、EWTI では長期コースの立ち上げを検討することになる。

主として以下の点について、“Technician”の就業先である水分野の官・公・民の各部門の各団体に、半構造的質問票を用いて調査した。

- 現在の労働市場（量・質：職種や職階[5]）
- 雇用状況
- 在職者訓練の状況（過去 3 年の実績および今後 5 ヵ年の予定）
- 将来の労働市場（今後 5 ヵ年の雇用予定）

[5] Assistant Technician を TVET Level I-II、Technician を同 LevelIII、Foreman/Chief Technician を Level IV と解釈することにした。

なお、EWTI の今後の長期コース開講準備や短期コースの改善、新規事業展開の参考とするため、以下の点についても調査項目に加えた。

- TVET の Cooperative Training（企業内現場実習[6]）の受け入れ経験
- 同 Cooperative Training の課題
- Engineer 等、Technician 以外を含めた在職者訓練の予定（今後 5 年間）
- Engineer の将来の労働市場（今後 5 ヵ年の雇用予定）
- EWTI に期待するサービス

(2) 調査対象地

調査対象地は、水分野 TVETC のある 7 州(Afar, Amhara, Benishangul Gums, Oromia, SNNP, Somali, Tigray)および EWTI が所在するアディスアベバ。

(3) 調査方法

現地調査を委託したローカルコンサルタントによって、面接および留め置き（質問票を託し後日回収する）調査法によって、424 団体から回答を得た[7]。

加えて、文献調査および官・民関連団体のキーパーソンに対するインタビュー（キーインフォーマントインタビュー）、現役 Technician に対するフォーカスグループディスカッション（FGD）による計質的調査による分析も加味した。

(4) 調査結果概要（詳細は添付資料 7-1、7-2 のとおり）

1) 長期コースにより養成される“Technician”労働市場調査 分析結果 要点

項目	結果要点	EWTI への示唆
現在の Technician の概況	・ 水分野全セクターの技術者のうち約 6 割強を占める。Technician を訓練する意義は大きい。 ・ 4 分の 1 強は Certificate/Level I-II 以下のため、適切な教育訓練を受けずに従事していると思われる。	・ 長期コースによる Technician 育成は有益 ・ 低学歴 Technician(AA 在住)のスキルアップを短期研修で実施できる
雇用、業務にかかる問題	・ 技能・知識ある Technician の不足。雇用者・被用者ともに悩み。 ・ 被用者からは、給料の安いのが悩み。 ・ 新卒者が最も就職に不利	・ Technician 向けの短期研修コースのニーズあり ・ 長期コース卒業生には積極的な就職/起業支援があると良い

[6] 本来は、TVETC での座学 30%、企業内現場実習 70%とされている。ただし現実には、割合は逆であるという（Bahir Dar Polytechnic 講師談）。また、受け入れ先は民間だけではない。
[7] 現地調査委託のローカルコンサルタントの技量不足から、現地調査結果分析の質、精度には限界がある結果となった。調査結果レポートはそれを念頭において読まれたい。

項目	結果要点	EWTI への示唆
労働市場	・ 官/公/民ともに高い離職率、生産性に影響。若年層、都市部ほど高い可能性。経済成長で拍車かかる。 ・ 技量ある Driller は国内供給がほとんどなく、外国人をリクルートせねばならない。よって強い国内需要がある。 ・ 農村における Technician の供給不足。 ・ GTPII 見込みより需要は大きい模様：図 1、別表 3	・ MoWIE 等、関係機関の協議により農村部での供給不足解決策を立てる必要あり ・ EWTI,TVETC, の輩出する人材で供給十分か。 ・ 「EWTI での研修」を離職防止策としてアピールすることができる。
職種	・ Driller, Drilling Machinery Maintenance の訓練校がなく、切望されている。 ・ 今後需要多い職種は別表 1	・ EWTI は左記の長期コースが提供できる唯一の機関。
研修ニーズ	・ 民間の研修ニーズ（Engineer, Technician とも）は大きい。有料でも研修を望む。 ・ EWTI の研修手続きは非効率的。 ・ ニーズの大きい研修テーマは別表 2。 ・ その他、EWTI のサービスへの期待大。特に、民間・Woreda レベルから。	・ EWTI への期待大、民間向け枠を拡大すべき。 ・ 6 ヶ月前からの案内、受講条件や選考基準など透明に。
TVETC	・ TVET 卒業生の技能が低いため、教育訓練の質が低いようである。 ・ 企業現場実習の占める割合・実習の質が低い。受け入れ先が少ない（産業界の協力が少ない）。 ・ 在職者研修の実施機関ではないが、地元中小企業への技術的支援を行っている。	・ EWTI は産業界との連携を開始し、早期に企業実習先の開拓に着手すべき。 ・ EWTI の TVETC 支援は、TVETC および官民現場のニーズをよく把握して実施されるべき。

別表 1：今後 5 年間に需要の多い Technician の職種（424 団体）

	Foreman or Chief Technician	Technician	Assistant Technician
1	Mechanic/Drilling Machinery Maintenance Technician	Plumber	Heavy Equipment Operator
2	Surveyor	Mechanic/ Drilling Machinery Maintenance Technician	Plumber
3	Plumber	Mason	Mechanic/ Drilling Machinery Maintenance Technician
4	Heavy Equipment Operator	Electrician	Carpenter
5	Electrician	Heavy Equipment Operator	Surveyor

別表 2：今後在職者研修の希望が多い分野（424 団体）

	Engineer/ Technical Professional	Foreman or Chief Technician	Technician	Assistant Technician	Other*
	(BSc and above)	(TVET LEVEL IV)	(TVET LEVEL III)	(TVET LEVEL I-II)	
1	Software	Construction Management & Contract Administration	**Electro-mechanical & machine maintenance**	Plumbing	Water Treatment
2	**Geology & hydrogeology**	Surveying	Plumbing	**Electro-mechanical & machine maintenance**	**Electro-mechanical & machine maintenance ***
3	Construction management & Contract Administration	**Electro-mechanical & Machine Maintenance**	Operation and maintenance	Water Works construction	Administration & Finance
4	**Design of Water Supply Systems**	Plumbing	Water works construction	Operation & maintenance of Water Schemes	Community participation & Water committee

*”Other”の区分には多様な職種が含まれる。

上記の「**太字**」部分は、現在 EWTI で実施している研修分野と重なる部分であり、EWTI で直ちに需要を満たしていくことが可能と考えられる。

別表 3：今後 5 年間の予測

GTPII	EWTI- GTPII	9 TVETCs**	今後 5 年間の需要予測試算
Middle Level Technician	Long-term course based on EOS	(2007-2008 年間学生数計×5)	Technician
13,000	**625**	23,360	31,144

**図 1 参照

EWTI で供給できるのは GTPII で必要とされる人材の 5%でしかない。9TVETCs が輩出できる人材と合わせると 23,985 人となり、GTPII で必要とされる人材を満たすことは可能である。

一方、本需要調査の試算では官・公・民セクター合わせて 3.1 万人と見込まれ，GTPII の見込みよりはるかに大きい。試算には GTPII のいう“Middle Level Technician”が想定する“Water Supply Technicians”, “E&M Technicians”, “Drillers” を超えた部分も含まれる。コンクリート工・鉄筋工・重機運転手・CAD オペレーターなど水セクターに関わる幅広い職種を念頭におくと、水分野の Technician 労働市場需要は GTPII の見込む数値より大きくなる。

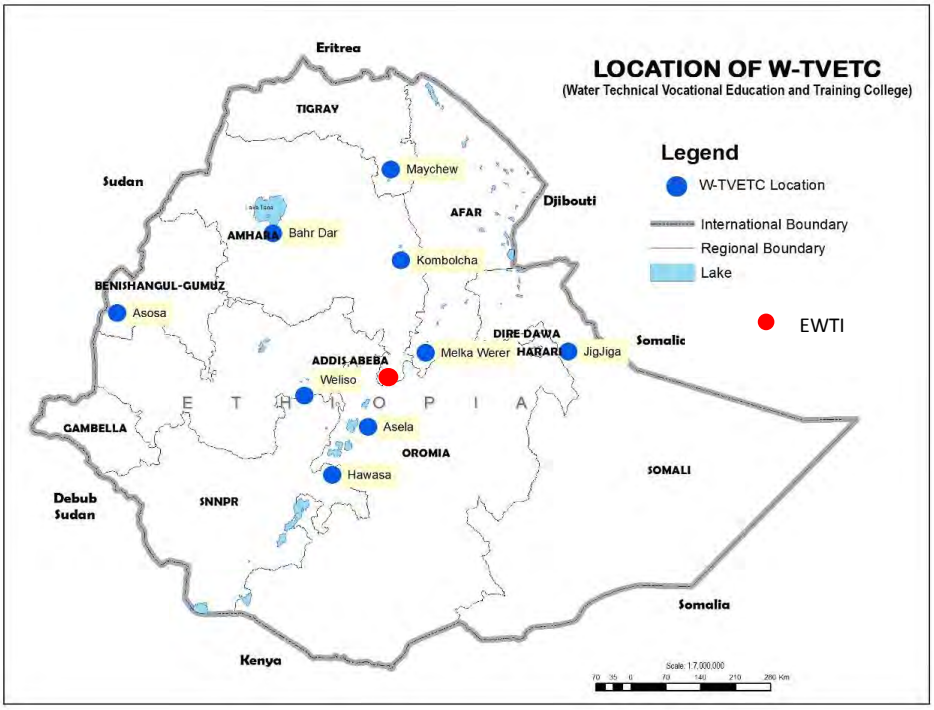

図 1：9TVETCs と EWTI

2)　EWTI でどのような研修運営をすべきか

①すでに長期コースのカリキュラム開発が出来上がっている Drilling, Electromechanical の開講準備を進める。その中で早期に産業界との連携を開始する。

②短期コースでは、別表 2 の太字部分がすでに既存コースでカバー可能。民間および Woreda レベルから、在職者研修への参加が切望されていることから、これらの対象者を積極的に受講者に含めていく。Woreda レベルを増員することで、農村部の Technician 技能アップの一助となる。

③その他の新しいコースの実施については、別表 2 に基づき、需要の高い分野・レベルをターゲットにし、講師人材や資機材の状況、他機関との住み分けにより検討されるべきである。

④需要調査の参考、および 6 ヶ月前からの募集案内、参加条件・選考基準の公開に努め、受講者目線でより効果的・効率的な研修運営を展開する。特に民間への在職者研修を有料で提供することで、収入源の追加や、より質の高いサービスを提供する動機付けになると考えられる。

1.3.2. 調査結果速報、および収集データにより構築したデータベースの紹介

(1) 調査結果速報紹介

現地調査の結果および、キーインフォーマントインタビュー、FGD で得た情報について、結果速報ワークショップにおいて外部関係者及び EWTI 内 Directors に向けて紹介した（添付資料 8　ワークショッププログラム）。外部からは MoWIE、TVETA、Water Construction Contractors' Association から参加者があった。参加者からは「有意義である」、「JICA の支援に感謝する」、とのコメントとともに、「灌漑分野の機関が含まれるべきだ」との指摘も寄せられた。

(2) 収集データによるデータベース構築と、その紹介

現地調査を通じ収集した各団体の情報（連絡先、予算/売上げ規模、従業員数、職種別人数（Technician のみ細かい業種区分・雇用情報あり）、在職者研修の実績と予定、今後５ヵ年の採用予定、等）は、今後 EWTI にとって有用な情報となる。そのため、それをデータベースの形で保存し、今後活用してもらうこととした。データベースは汎用性の高い ACCESS とし、添付資料 9 のような体裁でローカルコンサルタントに構築させた。

今後の活用法としては、例として以下のようなものが考えられる。

- 長期コースにかかる Cooperative Training[8](の受け入れ先探し)
- 短期コースの民間セクターへの案内
- 短期コース受講の記録、参加候補者の抽出

ワークショップ翌日には、EWTI 内部で一般職員を含め、調査結果の活用とデータベースに関する会議を計画したが、C/P 側の準備不足から討論には至らなかった。ただしデータベースの紹介は実施でき、高い関心を呼んだ。データベースの活用方法に係る研修への希望が多く出たため、今後 EWTI で検討されるものと思われる。実際のデータベースの管理・活用は、Planning Department のデータ管理担当官で行われる予定。また、Registrar も活用の可能性がある。なお、この 2 名は ACCESS を使用できる能力があるとのことである。

1.3.3. 労働市場調査の計画、実施、及び調査監理に関する C/P への技術移転・能力強化

[8] 職業訓練の「企業内実習」にあたるもので、TVETC の教育訓練の 70%の割合を占めることとされているが、実際には 30%しかできていないという（Bahir Dar Polytechnic の Instructor 談。）

前項でも述べたが、C/P への技術移転・能力強化の達成度は概して限定的である。達成したのは以下の点と考える。

①調査計画、実施、報告にかかる一連の流れ
②主要な情報提供者に対する計質的調査手法
③一部の計量的分析
④レポートやプレゼンテーションの準備にかかる効率的手法[9]（主に、主 C/P に対して）

未達成部分が多かった背景には、以下の点が考えられる。

- **需要調査の順序**：すでに長期コースのカリキュラム開発が先行[10]して、需要調査の意義について十分な理解を得ないままの C/P がいた。
- **組織再編時期に重複**：EWTI 内で、BPR (Business Process Re-Engineering)が需要調査と同時期に進行し、C/P が組織改編の作業に時間を取られてしまった。
- **主 C/P の多重業務**：主 C/P は、BPR の事務局を勤めるとともに、他の新規業務やドナーとの対応、急に入った TVETA による TOT 参加、などを集中的に担当したため、需要調査チームのコーディネーションや、調査・調査監理活動が手薄になってしまう時期が多かった。
- **消極的な他 C/P**：初めに任命された Director 層は、友好的ではあったが、自己の業務との相違や、別途の手当て等がないことから、参加意欲が低かった。
- **活用できなかった若手人材**：補充的に入れた新規採用の若手職員も、司令塔（主 C/P）の不在で活動が低調になった。
- **調査業務環境**：EWTI で、本調査のための電話代の支給や、出張に伴う日当などの準備がなかった。また、新校舎建設中の仮オフィス（新 EWTI オフィス）では、インターネット環境やコピー機などがなく、調査業務に適した環境が整っていなかった。

1.4. 計画と進捗に齟齬があった場合その理由

1.4.1. 「需要調査結果速報を受けての EWTI 内討議」の未達成

現地調査結果ワークショップ後、EWTI 内で「需要調査結果に対し、今後どのように EWTI がその対応に取り組んでいくか」をテーマとしたディスカッションを実施する予定

[9]無料のクラウドサービスを通じたチーム内のファイル共有・編集作業や、Skype を用いた遠隔地間打合せの方法、会議の効果的な進め方、EXCEL のデータベース機能を活用した情報管理スキル。
[10] 需要調査の実施は予定されていたが、政府側からのプレッシャーのため長期コースカリキュラム開発が EWTI 内で先行する結果となってしまった。

であった。職業訓練機関運営専門家も同席のもと、各部署より Director または代理、最低1名の出席を予定していた。

しかしながら、集まりが悪かったこと、ようやく人が集まっても前日のワークショップに出席した Directors が多く、調査結果は既に聞いた参加者が大半となったことから、調査結果の一部を発表した後データベースの説明に切り替えることとなり、ローカルコンサルタントからのデータベース説明をもって終了となった。そのため、予定したディスカッションは実施できなかった。

この理由は、主 C/P が Adama での TOT 研修（TVETA による、教授法研修[11]）に戻ったため、召集をリマインドする者がいなかったこと、その他の C/P も積極的に参加を呼びかけなかったこと、案内が EWTI 内で周知徹底されていなかったこと、などがあげられる。

1.4.2. 全体的な調査関連作業の遅れからくる、調査の質への影響

結果として、調査報告書は完成したが、これは本来 C/P が担当すべきであった部分を取り急ぎ専門家やローカルコンサルタントがカバーした部分も含まれ、C/P が予定に従ってリサーチを進めていれば、調査の質はより高まったと思われる。今回の派遣では、C/P 側のコミットメントの少なさ、C/P 機関の受け入れ体制上の課題により、当初想定していた C/P 側の活動が非常に少ないまま期間を終了したのがその原因である。

2. 専門家指導分野およびその関連分野で、今後 C/P 機関の強化を達成するために残された課題

職業訓練需要調査、ならびに短期研修を含めた訓練ニーズ把握の面で残された課題としては、以下があげられる。

(1) 今回の調査結果を EWTI 事業にいかに反映させていくかの検討。検討においては、特に新規採用職員や、現場の一般職員の参加が重要であると考える。常に会議に召集される管理職との間にギャップをなくすこと、さらに新鮮な目あるいは顧客に近い現場目線で、把握した市場の需要・ニーズにどう応えていくか提案できると考えられるためである。具体的には、①どのように長期コースを立ち上げるのか（学科およびレベル）、②すでに開発した長期コースカリキュラムをいかに活用していくか、③短期コースのプログラムの見直し④募集選考等の手順の見直し、について議論が望まれる。

[11] 当専門家派遣の約 1 週間前に決定したとのことで、3 週間の研修期間。

(2) TVETA、MoWIE との協議により、他の 9TVETC（や、必要によりその他 TVETC）でどのように労働需要に合った人材を供給していくかの検討。今回把握した需要調査結果は、EWTI 単独で満たせるものではない。検討の際には、①EWTI と TVETC がどのように分担・連携して、需要を満たしていくか②EWTI の TVET Support Office のマンデートとなっている、他 TVETC の支援事業の中に、どう具現化するか、に留意する。

(3) 研修・訓練の PDCA サイクルの確立。EWTI 内でどのように今後需要調査/把握を実施するかの検討。今回の需要調査は、GTPII と、それに伴う EWTI の 5 ヵ年計画に合致するタイミングで実施でき、現在および今後 5 年間の需要予測を含むことができた。しかし、このような大規模調査は、EWTI 単独では実施できず、また本来 TVETA・MoWIE 等も関与すべきものである。従って、

① 長期コースにおいては、他の TVETC が州 TVETA (TVET Commission)と連携して実施している需要把握の標準的方法[12]を確認しつつ、今回の調査で得たネットワークから、長期コースの学科に直接関連する雇用先（官・公・民）から採用予定情報を得る、といった方法が考えられる。
② 短期コースについては、現在ルーティンで実施されているコース終了時の受講者アンケートを、きちんと分析し、次回の研修改善に確実に反映すること、また受講 1 年後等にサンプル的にインパクト調査を行い、研修プログラム全体の改善につなげることが望ましい。
③ とくに、今後民間企業に対し有料の短期研修を実施することで、より顧客のニーズに応じたサービスを実施していけるようになることが期待される。

(4) 需要調査/把握を担当する職員のスキルアップ（情報収集、関係者との連携）。今回、水関連行政機関の全体数の把握、統計データの取得など、C/P に課した基本的なリサーチが十分実行されなかった。環境面の不備はあっても、①関係者に打診して、基本的情報を取得・整理するスキル②基本的なアンケート調査の手法と関連する PC スキル、を向上させることは可能である。

(5) EWTI 仮オフィス（新オフィス）内の事務インフラの向上。オフィス事務機器、インターネット環境の整備により、業務が格段に円滑に進むと思われる。

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[12] キーインフォーマントインタビューによれば、TVETC は州 TVETA（または TVET Commission）と連携し、産業界からの需要を毎年集約しているとのことであったが、労働需要というよりは、入学予定者の把握と各校の入学者枠の調整、という印象を受けた。TVETC においては、基本的に卒業生の就労支援が行われていないと見られるため、真に労働市場を把握しようとしているか疑問である。従って TVETC の需要把握については、より詳細な確認が必要である。

(6) EWTI 職員の基本的執務スキルの向上。ファイリング、PC スキル（特に EXCEL の活用）、タイムマネジメント。基本的なことだが、格段の業務効率化が可能になる。

(7) EWTI 職員の組織スキルの向上。管理職と部下、部内、部門間の連絡や情報共有、コミュニケーションの促進が必要である。また、組織として、事業工程表の具体化、事業・業務の優先順位付けを行うべきである。加えて、特定の個人への過重な業務分担を避け、チームワークを取り入れることで、業務の効率化が促進されると考えられる。

(8) 新規採用・若手職員の離職防止策。職員の 有給休職進学制度において、学位取得後早期離職したのでは、EWTI にとってのメリットがなくなるばかりである。従って、同制度の適用者の厳正な選出と、復職後の一定期間の奉職を義務付け、進学のメリットを十分 EWTI にフィードバックさせる必要がある。

3. 指導分野およびその関連分野で今後受入国が取り組む必要があると考えられる課題

(1) 政府レベル（特に連邦政府）における、基本的情報の把握と公開。たとえば、州レベルでは Woreda,Town レベルの水事務所職員数を把握していたが、MoWIE ではそのデータは把握していない。また、Woreda, Town レベルの水事務所は年代により変化していくため、最新情報を MoWIE で把握し、公開して各関係機関の事業運営に資するべきである。
MoWIE 登録の会社リストも、重複の排除やカテゴリ分けの精度アップなどされることが望ましい。

(2) EWTI に対する現実的な工程表の作成と、その尊重。EWTEC が EWTI になったことで、マンデートが拡大したものの、それを一度に達成させるのは無理である。連邦政府、関係機関ともに一度に無理な活動を押し付けず、EWTI の作成する現実的なロードマップを尊重すべきであろう。

(3) GTPII を実現するための、MoWIE と関連省庁・機関による、水分野の総合的な人材育成計画があると望ましい。

4. 類似案件・類似分野の今後の協力実施にあたっての教訓・提言等

(1) C/P 機関で受け入れ準備を保障すること

C/P の正式な任命と EWTI 責任者による活動状況のモニタリングにより、活動への確実な参加を担保するべきである。同時に、調査活動に必要な電話代や出張用の日当の支給、調査活動への貢献に対する何らかの形の顕彰などを用意し、C/P の意欲向上にも配慮すべきである。

(2)　専門家派遣・従事期間にもう少し余裕を持たせること

今回のような業務は、ローカルコンサルタントとC/Pの双方を相手にしており、C/Pの能力強化も期待されているため、派遣期間・国内業務日数をもう少し長めに取る必要があると思われる。

(3)　C/P機関の対応に問題が発生した場合、より積極的な介入を

C/P調査チームの停滞、調査メンバーの突然の離職・異動による減員など、専門家個人の裁量を超える課題が発生したときには、貴機構が組織としてC/P機関に対応を求める、あるいは問題解決のための助言を行うことによって、専門家派遣という支援の効果を確保することができると思われる。

5.　写真集

次葉以降のとおり。

以上

活動写真

EWTI 正門

カウンターパート調査チーム

EWTI 新棟建築中

掘削実習用リグ　翌日より地方へ

Woliso Polytechnic College でのインタビュー、左より 2 人目が主 C/P

Woliso Polytechnic College

オロミア州 Sabata Water Supply & Sewage Enterprise

同公社が修理できない水道メータが取り外され大量に破棄されている

	
6 月より開始された EWTI の BPR。 Addis Abbaba 郊外で行われていた、管理職による活動レビュー	7 月より新棟完成まで約 2 年間賃貸した EWTI の管理部門仮オフィス。EWTI キャンパスより車で 10 分程度。
	
現地調査担当ローカルコンサルタントとのキックオフミーティング	ローカルコンサルタントによる現地調査研修（同コンサル研修室にて）
	
現地調査プレテスト（Addis Ababa 水道公社にて）に参加する C/P（右端）	若手を加えての、EWTI チーム現地調査監理体制打合せ
	
MoWIE にて、現役 Technician との Focus Group Discussion（右 2 名 C/P）	EWTI にて、研修受講者(Technician/Engineer)との Focus Group Discussion

	
Bahir Dar Polytechnic にて、同校卒業生の講師陣との Focus Group Discussion	Addis Ababa 現地調査結果検証（民間企業）（左端 C/P）
	
調査結果速報ワークショップ（Addis Ababa, Capital Hotel にて）	同ワークショップにて発表する主 C/P
	
ワークショップ後の「調査結果にどう対応していくか」の検討会	同会議でのデータベース紹介（ローカルコンサルタントより）

添付資料

添付資料 1：業務実施工程計画・実績対比表

添付資料1

様式５（2014.5.22版）

業務実施工程計画・実績対比表

業務名称：　水技術機構アドバイザー（職業訓練需要調査）
対象国　：　エチオピア国

氏名	担当		2015年 5	6	7	8	9	10	11	12	人月 現地計	国内計	合計
衣川　聡子（3号）	職業訓練需要調査	計画		(3) (15) (2)		(22) (2)			(15) (7)		1.73 人月 (52日)	0.70人月 (14日)	2.43 人月
		実績 注 実働日番号		(3) (15) (2) 1 2 3		(22) (2) 4 5			(15) (7) 6 7		1.73 人月 (52日)	0.70人月 (14日)	2.43 人月

■：現地作業
□：国内作業

注　実働日		
1	3日間	国内作業(2015年5月25日～5月27日)
2	15日間	現地作業(2015年6月1日～6月15日)
3	2日間	国内作業(2015年6月16日～6月15日)
4	22日間	現地作業(2015年8月9日～8月30日)
5	2日間	国内作業(2015年9月1日～9月2日)
6	15日間	現地作業(2015年11月20日～12月4日)
7	7日間	国内作業(2015年12月5日～12月11日)

添付資料 2：作業工程表

添付資料2　業務実施工程表

契約履行期間：2015年5月25日～2015年12月25日

	2015年																																			
	5				6				7				8				9				10				11				12								
1．国内準備期間（2015年5月下旬）																																				
①既存資料の収集・整理																																				
②業務計画書（案）作成																																				
③インセプション・レポート（案）作成																																				
④調査項目・コンポーネントの策定																																				
⑤派遣前打合せ																																				
2. 第1次現地業務期間（2015年6月1日～6月15日：15日間）																																				
①エチオピア事務所との打合せ																																				
②類似の労働市場調査結果等の収集・整理 (C/Pと)																																				
③労働市場調査計画の策定（C/Pと）																																				
④ローカルコンサルタント再委託入札図書作成																																				
⑤（エチオピア事務所への）再委託入札に係る引継ぎ																																				
⑥（エチオピア事務所への）現地業務報告																																				
3. 第1次国内業務期間（2015年6月下旬～2015年8月上旬）																																				
①業務進捗報告																																				
②入札に係るエチオピア事務所との連絡調整																																				
③第2回現地業務計画の確認、見直し																																				
④派遣前打合せ																																				
4. 第2 次現地業務期間（2015年8月9日～2015年8月30日：22日間																																				
①エチオピア事務所との打合せ																																				
②ローカルコンサルタント応札状況の確認																																				
③ローカルコンサルタントプロポーザルの評価・選定																																				
④（エチオピア事務所による）ローカルコンサルタント契約交渉の支援																																				
⑤選定したローカルコンサルタントへの調査方針検討支援																																				
⑥EWTIのC/Pへの調査監理技術の移転																																				
⑦（エチオピア事務所への）現地業務報告																																				
5. 第2次現国内業務期間（2015年8月末～2015年11月中旬）																																				
①業務進捗報告																																				
②EWTIのC/Pの現地調査監理支援																																				
③第3回現地業務計画の確認、見直し																																				
④派遣前打合せ																																				
6. 第3次現地業務期間（2015年11月20日～2015年12月4日：15日間）																																				
①エチオピア事務所との打合せ																																				
②ローカルコンサルタント作成の報告書（案）の検査																																				
③アジスアベバ及びアムハラ州バハルダールの関係機関における現場検証の実施																																				
④ローカルコンサルタント業務結果評価・追加業務の検討																																				
⑤EWTIのC/Pへの調査監理技術の移転																																				
⑥（エチオピア事務所への）現地業務報告																																				
7. 帰国後整理期間（2015年12月上旬～2015年12月下旬）																																				
①帰国報告会																																				
②収集資料整理・分析																																				
③業務完了報告書（案）の作成																																				
④業務完了報告会																																				
⑤業務完了報告書の提出																																				
8. 専門家「職業訓練機関運営」との情報共有・協議・調整（全工程）																																				
報告書（成果品）等提出時期					△業務実施計画書（和文） △インセプション・レポート（英文） △入札図書																								業務完了報告書（和文・英文）△ 労働市場調査報告書、収集資料リスト　△											

Inception Report (L/C:Local Consultant)

Interim Report (L/C)

Draft Final Report (L /C)

Final Report (L /C)

国内業務　現地業務
△　成果品等

添付資料 3：カウンターパートリスト

添付資料 3

EWTI 側 C/P リスト

	氏名	職位	備考
Mr.	Zewdu Seifu（主 C/P）	Registrar, EWTI	調査チームコーディネーター
Mr.	Girma Demise	Director of Planning	WS 発表
Mr.	Tamiru Fekadu	Director of Groundwater Technology Directorate	FGD
Mr.	Hailemichael Agdew	Director of Water Supply and Sanitation Engineering Technology	FGD, WS 発表
Ms.	Genezebe Tesfaye	Director of TVET Support Office	初期のみ参加
以下、8 月より参加の若手			
Mr.	Aregahegn Gebremariam	Water Supply and Sanitation Engineer	11 月末ドロップアウト[1]
Mr.	Yonas Tesfaye	Water Resource and Irrigation Engineer	10 月不参加[2]、WS 発表
Ms.	Billy Guta	Senior Communication Expert	9 月退職

[1] バハルダール出張に際し JICA 支給の日当額を不服として。
[2] TVET Support Office の 9 TVETC Needs Survey のチームに引き抜かれたため。

添付資料 4：キーインフォーマントインタビュー相手方リスト

添付資料 4

キーインフォーマントインタビュー　相手方リスト

所属先	職位	氏名
Ministry of Water, Irrigation and Energy (as of June 2015)	Sector Support Directorate Director	Mr. Gebite Geraril
	Water Supply & Sanitation Directorate Director	Mr. Nuredin Mohammed
Federal TVET Agency	Trainee Development & Institutions Capacity Directorate Director	Mr. Azmeraw Kebede Abebe
	Trainees Development Team	Ms. Fikirte Alemayehu
Oromia Regional Water Bureau	Human Resource Process Team Director	Mr. Nemi Soressa
Oromia TVET Commission	Labor Market Research and Trainees Development Process Owner	Mr. Busha Ababu
	Labor Market Assessment Expert	Mr. Tarikku Megesa
	Labor Market Assessment Expert	Mr. Boru Wolde
Wolliso Polytechnic College	Dean	Mr. Teshale Berecha
	Vide Dean	Mr. Zewge Kebede
	Water Department Head	Mr. Melug Allio
Sebata Town Water Supply & Sewage Office (Oromia Region)	Technical Process Owner	Mr. Dereje Tolla
Ethiopian Water Resource Consultant Association	Secretary	Mr. Teshome Afrassa
Ethiopian Drilling Contractors' Association	President	Mr. Estegnet Behre
AG Consult	Deputy General Manager	Mr. Shiferaw Lulu

添付資料 5：収集資料リスト

添付資料5 List of Collected Data and Information

No.	Category	Title	Author /Organization	Year of Publication	Collected Date	Types of Data	Remark
1	General	貧困プロファイル エチオピア	JICA	March 2014	20-May-15	Electric data	only Japanese language is available
2	Water	Water Sector Development Programme 2002-2016	Ministry of Water Resources	2002	12-May-15	Electric data	
3	Water	Private Sector Landscape for WASH in Ethiopia (Bottlenecks and opportunities) Final Report (draft)	Eyob Defere UNICEF	January 2015	20-May-15	Electric data	
4	Water	Water Offices Staff of Oromia Region	Oromia Regional Water Bureau	N/A,but given as "current status"	10-Jun-15	Electric data	Original in Oromian language, translated into English and edited by OPC Corp.
5	Water	An Overview of Drilling Sector in Ethiopia Prepared to Solicit Capacity Building Support	Etsegent Berhe, The Drilling Constructors Association	February 2011	10-Jun-15	Electric data	
6	Water	"Water Sector Labor Market Projection in Oromia Region 2004-2007" (Title translated into English)	(Oromian language)	waxabajjii / 2004 Finfinnee	10-Jun-15	Electric data	Oromian language to be translated by EWTI
7	EWTI	EWTI Profile	EWTI	N/A	9-Jun-15	Electric data	
8	EWTI	EWTI Relationship with Other Organizations	Zewdu Seifu, EWTI	N/A	10-Jun-15	Electric data	
9	EWTI	Course Addmission Requirements	Zewdu Seifu, EWTI	N/A	10-Jun-15	Electric data	
10	EWTI	EWTI Regulation	Federal Negarit Gazette of the Federal Democratic Republic of Ethiopia	August 2013	9-Jun-15	Electric data	
11	EWTI	Final Report on Development of Outcome-based Curricula and Training, Teaching and Learning Materials for Water and Water Related Training Programs at EWTI	AG Consultant	February 2015	22-May-15	Electric data	
12	EWTI	The Groundwater Development and Water Supply Training Project Phase-III Training Needs Assessment Survey Volume I (Report)	EWTEC	June 2009	20-May-15	Electric data	
13	EWTI	The Groundwater Development and Water Supply Training Project Phase-III Training Needs Assessment Survey Volume II (Annex)	EWTEC	June 2009	20-May-15	Electric data	
14	EWTI	The Groundwater Development and Water Supply Training Project Phase-III EWTEC Training Course Impact Assessment Study (Final Report)	Kokusai Kogyo Co., Ltd.	December 2012	20-May-15	Electric data	
15	TVET	エチオピアにおける国家開発戦略としての産業技術教育・職業訓練（TVET）制度改革 -1990年～2010年の政策文書に見るTVETの位置づけの変遷と量的拡大-	名古屋大学大学院国際開発研究科博士後期課程院生 島津侑希	2014	22-May-15	Electric data	
27	TVET	Irrigation and Drainage Designing and Construction NTQF level II and III	Ministry of Education	September 2010	17-Apr-15	Electric data	
28	TVET	Water Supply System Structure Construction and Maintenance NTQF level I, II and III	Ministry of Education	September 2010	17-Apr-15	Electric data	
29	TVET	Electro-mechanical Equipment and Machinery Maintenance NTQF level IV, III, II, I	Ministry of Education	September 2010	17-Apr-15	Electric data	
30	TVET	Waterworks Site Construction Management NTQF level IV	Ministry of Education	September 2010	17-Apr-15	Electric data	
ICB System							
31	TVET	Clustering Guideline	Federal TVET Agency	March 2014	3-Jun-15	Electric data	
32	TVET	Selection of Distinctive Area of Competence (DAC) Manual	Federal TVET Agency	March 2014	3-Jun-15	Electric data	
33	TVET	National TVET Institutional Development Plan (IDP) Manual	Bishoftu, Oromiya Federal TVET Agency	March 2014	3-Jun-15	Electric data	
34	TVET	Improving Effectiveness and Efficiency in TVET Manual	Federal TVET Agency	March 2014	3-Jun-15	Electric data	
35	TVET	Machinries Utilization Guidelines	Federal TVET Agency	March 2014	3-Jun-15	Electric data	
TDT System							
36	TVET	C-Level TVET Trainer's Flooding Manual	Federal TVET Agency	March 2014	3-Jun-15	Electric data	
37	TVET	Directive for Employment and Termination of Foreign Experts (draft)	Federal TVET Agency	October 2014	3-Jun-15	Electric data	
38	TVET	Produce and Utilize Industry Trainers Manual	Federal TVET Agency	December 2014	3-Jun-15	Electric data	
39	TVET	TVET Institutions Leaders' Trainers'Qualification Framework (TILTQFw34w345)	Federal TVET Agency	March 2014	3-Jun-15	Electric data	
Trainee's Devlopment approved system							
40	TVET	The Standard to Monitor and Evaluate Implementation of Cooperative Training	N/A	N/A	3-Jun-15	Electric data	
41	TVET	Non-formal TVET Implementation Manual	Bishoftu, Federal TVET Agency	March 2014	3-Jun-15	Electric data	
42	TVET	Guideline For Inclusion of People with Disabilities in TVET (Draft Only)	Bishoftu, Federal TVET Agency	March 2014	3-Jun-15	Electric data	
43	TVET	Project Based Training Implementation Guidelines	Federal TVET Agency	March 2014	3-Jun-15	Electric data	
44	TVET	TVET tranfer directive F	Federal TVET Agency	(Amhara language)	3-Jun-15	Electric data	only Amharic language is available
45	TVET	Assignment of Committee Members of Joint Plan Implementation in the leading offices of priority sectors	Federal TVET Agency	October 2014	3-Jun-15	Electric data	
46	TVET	List of Institutes and Organizations under Federal Government	Federal TVET Agency	N/A	3-Jun-15	Electric data	
47	TVET	Number of TVET Institutions by region	Federal TVET Agency	N/A	3-Jun-15	Electric data	
48	TVET	Woliso Polytechnic College cluster concept paper background information summary	Woliso Polytechnic College	January 2015	5-Jun-15	Electric data	
49	TVET	Woliso Polytech Response (No.1-No.8)	Woliso Polytechnic College	N/A	5-Jun-15	Electric data	
50	TVET	Demand survey form (Subsector: Water and Irrigation Construction)	Federal TVET Agency	N/A	3-Jun-15	Electric data	
51	Water	English GTP 2 - for Water sector, final draft	Ministry of Water, Irrigation and Energy	July 6th, 2015	1-Sep-15	Electric data	obtained from http://www.cmpethiopia.org/page/10

添付資料 6：ローカルコンサルタント選定用公示 TOR

Terms of Reference (ToR)

Field Survey for Labor Demand of Water Technicians in Ethiopia

1. Introduction

The ratio of the access to clear water is limited in the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia"). As a result, there has been an urgent need for human resource development and operation and maintenance of water supply facilities. In 2005, the Government of Ethiopia has launched Universal Access Plan (hereinafter referred to as "UAP") and revised it as UAP2 in 2011. Under UAP2, it was expected to develop roughly 20,000 engineers by the year 2015.

The Japan International Cooperation Agency (hereinafter referred to as "JICA") had been supporting Ethiopian Water Technology Centre (hereinafter referred to as "EWTEC") to contribute to human resources development as well as organizational capacity development in water sector, under the Ministry of Water, Irrigation and Energy (hereinafter referred to as "MoWIE") of Ethiopia for 15 years since 1998. About 3,500 engineers were trained including international training course participants for other African countries.

EWTEC was assigned as an important human resource development organization under UAP2. It was reorganized as Ethiopian Water Technology Institute (hereinafter referred to as "EWTI"), a Public Institute in August 2013. EWTI is now expected to conduct long-term training courses based on Ethiopian Occupational Standard (hereinafter referred to as "EOS"), as well as training of trainers in technical, vocational and educational training institutions (hereinafter referred to as "TVET institutions") such as TVET Colleges and Polytechnic Colleges, in addition to the short-term training courses for practitioners in water development sector.

In order to design the training program at EWTI, it is necessary to assess the labor demand of the technicians in water development sector (hereinafter referred to as "water technicians") in the labor market who would be the potential trainees of the program. Therefore, the field survey for labor demand of water technicians in Ethiopia is planned.

2. Objective of the Survey

The main objective is to conduct a field survey to collect quantitative and qualitative data on labor market demand of middle-level technicians who work for water sector. Middle-level technicians are possible graduates of TVET institutions who are trained to work for water resources development and water supply in rural and urban settings.

The survey will make the basis of estimating labor demand in both public and private sectors. The revision of training programs at EWTI including development of long-term training courses will be discussed based on the identified the labor demand.

3. Methodology and Technical Approaches

(1) Methodology

The consultant is expected to collect data using a questionnaire by semi-structured interviews by direct interactions, telephone and/or by e-mails.

(2) Close consultation and collaboration

The consultant is expected work closely in consultation and collaboration with EWTI management, the survey team assigned by EWTI, and JICA.

The survey team that lead the whole demand survey consists of the following members:

Mr. Zewdu Seifu, Registrar, Team Leader
Mr. Tamiru Fekadu, Director of Groundwater Technology Directorate
Mr. Girma Demije, Director of Planning
Mr. Hailemichael Aydew, Director of Water Supply and Sanitation Engineering Technology Directorate
Ms. Genzebe Tesfaye, TVET Support Service Head

The consultant is particularly expected to work in technical consultation with JICA advisor for the EWTI survey team.

(3) Communicative monitoring

The consultant is expected submit Inception Report, Interim Report, Draft Final Report, and Final Report. The consultant is required to be in close touch with the EWTI survey team as well as the JICA Advisor, by reporting the progress of survey regularly.

(4) Presentation

At the end of the survey, the consultant is expected to participate in the Demand Survey Result Presentation Workshop in early December, and present the field survey result.

4. Activities and Key Tasks

(1) Plan the survey schedule and finalize sample selection

The Consultant will plan the detail field survey schedule in close consultation with EWTI Survey Team and the JICA Advisor. Draft plan of survey sample selection will be prepared by the EWTI Survey Team and the JICA Advisor. Survey sample selection will be finalized to maximize the efficiency of travel schedule.

(2) Train surveyors, conduct a pre-test, and finalize survey questionnaire

The draft of the field survey questionnaires will be prepared by the EWTI Survey Team and the JICA Advisor in English. Based on the prepared survey questionnaires, the Consultant will train surveyors with the EWTI Survey Team and the JICA Advisor.

The Consultant will conduct the pre-test of the survey questionnaires/tools at several respondents of various groups, and discuss with EWTI Survey Team and the JICA Advisor to finalize the survey tools.

The Consultant will translate the final version of the questionnaire into the local language if necessary.

The Consultant is expected to submit technical proposal including the field survey plan with the draft questionnaire(s), based on the list of planned questions and samples for direct interview (see Attachments of this TOR).

(3) Distribution of the questionnaires to the respondents

The data will be collected with the finalized questionnaire by following methods: by post, by e-mail, and by direct interviews. Since there are a large number of respondents, mail/e-mail survey is planned in addition to the direct interview.

The finalized questionnaires with the letter from EWTI to explain objectives of the survey and to request respondents' cooperation will be sent to all the respondents in Addis Ababa, Oromia Region, Amhara Region, Tigray Region, SNNP Region, Afar Region, Somali Region, and Benishangulu Gumus Region (about 1,000) by post. The list of the respondents will be provided by EWTI Survey Team and the JICA Advisor. The Consultant will contact the respondents to identify the postal address if the list misses some of the postal addresses.

To the respondents who are not the target of direct interviews (about 760), the Consultant will prepare the written instruction to fill the self-administered questionnaire. It must clearly state the deadline for response, owner of the survey, policy on confidentiality, and the Consultant's contact number/e-mail address when there is something unclear. Drafting this message should be consulted with the EWTI Survey Team along with the JICA Advisor. A stamped, self-addressed envelope will be also included so that the respondents can send back the filled questionnaire by post.

To the respondents who are the target of the direct interviews (about 240), the written instruction should request the respondents' cooperation to be ready for the surveyors' visit with the necessary information for the survey.

(4) Make appointments for the direct interview

There are about 240 organizations from government, public and private sectors that are selected to be directly interviewed (see the Attachment 2). The Consultant will make appointments for the direct interview based on the survey schedule in prior to their visit.

(5) Interview the selected government offices, public enterprises, and private enterprises

After the appointments are made, the Consultant will conduct the direct interview to the selected government offices, public enterprises, and private enterprises with the finalized questionnaires. The Consultant also takes photos of their equipment when it is possible. Two surveyors (one is the field supervisor) should make a unit for interview to minimize errors.

(6) Remind respondents for prompt response

When there are not enough responses by mail survey, the Consultant will give reminder calls to the respondents, so that the responses will be sent back as many as possible. If the respondents prefer to be interviewed by phone, the Consultant will interview them by phone.

(7) Collect mail survey responses

The Consultant will collect the filled self-administered questionnaire sent by post. When the respondents prefer to respond by e-mail or by phone, the Consultant will receive the response by e-mail or by phone interview.

(8) Compile direct interview responses of the private enterprises by EWTI Survey Team

EWTI Survey Team will conduct several direct interviews to a part of the selected private enterprises. After completion of the questionnaire, the data will be sent to the Consultant.

(9) Clean data

After collecting responses, the Consultant will check any errors in the datasets and correct them when possible. If a response is found illogical or contradictory in the sequences of the responses, the Consultant will check if the data is correctly recorded. If the problem cannot be solved from the questionnaire, the Consultant will contact the respondent for clarification. If the error cannot be solved, the Consultant should consult with the EWTI Survey Team and the JICA Advisor.
When it is necessary to create an additional code, the Consultant should consult with the EWTI Survey Team and the JICA Advisor.

(10) Create ACCESS Datasets

After cleaning the data, the Consultant will enter the data and create database in ACCESS.
The draft data entry format (in FORM of ACCESS file) will be prepared by EWTI Survey Team and the JICA Advisor. After finalizing the questionnaires, the Consultant will finalize the data entry format accordingly. When there is a need of changing the data entry format, the Consultant should consult with the EWTI Survey Team and the JICA Advisor.

(11) Process and analyze data

After cleaning the data, the Consultant will analyze the data by exporting the data from ACCESS into EXCEL, with appropriate charts and graphs. In addition to the quantitative analysis, the qualitative analysis on the text responses to the open-ended questions is required. The analysis is expected to be credible and logical based on the data collected.

(12) Write survey reports

Based on the analysis, the Consultant will write a field survey report. The report should be effectively presented applying the charts, graphs, tables, and photos.

Before writing the Final Survey Report, the Consultant will write two reports: Interim Report by October 23th, 2015 to report the progress of survey with collected data by that time period. The Consultant will submit the Draft Final Report by November 6th and the Final Report with complete data set and analysis by December 7th 2015.

The Interim Report is expected to include the concrete progress of data collection (list of respondents already surveyed among all), any findings and challenges by that time. The collected data set is also expected to be attached.

For each report, the feedback from EWTI Survey Team with JICA Advisor should be reflected. A part of feedback will be from the field validation by EWTI Survey Team with JICA Advisor.
The Consultant will make the Final Report reflecting all given feedbacks.

(13) Present the output at a workshop

The Consultant will present the outline of the survey report as an output of the field survey at a workshop to be arranged by EWTI in November 2015. The workshop is to present the study results on demand of water technicians in Ethiopia.

5. Output

The Consultant is expected to produce the following deliverables which after approval of JICA with technical endorsement by EWTI and JICA advisor will be linked to payments as shown in the Table 1. The approval will be given when the deliverables meet the timing and quality requirement.

Table 1. List of deliverables and expected timing of submission

Activity	Deliverable	Timing	Link Payment	# of Copies
1	Inception Report	Week 2	30%	7 (print) 3 (CD)
2	Interim Report	Week 10	20%	7 (print) 3 (CD)
3	Draft Final Report	Week 12	-20%	7 (print) 3 (CD)
4	Final Report	Week 17	30%	7 (print) 3 (CD)

All deliverables are should be presented in English in digital and hard copy formats. Raw data should be also included as attachments to the reports.

After submitting all the deliverables and the contract is over, the Consultant must erase any identified personal/organizational information obtained from this survey to keep confidentiality of the respondents.

6. Management, Organization and Time Schedule

The contract will be issued by JICA Ethiopia Office. The Consultant will liaise with EWTI and JICA Advisor for any matters regarding the consultancy work, including both administrative and technical issues.

The Consultant selected to conduct this survey will identify the Team Leader who will supervise completion of the tasks listed in Section 4 and the timely submission of the deliverables listed in Section 5.

The Team Leader will seek inputs from and regularly liaise with JICA and EWTI for all important matters related to this survey throughout the period of its implementation.

The time given for completion of survey is 17 weeks. It is crucial that the completion of the survey is before December 7th , 2015. Start of the survey should therefore be no later than August 17th , 2015. The work plan is shown in Table 2.

The team should be comprised as a maximum of the following members:
Key Staff

- Team Leader: Ameha Addege Girma
  - To supervise the overall survey
  - To organize the survey team, plan and manage the schedule
  - To coordinate with EWTI Survey Team, JICA Advisor, and JICA
  - To train field supervisor and surveyors
  - To maintain the quality of the outputs
  -

- Specialist in social survey / labor survey : Adefris Demissie
    - To train field supervisor and surveyors
    - To validate and analyze data quantitatively and qualitatively
    - To maintain the quality of the outputs
- Specialist in data management : Mesfin Debebe
    - To create datasets for ACCESS
    - To validate, clean data
    - To process data by EXCEL for analysis
    - To maintain the quality of the outputs

Field Staff

- Field Supervisor : Engidashet Bunare Hundie, Getachew Beyene, SemuNigus Ayalew
    - To supervise the field survey
    - To check the questionnaires filled by surveyors
    - To manage collected questionnaires filled by surveyors
- Field Surveyors
    - To conduct questionnaire survey by direct interview under the supervision of a field supervisor
    - To conduct questionnaire survey by phone when the respondent need to be interviewed by phone
    - Make interview appointments for direct interview when necessary

Office Staff

- Telephone Team :
    - To make appointments of the direct interview by phone
    - To give reminder calls to the respondents who are not responding timely
    - To conduct telephone interview to the respondents who need to be interviewed by phone when the surveyors are not available
    - To support Mail Team when necessary
- Mail Team :
    - To send questionnaires to the target respondents
    - To receive and save the responses properly (by making copies and/or scan the filled questionnaire)
    - To urge the respondents to fill and return the questionnaires by phone in collaboration with Telephone Team
    - To support Telephone Team when necessary
- Data Entry Clerks :
    - To enter collected data into ACCESS file
    - To work under the Data Management Specialist for data cleaning

添付資料 6

Table 2. Work Plan

	Key Task	Duration	Aug	Sep* Holiday period included	Oct	Nov	Remarks
(1)	Plan survey schedule and finalize sample selection	3 days	●				
(2)	Train Surveyors, conduct a pre-test, and finalize survey questionnaire	5days	●				
(3)	Distribution of the questionnaires to the respondents	15 days	●	●			Team D+ available members
(4)	Make appointments for the direct interview	15 days	●	●			Team C+ available members
(5)	Interview the selected government offices, public and private enterprises	30 days		●	●		Team A & B
(6)	Remind respondents for prompt response (phone interview included)	20 days		●	●		Team C
(7)	Collect mail/e-mail survey responses	20 days		●	●		Team D
(8)	Compile direct interview responses of the private enterprises by EWTI Survey Team	2 days		●			Team E
(9)	Clean Data	30 days		●	●		All Teams
(10)	Create ACCESS Datasets	35 days		●	●		Data Management Specialist + Team E
(11)	Process and analyze data	10 days			●		Data management specialist
(13)	Workshop					●	Nov. 20th
(12)	Write Survey Reports		△		△ △	△	Inception Report: by Aug. 28st, Interim Report: by Oct. 23th, Draft Final Report: by Nov.6th, Final Report: by Dec. 7th

Field survey team consists of following 5 teams from A. to E.:

A. Addis Ababa Team: 1 Team, Direct Interview for the respondents in Addis Ababa
B. Other Region Team: 3 Teams, Direct Interview for the respondents in Oromia, Amhara, Tigray, SNNP, Afar, Somali, Benishangul Gumus Regions
C. Telephone Team : Making appointments for direct interview, give reminder for prompt response, or phone interview when necessary
D. Mail Team : Preparation, distribution of the questionnaire and collect the filled questionnaire by post
E. Data Entry Team

添付資料 6

A. Respondents for Direct interview: **240**

	Government Water Offices				**Public Enterprises**			**Private Enterprises**			
Region	Regional Water Bureau	Zonal Water Resource Development Office	Woreda Water Offices	Town Water Supply Services	WWDSE (Design & Supervise)	WWCE (Construction)	WWDE(Drilling)	Construction	Consultation	Sanitary works	Drilling
Oromia	1	To be arranged	To be arranged	To be arranged	1	1	1	10	1	0	0
Amhara	1				1	1	1	8	0	0	1
Tigray	1				1	1		6	1	0	1
SNNPR	1				1	1	1	9	1	0	1
Afar	1				1	1		1	0	0	1
Somali	1				1	1		1	0	0	1
Benishangul Gumus	1				1	1		0	0	0	1
Addis Aaba				1	0	0		56	4	1	5
Federal					1	1					
Total	7	104			8	8	3	91	7	1	11
Total by sector	111				19			110			
Grand total											**240**

Representative of the organization, and/or head of technical department and human resources development are to be interviewed.

B. Respondents for Mail survey (or e-mail/telephone response collection) : **760**

Government Offices (Zonal Water Resource Offices, Woreda Water Offices, Town Water Supply Services)	Private Enterprises (Construction, Consultation, Sanitary Works, Drilling)
339	421

The Samples will be selected from above regions and city based on the distribution of the organizations.

添付資料 7-1：労働市場調査報告書（Overall Labor Demand Survey）

Ethiopian Water Technology Institute
Japan International Cooperation Agency

Labor Demand Survey on Water Technicians in Ethiopia

Targeting Seven Selected Regions and Addis Ababa

S.Kurata & EWTI Survey Team
December 2015

Table of Contents

Acronyms

EWTI: Ethiopian Water Technology Institute

EOS: Ethiopian Occupational Standard

JICA: Japan International Cooperation Agency

GTP: Growth and Transformation Plan

MoWIE: Ministry of Water, Irrigation and Energy / Electricity (from November 2015)

RWB: Regional Water Bureau

TVET: Technical Vocational Educational Training

TVETC: Technical Vocational Educational Training Colleges

TWSS: Town Water Supply Service

WASH: Water, Sanitation and Hygiene

WWCE: Water Works Construction Enterprise

WWDE Water Well Drilling Enterprise

WWDSE: Water Works Design and Supervision Enterprise

WWO: Woreda Water Office

ZWRO: Zonal Water Resources Development Office

1. Introduction

1.1. Background of the Study

The ratio of the access to clear water is limited in the Federal Democratic Republic of Ethiopia (hereafter referred as "Ethiopia"). Supply of safe water is important basis in the fields of basic education, health services, and rural development. Under these circumstances, the government of Ethiopia has adopted the decentralization policy, which delivered the authority of local water supply to the regional government. As a result, there has been an urgent need for human resource development and operation and maintenance of water supply facilities. In 2005, the highest national plan in water sector in Ethiopia, "Universal Access Plan (UAP)" has been presented and revised in 2011. Under revised UAP, it was expected to develop roughly 20,000 engineers by the year 2015.

The Japan International Cooperation Agency (hereafter referred as "JICA") has been supporting human resources development as well as organizational capacity development for 15 years since January 1998 until November 2013. The technical cooperation project for 15 years is called "Groundwater Development and Water Supply Training Project: phase I-III." As a result, EWTEC has been functioning as a core human resource development organization in the field of water resource development. In phase III, autonomy of EWTEC has been promoted in order to respond the needs continuously in human resource development in water resources development and operation and maintenance. During these 15 years of cooperation, 3,563 practitioners were trained.

Subsequently, EWTEC has been recognized as a major human resource development organization in Ethiopia by not only the Federal government but other various stakeholders such as regional governments and other donors. Moreover, EWTEC was assigned as an important human resource development organization under UAP. Therefore it was reorganized as Ethiopian Water Technology Institute (EWTI), a Public Institute in June 2012.

It is expected that long training courses based on Ethiopian Occupational Standard (EOS), training of trainers in technical and vocational training colleges (TVETCs), short training courses for practitioners in water development sector are conducted. One WASH National Program also expects that EWTI will provide training to WASH staff, TVETCs and the private sector to increase the availability of skilled personnel to provide services to the WASH sector.

EWTI as well as other TVETCs and Health and Science Colleges are considered as "WASH Training Centers of Excellence." [1]

In order to start the long-term training courses based on EOS, it is necessary to assess the demand of the long-term training. In this way, EWTI has requested a technical cooperation from JICA by having an advisor on demand assessment. The JICA advisor and EWTI survey team members have researched together from June to December 2015 to assess the labor demand of water technicians in Ethiopia.

1.2. Structure of the Study

1.1.1. Objective of the Study

To assess the demand of water technicians in the labor market in Ethiopia, with focus on 7 regions with TVETCs with Water Department and Addis Ababa. The graduates that EWTI's long-term training course based on EOS are considered to become technicians working for government, public and private organizations in water sector.

The outcome of the study is expected to apply training development as well as organizational capacity building of EWTI.

1.1.2. Expected Findings

(1) Current demand (quantitative and qualitative) of water technicians in target regions

(2) Demand projection in coming 5 years

(3) Training needs for short-term trainings of technical employees in water sector (including engineers)

(4) Issues in labor market for water technicians

(5) Issues of long-term training for EWTI to be aware of

(6) Expected service of EWTI

1.1.3. Methodology

(1) Literature review

(2) Field Survey 1: Questionnaire survey conducted by the local consultant

(3) Field Survey 2: Qualitative survey (Key Informant Interview and Focus Group Discussion)

[1] Pp. 78-79, in One WASH National Program: A Multi-Sectoral SWAp Program Document, Final. Federal Democratic Republic of Ethiopia, August 2013.

1.1.4. Study Team Formation

	Name	Position	Remarks
Mr.	Zewdu Seifu	Registrar, EWTI	Team Coordinator
Mr.	Girma Demise	Director of Planning, EWTI	
Mr.	Tamiru Fekadu	Director of Groundwater Technology Directorate, EWTI	
Mr.	Hailemichael Adgew	Director of Water Supply and Sanitation Engineering Technology, EWTI	
Ms.	Genezebe Tesfaye	Director of TVET Support Office, EWTI	Until mid-August
Mr.	Aregahegn Gebremariam	Water Supply and Sanitation Engineer, EWTI	
Mr.	Yonas Tesfaye	Water Resource and Irrigation Engineer, EWTI	
Ms.	Billy Guta	Senior Communication Expert, EWTI	Until September
Ms.	Satoko Kurata-Kinugawa	JICA Advisor on Labor Demand Survey	

2. Socio-economic Background and Water Demand in Ethiopia

Ethiopia has been suffered from drought and influx of refugees caused by the conflict with neighboring countries. However, the country has been enjoying the rapid economic growth around 10 % per year for these 10 years. Growth and Transformation Plan (GTP), a five-year plan 2010/11 – 2014/15, has been implemented followed by the GTP II for another five years. Poverty reduction is also seen with 9.1 percentage point decrease from 2004/05 to 2010[2]. Ethiopia has also been showing progress in human development, such as primary school enrollments, child mortality, and access to clean water. Improve water source, increased from 28.9% in 2000 to 55.4% in 2014 according to the World Data Bank, achieving the Millennium Development Goals (MDGs). The GTPII even reports that the water supply access coverage has reached to 75.5% in urban, 84.1% in rural, and 76.7% in national level as of June 2014.

[2] 38.7% of Ethiopians lived in extreme poverty in 2004/05, and 29.6% in 2010. The World Bank Ethiopia Overview. (http://www.worldbank.org/en/country/ethiopia/overview)

Table1. Key Development Indicators of Ethiopia

Key Indicators	
Population	96,958,732
Population Growth	3%
Urban Population Growth	4.8%
Area	1,104,300km^2
GNI Atlas method (current US$)	55,189,251,158
GNI per capita Atlas method (current US$)	550
GDP growth (annual %)	9.93%
Inflation rate	7.4%
Improved Water Source (% of population with access)	55.4 %
Improved Sanitation Facilities (% of population with access)	26.8%
Water Supply Access (National)*	76.7% (2014)

Source: World Bank, World Development Index 2014. *Source: GTP II.

However, Ethiopia's per capita income, $550 is still categorized in the world's poorest countries, being lower than the regional average. The government continues to tackle the reduction of poverty, aiming to achieve middle income country status by 2025[3].

Promotion of foreign investment and urbanization is seen recently: the foreign capital plants and factories, and condominiums for increasing number of urban residents are being built in suburban area. That recent trend requires more intensive water supplies in urban and suburban area, in addition to the continuous efforts to develop water supply in rural area.

Chart 1. Increasing numbers of condominiums in Suburb of Addis Ababa.
Source: EWTI-JICA Survey Team.

Chart 2. Land preparation by Turkish Plant in Oromia Region.
Source: EWTI-JICA Survey Team.

[3] Laying the Foundation for Achieving Middle Income Status. The World Bank, 2013. (http://www.worldbank.org/en/country/ethiopia/publication/ethiopia-economic-update-laying-the-foundation-for-achieving-middle-income-status)

3. Policy and Plans on Human Resource Development in Water Sector

3.1. Policies of Federal Government

The government of Ethiopia has been making efforts on human resource development in water sector, as "trained manpower will help to improve the quality of decision-making, technical performance, and efficiency in planning and operations at Federal, Regional and local levels," stated in Water Sector Development Programme 2002-2016. The 15 year program had a plan of 7,444.8 US$ millions for the cost of institutional and capacity building for both federal and regional levels. It has contributed to improve the water supply access to achieve 76.7% as of 2014.

On the other hand, one of the main challenges of the water sector is that there was no adequate overall (government, private and community) sub-sector capacity to fulfill and manage the growing water supply demand in line with the socio-economic development of the country[4]. The latest government policy, GTP II, covering from 2016 -2020 has a vision that Ethiopia reaches to a level of lower income country in its socio-economic development by the year 2025. Therefore the water sector GTP II aims to ensure availability of water supply and sanitation services that satisfies the need of lower middle income country's citizens by the year 2020.

The total human resources required for the sector under GTPII is depicted in Table 2. Accordingly, during the planning period overall 527,874 work forces are required of which 4,374 are higher and 13,000 medium professionals and the remaining 510,500 are artisans and care takers.

Table 2: Training and job opportunity creation plan

Sr. No.	**Description**	**Quantity**	**2008**	**2009**	**2010**	**2011**	**2012**
1	Higher professional	4,374	834	885	885	885	885
2	Medium professional	13,000	2,600	2,600	2,600	2,600	2,600
3	Artisans and caretakers	510,000	92,100	92,100	112,100	107,100	107,100
Sum		527,874	95,534	95,585	11,585	110,585	110,585

Note: Year in Ethiopian Calendar.

[4] GPT II, "2.3. Main challenges of the sub-sector."

"Medium professional" here means the technicians that TVETCs are supplying. The long-term training course in EWTI is expected to supply a part of this plan.

3.2. EWTI's Plan for GTP II

Under GTP II, EWTI has launched the following plan. One of the objectives regarding the human resource development is "upgrading the implementation capacity of the sector by improving the capacity of sector professionals and water technology training colleges' trainers in short training and enabling them to join the sector through long term training[5]." The Goal1 under the objective is to train 4,625 technical personnel in which 625 are the water technicians. It is just about 5% of the total 13,000 middle level technicians to be developed in GTP II.

Table 3. Implementation Time Table, EWTI Second Phase Growth and Transformation Plan.

Strategy goal	parameters	Initial 2007	Objectives				
			2008	2009	2010	2011	2012
Goal 1: Creating 4625 trainees to improve manpower supply	The number of manpower trained in short term	219	530	867	869	867	867
	The number of manpower trained in long term		**40**	**146**	**146**	**146**	**147**
Goal 2: Providing professional competency assessment service for 2550 professional to improve training quality	the number of professionals getting competency assessment		-	500	650	650	750
Goal 3: Transferring five suitable technologies	Transferred number of technology		-	-	1	2	2
Goal 4: Undertaking 10 problem solving study and assessment	the undertaking study and research		1	2	3	2	2
Goal 5: Improving the implementation capacity of nine water technology institute training centers in training, technical and consultancy	The number of institute that got support		9	9	9	9	9
	the increase percentage of implementation capacity of the institutes		5	7	10	13	15
Goal 6: Organizing specialized laboratory to increase the laboratory test coverage to eight types and quality to 98%	The implemented type of test in number		-	-	-	6	6
	the obtained outcomes quality in percentage		-	-	-	98	98

[5] Ethiopian Water Technology Institute Second Phase Growth and Transformation Plan (2008-2012). Original in Amharic, translated into English.

4. Labor Market Situation in Water Sector in Ethiopia

4.1. General Labor Situation in Ethiopia

As described in Chapter 3, the economic growth is rapid with 9.93% in 2014. It is supported by booming manufacturing and construction sectors,[6] with growing foreign direct investment. While agriculture, hunting, forestry and fishing sector consists of the largest part---nearly half (45.8%) of the GDP, the share of the electricity, gas and water sector consists of 1.0% of GDP[7].

The inflation rate is 10.0%[8] and urban unemployment rate is 17.5%, therefore the employment and living standard is not better off as the economic indicators imply. Particularly, the most serious unemployment rate is found in the age group from 20 – 24 with 27.4%, followed by the age group of 15-19 with 26.6%. The newly graduates seem to be the most challenged in the labor market, and it would apply to the case for TVETCs. In the case of EWTI located in Addis Ababa, this situation would be even harder, as the regional highest unemployment rate is recorded in Addis Ababa with 21.2 % followed by Amhara Region with 19.0%[9]. It implies that the TVET or EWTI's long-term training based on EOS may not be able to supply the technicians directly to the labor market.

4.2. Previous Situation of Human Resource in Water Sector

"Training Needs Assessment Survey" was conducted by EWTEC in 2009. The report of the survey describes the situation of human resource in water offices in core public sector, public enterprises, TVETCs, private sector and NGO. The survey did not focus only technicians but also engineers and other non-engineering occupation such as sociologists and administrative experts; therefore it cannot be simply compared to this study. However, the summary of finding can be useful to capture the background of the current situation.

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[6] Source: IMF Country Report No. 15/300 (September 2015, https://www.imf.org/external/pubs/ft/scr/2015/cr15300.pdf)
[7] "Ethiopia 2014: African Economic Outlook" (African Development Bank)
http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/2014/PDF/CN_Long_EN/Ethiopie_EN.pdf

[8] Urban unemployment rate as of 2014 and inflation rate as of November 2015. Source: Central Statistical Agency of Ethiopia. http://www.csa.gov.et/
[9] Source of these unemployment statistics: Statistical Report on the 2015 Urban Employment Unemployment Survey. Statistical Bulletin, October 2015, Addis Ababa. Ethiopia Central Statistical Agency.
http://www.csa.gov.et/images/general/news/2015_urban_emp_unemp_survey_2

Table 4. Summary of Labor Demand with Focus on Engineers from Training Needs Assessment Survey by EWTEC 2009

Organization	Current Labor Force	Future Labor Demand
RWB	31 % of the positions were vacant Problem: shortage of experienced professionals, **High rate of staff turnover**	1. Hydrogeologist and related engineers 2.Water Supply Engineer and related engineers
ZWRO	54% of the positions were vacant Problem: shortage of experienced professionals, **High rate of staff turnover**	1. Hydrogeologist and related engineers 2.Water Supply Engineer and related engineers (++)*
WWO	61% of the positions were vacant Problem: critical shortage of professional staff, **lack of practical skills in medium level technical staff**	1. Hydrogeologist and related engineers (++) 2.Water Supply Engineer and related engineers
TWSS	25% of the positions were vacant Problem: **shortage of trained staff, lack of training**	1. Water Supply Engineer
Public Enterprises**	34% of the positions were vacant	1. **Driller** 2. Water Supply Engineer
9 TVETCs***	There were 191 instructors in total. Needs: **practical skill development for instructors**	Major problems: 1. Lack of practical skills of instructors 2. Lack of teaching aids 3. Lack of adequate teaching materials
Private Drilling Companies	Drillers were the largest group. Needs: skill development, training, **supply of driller**	1. **Mechanics** 2. **Driller** 3. Hydrogeologist and related engineers
Private Consulting Companies	Water Supply Engineers were the largest group followed by Hydrogeologist and related occupations. Needs: **training** , software	1. Water Supply Engineer and related engineers 2. Hydrogeologist and related engineers
NGO	Technical Problem: poor study and design, poor construction supervision	

Note: *(++) means the greater degree in demand.
** Public Enterprises includes WWCE, WWDSE and WWDE.
***Bahir Dar (Amhara Region), Maichew (Tigray), Komborcha (Amhara), Awassa (SNNP), Lucy (Afar), Jijiga, (Somali), Asossa (Benishangul Gums), Woliso (Oromia), and Assela (Oromia) with courses in EMT (Electro Mechanical Technology), SSID (Small Scale Irrigation and Drainage), RWSS (Rural Water Supply and Sanitation). See the next chart.

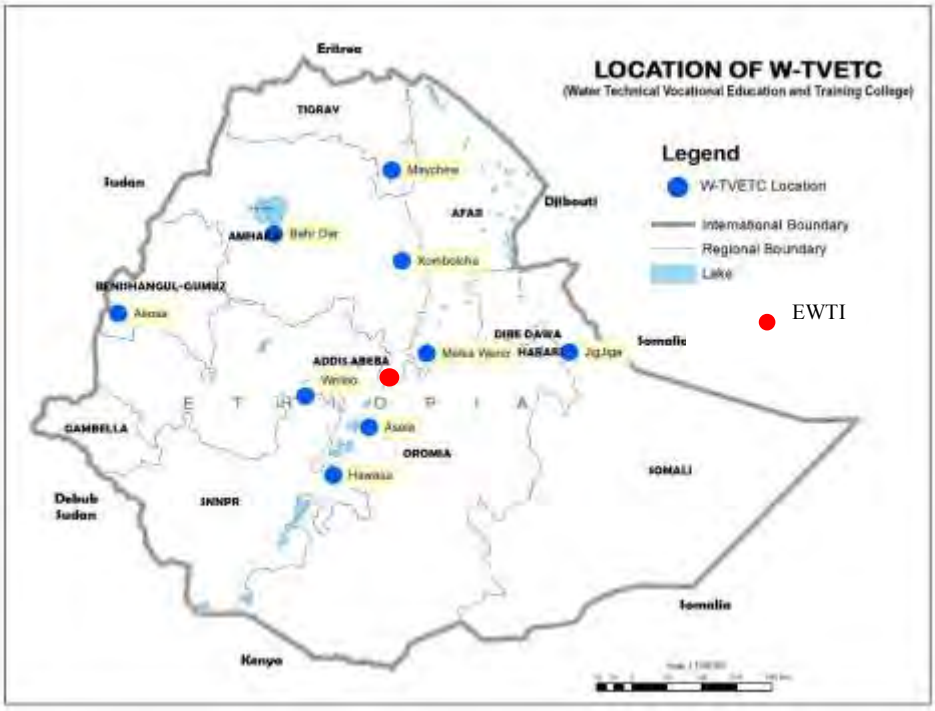

Chart 1. 9 TVETCs with Water Department and EWTI
Source: Edition added the map from Labour Market Demand Survey on Water Technicians in Ethiopia: Final Report, AG Consult.

As for the current staffing in the government sector, more vacant positions were found in Zone than Region, and most in Woreda. In Woreda Water Offices, the lack of medium-level technical personnel was also found. More training needs were found in trainers in TVETCs and private sectors that were not the primary target of the EWTEC training, which was also found in this survey.

As for the future labor demand, the study was focused on engineers, but it was found that driller was in demand in public enterprises and private drilling companies, and mechanic was in demand in private drilling companies. The demand is similar to what we find now.

This study also shows that high turnover found today was already problem in the water sector then.

4.3. Issues from Private Sector

The private sector in water sector in Ethiopia was almost non-existent before 1991 under the government controlled economic system. As the political system had started to democratize, the economic system had liberalized; there came a growth of the private sector. There are more than 1,000 private companies registered at MoWIE today. There are increasing foreign companies; for example, Indian, Chinese, Turkish, or American companies are joining

Ethiopian market. Particularly, drilling business requires large investment; the foreign companies have the strength, availing skilled technical staff from abroad. Thus, the increase of private companies in water sector does not always mean there are more jobs available for the Ethiopian technicians and engineers.

On the other hand, the local companies have to depend on local ones. They compete for few skilled technical staff that is hard to be found[10]. Sometimes the local companies had no other choice employing Pilipino, Indian, Egyptian or American drillers with extra payment. It would require an extra cost of the project.

Although private sector is plays an important role for the One WASH National Program too, there are following challenges in human resource development heard from the sector.

(1) Lack of trained/qualified technicians particularly in rural area

Technicians tend to avoid working in rural or remote areas. Serious lack of local drillers.11 Local drillers did not have proper training and mostly depend on experiences12.

(2) TVETCs are unsuccessful to provide quality graduates

(3) Contractors join water sector from building and construction/road sectors

However they but found it difficult, and some of them leaves.

(4) High mobility in labor market

High staff turnover affects project efficiency (progress, loss of information, etc.)

(5) Lack of training institutions for the private sector

EWTI is the only institution that provides training all in drilling, electro-mechanical, well construction, water supply construction, and drilling machinery maintenance. Particularly, drilling and other drilling technical training would be available only at EWTI[13].

Therefore, the private sector is eager to participate the training if EWTI opens its short-term courses to them. They say they are willing to pay the cost. They expect that training schedule, application requirements, selection criteria are open to the private sector, and notify them at

[10] An Overview of the Drilling Sector in Ethiopia. Estegenet Berhe on behalf of the Drilling Contractors' Association. Addis Ababa, February 2011.
[11] According to the drilling contractors' association, it is very hard to employ a driller, as the supply seems to be scattered, and the young drillers prefers to stay and work in urban area.
[12] According to the key informant interview of private consultant companies.
[13] According to the key informant interview of private consultant companies.

latest 6 months beforehand. They expect that the training offered by EWTI would be attractive to their staff so that it would be able to reduce high turnover.

4.4. Voices from Current Technicians

The EWTI survey team has conducted Focus Group Discussion for three times with the current technicians. The objective is to listen to the "real voice" from the survey target. The job-hunting practice, their reflections on training and education at TVETCs that they graduated, etc. were the focus of questions.

4.4.1. Participants' profile

There were three discussions from August to November 2015 in various occasions. The participants' profile is as follows. Four to five technicians or graduates of the TVETCs freely discussed on the given topic facilitated by EWTI survey team.

Table 5. Participants' Profile of Focus Group Discussions

	At MoWIE	At EWTI	At Bahir Dar Polytechnic
Gender/ Profession	2 Male, 2 Female All technicians	3 Male, 2 Female 2 technicians, 3 engineers	4 Male, 1 Female All instructors of TVETC
Experience	20-30 years	1 – 7 years	10 months to 20 years
Affiliation	2 Private, 2 Public	All government	Electromechanical instructors in Water Department
Occupational field	Water supply, Drilling, Construction	Water supply	Electromechanical/ TVET
Education	2 TVETC, 2 Technical School	3 university, 1 TVETC, 1 Technical school	All TVETC (Bahir Dar Polytechnic graduates)

Chart 3. Focus Group Discussion with the Technicians who came to license renewal at MoWIE

Chart 4. Focus Group Discussion with the short-term training participants at EWTI

Chart 5. Focus Group Discussion with the Bahir Dar Polytechnic Instructors who are also the graduates of the Polytechnic

4.4.2. Summary of Discussion

4.4.2.1. Job Opportunities

New graduates apply jobs through vacancy announcement on newspapers or company communication board. The recruitment may start during apprenticeship (cooperative training) if the trainee has an excellent performance. However, there was no institutional support from TVETCs, therefore job hunting depend on a personal effort.

The graduates after the first career apply jobs through vacancy announcement. Private companies recruit technicians through recommendation. One of the technicians with longer experience tells that the recent trend of the labor market shows less job opportunities of water technicians, because the workers of road and building construction are much more in demand.

4.4.2.2. Personal Reflections on TVET

About 20 to 30 years ago, they found education and training they had at TVETCs lacked relevance to the actual work and skill required. Therefore, they faced more difficulties at workplace compared to the graduates who join the industry recently.

However, even the younger generations of technician also appeals that there still is the big gap from the actual work, especially on software application.

Particularly they found the difficulty in cooperative training. Those are:

- Lack of time: theoretically 70% in cooperative training and 30% in theory at classroom, but in reality only 30% in cooperative training
- More expenses required for transportation, accommodation for the trainees

- Lack of communication between TVETCs and industry
- Lack of trained industry trainers
- Lack of cooperation from industry

4.4.2.3. Availability of Instruments at Workplace

In private enterprises, the instruments lacks due to the financial capacity. In public enterprises, numerous types are available, while some participant tells lack of adequate equipment for urban water utilities. The problem found both in private and public sector is the asset management and financial management due to lack of management skills. Bahir Dar Polytechnic has basic equipment and training materials (with Japanese Official Development Assistance) although not enough to meet the number of trainees.

4.4.2.4. Major Challenges in Water Sector

Following is the most common challenges that the participants found through their occupation.

- Lack of skilled manpower
- Lack of capacity building training
- High turnover
- Lack of technician in rural area
- Professionals changing their field to road and building construction because of low incentives
- Lack of effective utilization of machineries
- Low interest for TVET instructors because of low incentives
- Private enterprises' low interest in safety rules
- Less response from management (private enterprises, polytechnic instructors)

There is a serious problem of shortage of technicians to work for rural water schemes. According to the instructor of Bahir Dar Polytechnic, there was a scholarship program funded by the Ministry around 2003-2010. Children of rural household are admitted to the polytechnic with the Ministry scholarship and studied to become water technicians. After graduation, they returned home and worked in the community, staying with their family. It contributed to maintain rural water supply in better condition.

However, the scholarship had terminated, and the rural children were unable to afford going to the polytechnic in the city. More urban children enter the polytechnic; however, they do not

work in rural area, preferring to stay in urban community. Therefore, nowadays there are more damages left in rural water schemes.

4.4.2.5. Gender Issues among Water Technicians

The participants felt no gender discrimination in the workplace, while in numbers there were much less female than male in the water sector. Female technicians are found in less physically demanding jobs such as water chemist and electromechanical technicians. As the Bahir Dar Polytechnic shows there are more female students than male, the female technicians may increase in the near future.

4.4.2.6. Expectations to EWTI

EWTI was well acknowledged by all the participants. Following is the summary of the participants' expectation toward EWTI's service.

- Demand based practical training
- Prepare a curriculum and training programs which clearly fit with the actual work
- Urban water utility training courses
- Identify potential employers, start a linkage to get employment opportunity

From Polytechnic instructors,

- Refreshment training on practical capacity building, methodology, curriculum and TTLM (Teaching, Training and Learning Materials)
- Equipment and training materials support

4.4.3. Findings and Analysis

(1) Skill Gap

The technicians' skill gap between TVET and real work place do exists. However, the gap seemed larger for the older generation; the refreshers' training courses for the experienced technicians may beneficial. Trainings on asset management, along with financial management may also have a potential needs.

(2) Demand of Skilled Technicians in Rural Area

The scholarship program for the rural children to become water technicians was effective. The selective, focused budget allocation to fill the rural deficit in human resources should be

considered. EWTI will also be able to develop any training that contributes to increase supply of human resources working for rural water schemes.

(3) Job Placement Support

As job hunting depends on personal effort, the first job hunting right after graduation is the most challenging to the TVET trainees. One should be reminded that the TVET does not automatically create as many technicians as required. Given high unemployment rate among youth, job placement service in TVETCs will be very helpful for connecting education and training directly to employment, thus securing human resource development in water sector.

(4) Labor Market Affected by Road and Construction Sector

The quantitative field survey shows there is a large demand in labor market in water sector, and it is growing. However, some technicians may not be that benefitted as more labor demand is found in the expanding road and building construction sectors.

(5) Labor Safety

The industry should make the best effort to keep the labor safety so that the human resource in water sector really can contribute to the sector development. The long-term training course curriculum should also integrate safety issues.

5. Field Survey (Details in the Report by the Local Consultant)

5.1. Survey Methodology and Research Questions of the Field Survey

The questionnaire survey was conducted to assess the labor demand of water technicians in Addis Ababa and 7 target regions where 9 TVETCs with water departments are located. The water offices in government, public, and private sectors were surveyed in 424 samples by the Local consultant. Table 6 shows the response rates.

Table 6. Sampling and Collection Rates of the Field Survey

Sector	Total number of organization	Planned sample	Sampling %	Delivered	Collected	% of Sample	% of Delivered
Government*	868	451	52%	378	311	69%	82%
Public	19	19	100%**	17	15	79%	88%
Private	1059	531	50%	290	98	18%	34%
Total	1946	1001	51%	685	424	42%	62%

*Due to the limited availability of data at the time of sampling, the figure is based on the 2009 data.
**Since there was small number of organizations population survey was planned so that the regional diversity can be included.

(1) Issues about Labor Market Demand

- Current labor market for water technicians (quantity and quality—occupation and level)
- Employment situation
- In-service training availability
- Future projection of labor market (in next 5 years)

(2) Issues about TVET for EWTI to prepare long-term training courses based on EOS

- Experience of cooperative training
- Problems faced in cooperative training
- Plan of future training for all technical employees (both engineers and technicians)
- Expectation to EWTI's service

Details are shown in the attached survey report, "Labour Market Demand Survey on Water Technicians in Ethiopia: Final Report" by AG Consult (see the attached document).

5.2. Summary Findings of the Field Survey

5.2.1. Issues about Labor Market Demand

(1) Current labor market for water technicians (quantity and quality: occupation and level)

In the study, 24,750 employees are working for the 424 responding organizations including managers and supervisors, administrative/clerical and support employees. Of which the technical employees consists of about 44%. In whole target regions, total technical employees are estimated to be 45,211 in Ethiopia.

Out of them, 58% are the technicians followed by the engineers (35%) and assistant technicians (7%). Therefore, technicians are the largest majority of technical employees. Capacity

development of technicians will be necessary and would make a positive change in water sector development.

By job type, excluding the majority of responses fell into "Other" category, the more frequent occupation among technician and assistant technicians found in the surveyed organizations were:

1) Plumber, 2) Mechanic/Drilling Machinery Maintenance Technician, 3) Electrician, 4) Surveyor, 5) Heavy Equipment Operator, 6) Driller, 7) Water Laboratory Technician, 8)Welder.

(2) Employment situation

The technicians are rather young group with the average age, 35 years old. 90% are male, although there is increasing number of female students in the water department in TVETC. Therefore in the future, there will be more female technicians in water sector.

The educational background of the technician and assistant technicians in our sample showed that about 50% of them had "Diploma or TVET Level III". However, 28% of them responding "Other" may have lower educational background than "Certificate or TVET Level I-II". Therefore, there would be quite a few technicians and assistant technicians who do not have proper education and training.

The highest ratio of this category was found among heavy equipment operator, hydrology technician, followed by painter, mason, and carpenter. They may have been working as technicians by practice. The free comment of a town water supply also mentions that "…almost none trained personnel except few job position, they work & operate heavy machines by experience gained from their relative (A response from town water supply)". Therefore, it is important to create training opportunities for this group as soon as possible.

The more frequent challenges faced by technicians in surveyed organizations were 1) lack of skill-upgrading / refreshers' training course followed by 2) lower salary. The labor market problems perceived by the employers were 1) higher salary demanded and 2) Applicants have no knowledge/skill. These matches with the previous findings: the technicians have complaints of lower salary thus demanding higher salary when applying the job, and shortage of knowledge/ skill claims for refreshers' training.

(3) In-service training availability

Engineers, although the proportion within the technical employees was less than technicians, had more in-service opportunities in the past three years among the surveyed organizations.

Namely, water works construction design and study, and related ones, operation and maintenance, electromechanical were more popular among the training subjects.

(4) Future projection of labor market (in next 5 years)

It was found that the demand of foreman or chief level technicians is in high demand, close to the demand of technicians. In sampled organizations, there were 6,374 technicians are planned to be recruited in next five years. If estimated in all over the country, 6,200 technicians in the government sector and 24,248 in public and private sectors would be in demand. In total, over 30,000 technicians are in demand. It is more than GTP II requires, as it includes such various occupations as mason, bar bender, heavy equipment operator, and CAD operators, while GTPII mentions "water supply technicians", "E&M technicians", and "drillers".

Table 3 : Occupation of Technicians with Higher Demand for the Coming 5 Years (424 organization)

	Foreman or Chief Technician	Technician	Assistant Technician
1	Mechanic/Drilling Machinery Maintenance Technician	Plumber	Heavy Equipment Operator
2	Surveyor	Mechanic/ Drilling Machinery Maintenance Technician	Plumber
3	Plumber	Mason	Mechanic/ Drilling Machinery Maintenance Technician
4	Heavy Equipment Operator	Electrician	Carpenter
5	Electrician	Heavy Equipment Operator	Surveyor

5.2.2. Issues about TVET for EWTI to prepare long-term training courses based on EOS

(1) Experience of cooperative training

About 2/3 of the responding organizations had no experience of accepting TVETCs trainees for cooperative training. The shortage of cooperative training heard in Bahir Dar Polytechnic was shown here. There would be insufficient number of organizations that accept cooperative training. EWTI should start looking for their partner soon.

(2) Problems faced in cooperative training

1) Lack of expected skill, 2) lack of expected knowledge, 3) Lack of seriousness was the most common problems mentioned by the managers of the responding organizations.

(3) Plan of future training for all technical employees (both engineers and technicians)

For the future plan, technicians are similarly considered to be the training beneficiary as engineers among responding organizations. This is based on the positive projection of the sales/budget in next 5 years.

The training needs by areas of training are as follows. The bold letters show the areas that can be covered by the existing short-term courses at EWTI.

Table 7. Areas for In-Service Training with Higher Demand (424 Organizations)

	Engineer/ Technical Professional	**Foreman or Chief Technician**	**Technician**	**Assistant Technician**	**Other***
	(BSc and above)	(TVET LEVEL IV)	(TVET LEVEL III)	(TVET LEVEL I-II)	
1	Software	Construction Management & Contract Administration	**Electro-mechanical & machine maintenance**	Plumbing	Water Treatment
2	**Geology & hydrogeology**	Surveying	Plumbing	**Electro-mechanical & machine maintenance**	**Electro-mechanical & machine maintenance ***
3	Construction management & Contract Administration	**Electro-mechanical & Machine Maintenance**	Operation and maintenance	Water Works construction	Administration & Finance
4	**Design of Water Supply Systems**	Plumbing	Water works construction	Operation & maintenance of Water Schemes	Community participation & Water committee

(4) Expectation to EWTI's service

Among five choices of EWTI's service (training of trainers, technology transfer, lab service, technical support, consultancy service), all are similarly in expectation among surveyed organizations.

5.2.3. Implications to EWTI

- Preparation of long-term training courses based on EOS for Drilling and Electromechanical should be started. Collaboration with industry should be started as soon as possible.
- Bold-lettered areas are already able to be covered by existing short-term courses. Based on the urgent needs from Woreda level and private sector, it is recommended to include more of their technicians. Increasing number of Woreda level technicians will contribute to capacity building of rural technicians that is in serious need.
- As for the other demanded areas of training, the higher demanded areas of training have priority to be developed. However, the development of new courses should be cautiously made considering the available resources and division of labor with other training institutions.
- Efficient and effective training management is required. Studying the Demand Survey, announcement of the courses 6 months before start, transparency of application/admission criteria are necessary. Particularly, offering the charged courses for private sector with would be a good source of income as well as motivates EWTI to improve quality of services.

6. Overall Conclusion

(1) The labor market demand of water technicians would be larger than the required number of technicians under GTP II of MoWIE, including wide range of occupations engaged in water sector.

(2) The supply of the new technicians that would be delivered by 9 TVETCs and EWTI may not be able to meet the whole market demand projected, as the whole market demand variety of occupations engaged in the water sector.

(3) According to surveyed respondents, plumbers, mechanic/drilling machinery maintenance, mason, electrician, heavy equipment operator would be in high demand in labor market for the next five years. Although drillers are not ranked high in demand in terms of quantity, due to the scarcity of training institution in the country, there has been a strong demand. Therefore EWTI is expected to provide a long-term training course in drilling.

(4) According to the surveyed respondents, water supply engineer, hydraulics engineer, and hydro-geologist will be in high demand in the labor market of engineers for the next five years.

(5) According to the sample survey, the demand in short-term trainings will be prioritized as:

- For engineers: construction management and contract administration, application software, geology&hydrology
- For foreman/chief technicians: construction management and contract administration, electromechanical & machine maintenance, surveying
- For technician: electromechanical & machine maintenance, operation and maintenance, plumbing
- For assistant technicians, electromechanical & machine maintenance, water works construction, plumbing.

(6) There is insufficiency of skilled technicians in water sector. Both technicians and employers suffer from it. Quality of TVET may not be as good as expected, and there were less chances of in-service training in the private sector.

(7) There are quite a few undereducated/undertrained technicians who do not even have certificate/LEVEL I educational background, which is also in the background of insufficient skilled technicians in water sector.

(8) The job placement practice in the market is mostly on personal effort basis. The youth with less experience, especially the fresh graduates face the difficulty to get employment as employers prefer experienced ones.

(9) There is a lack of supply of technicians in rural area. The special programs to increase supply of technicians working for rural area, e.g., the past scholarship program of MoWIE to rural children to study at TVETCs in their regions had great contribution.

7. Recommendation

The followings are the recommendation based on the whole survey. Most of them are for EWTI, but includes some for other stakeholder(s).

(1) Train the largest group: Technicians are the largest majority of technical employees. Capacity development of technicians is necessary and worthwhile; a positive change in water sector development can be expected.

(2) Beware of a group with less proper education & training: The proportion of those who do not have proper education and training may not be a small group among technicians. In

addition, the older generation of the current technicians found large gap between their training at TVETCs and the real work place. Therefore, the refreshers' training to upgrade skills or to give proper theory and skills is required.

(3) Be selective and focused on developing the long-term training courses: The labor demand of water technicians seems much larger than the government expects. If the economic growth continues, it may be accelerated. Therefore, EWTI should choose the training areas of higher demand with available training resources. **Drilling technology,** although the volume of demand is not large compared to other occupations, definitely one of the areas that EWTI should cover, as no other institution can do.

Electromechanical & Machine Maintenance is another choice, as there are more demand expected in near future, but it should cover from assistant technician to foreman/chief level.

Construction Management & Contract Administration for level IV – may meet the demand of the market as foreman/chief level with management/administration skill.

(4) Cooperative training should be well prepared: As the majority of the organization had not yet accepted TVET trainees, and the arrangement of the training requires much effort, EWTI should start looking for their partner soon. EWTI also needs to institutionally establish partnership with the accepting organizations, not to depend on personal effort of the instructors. Also, EWTI is expected to educate and train the trainees with enough knowledge and skills, with better attitude at the workplace.

(5) Provide institutional job placement support to the graduates of long-term courses: In order to connect training and labor supply in the market, it is strongly recommended to secure job placement for the trainees in the long-term courses of EWTI. It would minimize the unemployed period of the young graduates, thus contributing immediate growth of labor supply of technicians.

Moreover, employment driven training improves the quality of training. The current "passing certificate exam" "passing COC exam" driven training would not secure true marketability of skills and knowledge. The evaluation of the training should be done how many jobs were created.

(6) Provide short training courses to the private sector and Woreda staff: Although basically the short-term training courses were targeted to the government and public sectors in the past, EWTI is expected to actively provide their trainings to the private sector where there is much demand of chances of skill upgrading. It also contributes to generate some income.

If the outcome is evaluated financially it also motivates staff to improve efficiency and quality of services. The private sector also benefits with EWTI's short course, as it is attractive to their staff to work longer.

At the same time, including more Woreda staff in the training courses would contribute to capacity development of rural technicians, although it may not increase them in numbers.

(7) Countermeasures to increase numbers of rural technicians should be developed in discussions of all the stakeholders including MoWIE: There is a serious need in rural area to have technicians. Rural technicians tend to have fewer turnovers, therefore it is worth investing.

(8) Comprehensive human resource development plan of water sector is recommended: As there is an assessment of demand for coming 5 years, there should be a plan of supply to meet the demand. The plan to coordinating quantity and quality (major/competence and levels) of technicians/engineers among various institutions will be very helpful to achieve the goal of GTP II.

(9) MoWIE should be equipped with the latest information for human resource development and labor market assessment, such as numbers of water offices all over the country and number of staff working there. The available data was found in regional government level, but it should be aggregated at the federal level too. At the same time, the presentation of data should be more user-friendly. For example, list of the registered private company should be better organized with exclusion of duplicated data or errors.

(10) EWTI is required to utilize the database constructed with the data collected in this Demand Survey: It would contribute to develop partnership with industry as well as marketing the training courses to private sectors and other clients.

添付資料 7-2：ローカルコンサルタント現地調査報告書（Field Survey Report by Local Consultant）

Japan International Cooperation Agency

ETHIOPIAN WATER TECHNOLOGY INSTITUTE

LABOUR MARKET DEMAND SURVEY ON WATER TECHNICIANS IN ETHIOPIA

FINAL REPORT

December 2015

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Acronyms

AAWSSA - Addis Ababa Water Supply & Sewerage Authority

CSA - Central Statistical Agency

EOS – Ethiopian Occupational Standards

ESDP – Education Sector Development Program

EWTI – Ethiopian Water Technology Institute

GoE – Government of Ethiopia

GTP - Growth and Transformation Plan

JICA – Japan International Cooperation Agency

MoE – Ministry of Agriculture

MoFED – Ministry of Finance & Economic Development

MoWE – Ministry of Water & Energy

MoWIE - Ministry of Water, Irrigation and Electricity

NEP - New Economic Policy

NTQF - National TVET Qualification Framework

NEP – National Employment Policy

PASDEP – Plan for Accelerated Sustainable Development to End Poverty

SA – Self Administered

SNNP - South Nation Nationalities and Peoples

T - Town

TVET – Technical Vocational Educational Training

TVETC - Technical Vocational Education and Training Colleges

TWSSS – Town Water Supply & Sanitation Services

WWCC – Water Works Construction Companies

WWCE – Water Works Construction Enterprise

WWDC – Water Well Drilling Companies

WWDE – Water Well Drilling Enterprise

WWDSE – Water Works Design & Supervision Enterprise

UAP – Universal Access Program

W – Woreda

WB – Water Bureau

Z - Zone

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Survey Team, AG Consult
Ameha Addege Girma, Team Leader

EXECUTIVE SUMMARY

The former JICA- supported Ethiopian Water Technology Center (EWTEC) has been promoted to be The Ethiopian Water Technology Institute (EWTI) in Nov. 2013 as a public training institute. EWTI has been offering short training to water sector employees and professionals working with the government, public and private organizations in the sector.

The Institute is making preparations to launch EOS based long term training in addition to its short training program. In this respect, it undertakes labor market demand survey to capture the demand for water technicians across the sector quantitatively and qualitatively before it launches the program. The graduates of the long term training courses are expected to be the water technicians, and it is important to implement the training courses based on the labor market needs. This Executive Summary addresses how the survey was conducted and the main findings.

The field survey has targeted 1,001 sample organizations from 7 regions and Addis Ababa, where water technicians were employed. These targets were from government organizations (#451), public enterprises (#19) and private companies (#531) all working in the water sector. Either a general manager or a human resource director of the organization was the respondent in the survey. Out of the target organizations (1,001 Organizations), 424 respondents have been able to fill out the questionnaire and retuned them for subsequent analysis.

Under the government organizations the Regional Water Bureaus, Zonal Water, Irrigation and Energy Offices, Woreda Water, Irrigation and Energy Offices, and Town Water Supply and Sanitation Service Units are included. Under Public there are Water Works Designs and Supervision, Water Works Construction and Water Well Drilling Enterprises. In the Private Sector there are Construction, Consultancy, Sanitary Works and Drilling Companies.

A semi-structured questionnaire was prepared for data collection. There were face to face interviews (direct interview) among selected respondents while other respondents were provided with the questionnaires so that they can fill them out themselves (Self-Administered Questionnaires). Observations and document reviewing have also been applied as part of data collection methods.

The profile of respondents who have actually filled out the survey questionnaires (424) shows that most of them work with the government sector followed by the private and public sectors by

order of number of respondents respectively. Male dominance over female was observed while most organizations that respondents represent were established since the year 2000 and are almost all local.

The profile of employees was then assessed by occupational categories and shown by region, by sector and by type of organizations. There were four categories of employees currently employed among the responding organizations. These include managers/supervisors, technical, administrative/ clerical and support employees. It was found out in the survey that technical employees took the largest in number among the other categories.

Technical employees are further disaggregated into three components. These are engineers or technical professionals, technicians and assistant technicians. Among the technical employees, technicians were found to be dominant in terms size of number. The number of technicians among the responding organizations were found out to be 6,002 (58%) while engineers were 3,651 (35%) and assistant technicians 757 (7%).

The profile of technicians by Job Type showed that the number of plumbers, mechanic/drilling machinery maintenance technicians, electricians, surveyors and heavy equipment operators employed outweighed others by size of employment. When it comes to educational profile, some 50% of technicians possess diploma or TVET level III qualifications. By age group the majority of technicians were found to be below the average age group(40 to 44).

When it comes to the challenges faced by technicians, lack of skill upgrading training remained the most significant challenges faced followed by lower salary level. By the side of employers, the labor market problems was explained in terms of absence of adequate knowledge and skill on the part of job seekers followed by higher salary level demanded as factor that affected employers motive to hire more.

It was also found out that less than half of the respondents have been able to provide in-service trainings to their employees and that more engineers happened to be the major beneficiaries of such short trainings than the technicians.

Organizations have also been positively indicating their future sales or increase in budget for the coming 5 years: almost 90% of the respondents have projected growth in budget or sales by more than 5%, which will provides opportunity for further training of employees. Although engineers

were found to be the major beneficiary of future trainings, technicians will have greater chances of trainings compared to the past.

Demand for technicians all over Ethiopia for the coming five years is estimated to be in the order of 31,144. On the other hand in GTP II the demand for technicians and other mid-level professionals stands at 13,000 while for high level professionals is 4,374.

The core findings are:

1. Technicians are among the major employment groups that are found in water sector organizations
2. Future prospect for training is good especially for engineers and technicians.
3. The demand for technicians is estimated to be high.

Thus, EWTI will have sufficient demand to undertake training for technicians and engineers. The survey indicated lack of well skilled and knowledgeable technical personnel. Therefore, EWTI is required to design its training in order to produce technicians to the required level of skill and knowledge in order to fill the gap in well trained technicians in the water sector.

1 Introduction

1.1 Background of the Study

This Report focuses on an assessment of labor market demand for Water technicians. Water technicians are graduates of Technical Vocational Education and Training Colleges (TVETCs), Institutes and other training centers working in Ethiopia with various qualifications. In spite of the fact that they differ in qualifications they possess, all are trained to work in water resources development and water supply in rural and urban settings.

There is generally scanty information on labor market situation of water technicians on both the supply and demand sides. Where they are found, they can be tapped to tell the situation but with great caution. The Universal Access Plan (UAP) estimates that there is a national capacity gap of approximately 8,000 graduates and 18,000 technician posts. It is clear that the capacity building needs are enormous in terms of both the sheer numbers of staff required and the range of different skills and competencies to be covered[1]. Training needs survey revealed that 15,000 sector professional need skill upgrading with practical trainings[2]. The government attention for training of water technicians and engineers has remained great. The UAP 2 states that 20,000 engineers are expected to be trained within the plan period[2].

EWTI in collaboration with JICA has initiated labor demand survey for water technicians as a necessary first step towards designing training program. This is in line with TVET Policy and Strategy. TVET Policy and strategy emphasizes that training is demand driven and that certification is based on labor market analysis[3].

The labor market demand survey is a step in the direction of fulfilling the policy and strategy of the Ethiopian government. Accordingly PASDEP envisages TVET to provide the necessary "relevant and demand-driven education and training that corresponds to the needs of economic and social sectors for employment and self-employment".

To this end a semi structured Questionnaire was designed and tested and field supervisors and surveyors were trained for the survey. The survey methodology has identified two types of data collection approaches. These are Direct Interview and Mail Survey (which is now named Self-

[1] Andrew Cotton and Frank Odhiambo, July 2007
[2] UAP2
[3] ESDP IV- 2010/11 – 2014/15

Administered (SA) Survey). The part on the SA survey expects respondents to fill out their responses to the survey questionnaires themselves with minimum support and guide by mail survey support team members.

Sample respondents were identified to participate in the study across seven regional states, Addis Ababa City and Federal Government. These identified respondents were drawn from government, private and public organizations working in the water sector as shown in the table below.

Table 1. Summary of Samples by Sector, Region, and Survey Methods

Regions	**Gov't Water Offices**		**Public Enterprises**		**Private Enterprises**		**Total**
	Direct	SA	Direct	SA	Direct	SA	
Addis Ababa	1	0	0	0	66	252	319
Federal	0	0	2	0	0	0	2
Oromia	35	150	3	0	11	42	241
Amhara	23	80	3	0	9	34	149
Tigray	14	21	2	0	8	31	76
SNNPR	18	74	3	0	11	42	148
Afar	11	5	2	0	2	8	28
Somali	4	5	2	0	2	8	21
Benshangul	6	4	2	0	1	4	17
TOTAL	**112**	**339**	**19**	**0**	**110**	**421**	**1,001**
Direct Interview							**241**
SA							**760**

Source: Labor Market Demand Survey Inception Report, Aug. 2015

The targeted organizations (respondents) from the three sectors are given below.

A. Government Organizations

1. Regional Water Resources Bureaus
2. Zonal Water Resource Development Departments
3. Woreda Water, mines and Energy Offices
4. Town Water Supply Services

B. Public Enterprises

1. Water Works Design & Supervision Enterprise (WWDSE)
2. Water Works Construction Enterprise (WWCE)
3. Water Well Drilling Enterprise (WWDE)

C. Private Enterprises

1. Construction Companies
2. Consulting Companies
3. Sanitary works Construction Companies
4. Water Well Drilling Companies

Four survey teams were created to work as supervisors and surveyors as shown in the table below.

Table 2. Survey Teams by Regions and Number of Respondents

Survey Teams by Survey Regions	Respondents for Direct Interview	Respondents of Mail Interview
Addis Ababa and Federal	69	252
Oromiya & Benishangul Gumuz	56	200
Amhara and Tigray	57	166
SNNP, Afar and Somali	59	142
Total Number of Respondents	**241**	**760**

Source: Labor Market Demand Survey Inception Report, Aug. 2015

There are other Teams involved in the survey process. These include:

I. Mail Team – Team 5 with 3 members
II. Telephone Team – Team 6 with 3 members
III. Data Entry Team – Team 7 with 3 members

The following tasks were accomplished prior to the beginning of the field level survey on September 02/2015.

i) Reviewing and refining the survey questionnaire so that it becomes simple, clear and manageable that addresses the very objective of the project and considering the kind of respondents the survey is going to face. This was done in collaboration with EWTI and under the guidance of the JICA advisor.

ii) Two day training on August 21 and 24 was organized to supervisors, surveyors and all other support staffs working with telephoning, e-mailing, data encoding and other similar works. Highlights were made on the need of the labor market demand survey, target respondents and geographical locations, attitudinal and behavioral issues associated with the tasks of surveying.

The training has also included data base approach where participants were introduced to the data base and approach and its use. Team members from EWTI have also attended the training as they are expected to join the survey.

At the end of the training, it was also possible for participants to discuss on critical issues of survey questionnaire and anticipated problems associated with it and other concerns of participants. It was decided then to simplify the questionnaire and make it user friendly for acquiring optimum result.

iii) Pre-testing the questionnaires has also been another pertinent task accomplished on Aug. 25 to 26 which covered 8 organizations in Addis Ababa, which includes government, public and private, in the direct interviewing mode. 4 teams /all supervisors and surveyors have taken part in this important task. In the aftermath of this task, it was possible to improve the survey questionnaire and get the necessary experience for the imminent field level survey duties.

iv) A half day training was organized on how to use "Access Data Base" for data entry clerks with particular focus on data entry, review and feedback.

1.2 Statement of the Problem

Consistent with TVET strategy, training institutions are expected to assess labor market demand before they officially launch a training program. Hence this survey was planned to answer the following research queries and provide what is there on the ground with regard to labor market demand for water technicians.

a. What is the labor market demand for water technicians? What is the trend in the future?
b. How many technicians and engineers are there in the labor market in the water sector?
c. What are their occupations and levels?
d. What is the educational background of technicians? Are they from TVETCs?
e. What is their demography? Are they young or old, male and female?
f. What are the challenges faced by employers and technicians alike at workplaces
g. What are the employment problems organizations faces?
h. What is the extent to which in-service training is demanded by technicians and engineers?

i. How can EWTI meet training needs?
j. What are water sector expectations from EWTI?
k. The likely business projections or future plan and implications on demand and training?
l. What Operational capacities of equipment, tools and software are frequently needed in the market?
m. Training Plans among employers?

1.3 Survey Objectives

EWTI in collaboration with JICA has got the following objectives

- To conduct a field survey among government water offices, public and private enterprises in the water sector to collect quantitative and qualitative data on labor market demand for middle level water technicians who work for the water sector;
- Estimate the labor market demand for water technicians in both the government, public and private sectors based on the survey findings;

1.4 Significance of the Study

EWTI's action to examine the demand for water technicians is superb. On one side it is an obligation to embark on such a study as TVET strategy requires this action for accreditation. On the other hand, it is important for the Institute to clearly see where the demand lies and then take appropriate action to design training programs. It saves resources and increase reputations when courses that are demanded by the market are provided.

The result from the labor market demand survey for water technicians is supposed to benefit EWTI and all organizations involved in water sector activities. Specifically for EWTI the significance of the survey can be explained as follows. These are:

- To have baseline information and data about government organizations, public enterprises and private companies that are involved in the water sector activities,
- To estimate the existing number of water technicians in the sector and their basic demographic and employment conditions,
- To understand the major challenges being faced by water technicians in their respective organizations and also see employers' market challenges for labor,

- To be aware of the possible partners of cooperative training as well as challenges within cooperative training
- To understand the future trend in the demand for training service for water technicians,
- To estimate the demand for water technician in the sector for the coming five years,
- Ultimately to prepare implementable strategic plan of training services demanded by water technicians with the idea of reducing the prevailing skill gap and contribute to sector development in line with GTP 2.

1.5 Scope of the Survey

The Key tasks include:

- ❑ Plan the survey schedule and finalize sample selection,
- ❑ Train supervisors and surveyors and other support staffs,
- ❑ Conduct a pre-test of the questionnaire prepared and finalize the survey questionnaire,
- ❑ Distribution of the questionnaire to the respondents ,
- ❑ Make appointments and conduct direct interview with representatives of government, public and private enterprises ,
- ❑ Remind respondents of self-administered questionnaires for prompt responses ,
- ❑ Collect mail survey responses,
- ❑ Clean data,
- ❑ Create Access Database,
- ❑ Process and analyze data,
- ❑ Write Survey Reports following the Interim report and Draft Final reports, and
- ❑ Present the Output at a workshop

1.6 Limitations of the Study

The following limitations can be mentioned as it might help to overcome issues contained as limitations in future engagements.

- Lack of reliable secondary data related to the past and present situations of water technicians in country,
- There were limitations to keep perfect 'randomness' in sampling owing to the fact that there was limited time frame available to travel to faraway places from the main road and, therefore, remote/ very rural organizations were not able to be included. Thus there was a possible sampling bias in the survey
- Data cleaning was almost a simultaneous process and ended with data collection,
- The cooperation from the private sector particularly from construction companies has been very low. It should be noted that construction companies have had huge representation as respondents in the sector,
- Lack of experience of undertaking survey through email and telephone contacts have caused troubles to collect responses on time,
- Lack of seriousness on the part of some respondent to provide answers to all the questions asked. Some variables as age and salary are considered secret and respondents were less likely to respond. These problems have got serious implication in the analysis of the findings, and
- The size of the survey questionnaire was a bit large for the kind of respondents involved in the labor market demand survey.

1.7 Organization of the Study Report

The report is organized in eight Sections. **Section 1** provides introduction to the survey where survey background, statement of the problem, objectives, scope of the survey and Organization of the study report are treated. Review of literature comes under **Section 2** while **Section 3** deals with Survey methodology where target population and samples, survey areas, sources of data and data collection methods including sampling methods and data analysis methods are all described one after the other. **Section 4** provides Survey Areas where places and locations of the different survey sites are explained with the help of maps. Data presentation and Analysis are covered in **Section 5**. **Section 6** deals with Existing Equipment and Software. **Section 7** deals with Respondents Free Comments**.** Finally, Conclusion and Recommendations are provided in **Section 8**.

2 Review of Literature

2.1 Labor Market Demand in Ethiopia

"Labor Market Demand" refers to the need for employees and workers in a particular job market. According to Ethiopia's National Employment Policy and Strategy (NEPS) (2009), employment generation has two important dimensions - the demand and supply side of job creation. The first dimension (*the demand side of job creation*) refers to the ability of the economy to create jobs for various skill categories as per the requirement of the economy. The second dimension (*the supply side of job creation*) deals with whether or not the skill levels of available pool of persons match with the type of skill that the economy requires. Besides, there is a third dimension (i.e. labor market institutions) that relates to the governance of labor market relations and labor market services[4].

Demand side of job creation

A comprehensive strategy of employment creation seeks to promote job creation in the private sector, in the public sector, and also in terms of promoting self-employment and entrepreneurship in urban and semi-urban areas. Accordingly, the NEP of Ethiopia identified policy action areas pertaining to the demand side of employment generation as: Accelerating private sector development for employment generation; and ensuring effective and efficient public sector employment

Supply Side of the Labor Market

The supply side of job creation deals with whether or not the skill levels of available pool of persons match with the type of skill that the economy requires. Basically, it is concerned with improving and raising labor productivity, which can be achieved mainly through education and training. The Ethiopian education system in the 1980s was theory-oriented without due emphasis to vocational and technical trainings and thus it did not help students to improve their cognitive skills and motivate them for success[5].

In 1994 a new education policy that dramatically changed the education system was introduced and adopted taking into consideration the limitations of the previous educational system. The new education policy focuses on producing a skilled labor force rather than a large cohort of

[4] (NEPS) (2009),
[5] MOE, 2002

relatively unskilled secondary school graduates. Those who do not score well enough to continue in secondary school have the opportunity to pursue formal Technical and Vocational Education and Training (TVET), which takes from one to three years.

At the moment there are vocational and technical training centers which turn out technicians in various fields of studies. On the same footstep the Water sector has established TVET Colleges to meet the ever increasing demand for mid-level technicians in the sector.

It is important to note that the pressure on the labor market comes from the supply of labor rather than demand driven, which is in turn induced by the growth rate of the population. (GOE, 2002)

The strategy of MOFED clearly stated that when all middle level TVET training programs are based on labor market needs, training programs can be demand-driven and meet the needs of local or regional employers. The strategy further explained that TVET institutions design their own courses and programs by conducting a labor analysis and follow up with a Gap Analysis of the training entities in the country or region through discussion with stakeholders for all areas of TVET training methodologies or curricula to meet the market needs[6]. To this end, it is important to develop more viable TVET programs by using labor market information (current and potential labor market) to identify and design courses as well as methodologies for training before investing the country's scarce resources.

2.2 Training of Water Technicians

2.2.1 Water Works Technical Vocational and Education Training

The Ministry of Water and Energy Resources has launched the Water Works TVET training programs in 2002. In doing so it was sought to address the following objectives[7].

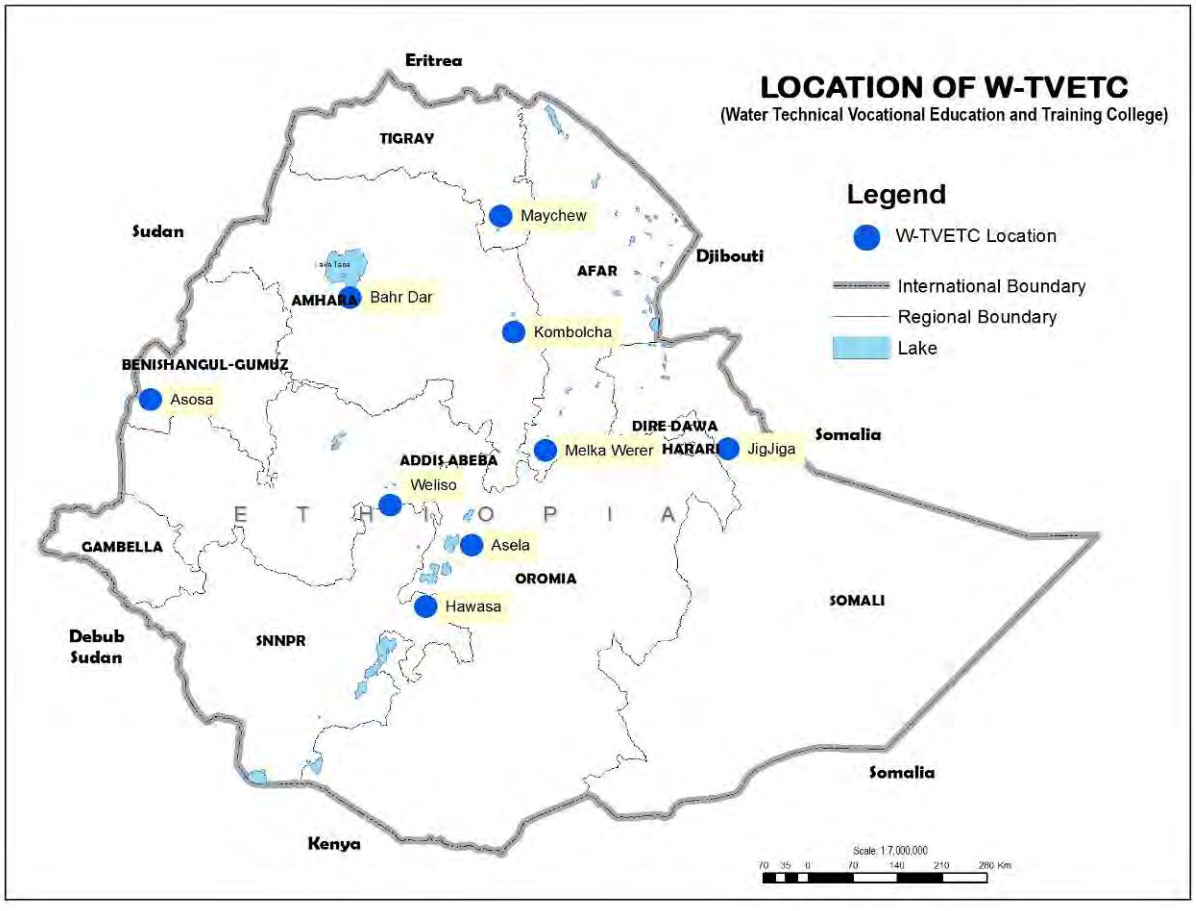
- To facilitate the growth in water and sanitation coverage;
- Fill the skill gaps of technicians engaged in the water sector and thereby raise the number, competence and qualification range of technicians to ultimately strengthen the national capacity in the sector;
- Provide demand driven and reliable skills' upgrading and updating training to technicians and other employees of the sector

[6] MOFED, 2010
[7] MoWE. (October, 2012)

The training programs have started with 4 training centers and 424 trainees. Currently there are 9 TVET Colleges spread in 7 regional states as shown in the map below. These Colleges were able to train 10,000 mid-level technicians[8].

Although the entire TVET system including training delivery has now been completely taken over by the Ministry of Education (MoE), the Ministry of Water and Energy (as it now called Ministry of Water, Mines and Electricity /MoWME/) continued providing technical and material support in collaboration with different international donors. The same report (MoWE, Nov 2011) has continued to suggest that by increasing small scale irrigation and water supply and sanitation services TVET program has been playing multifaceted roles in improving food security among citizens as well as maintaining the development of the country.

The locations of Water Works TVET Colleges are shown in the map below.



Source: Processed by Ag Consult Survey Team

Figure 1. Map Showing Location of Water Works TVET across the country

[8] MoWE, Nov. 2011

2.2.2 Ethiopian Water Technology Institute

To overcome the shortage of trained human power in the water sector, the government has also established Ethiopian Water Technology Centre in 1998 in collaboration with JICA[9]. With the request of the former MoWE, the government has upgraded the center to an autonomous public institution known as "Ethiopian Water Technology Institute" to enhance output in the area of water sector study and development.

EWTI was established as a public training institute in Aug 2013 replacing the former EWTEC. The Institute has not yet embarked on delivery of long term training but rather making preparation to launch such training.

One and indispensable step it this direction is the Labor Market Demand Survey of Water Technicians that it has to undertake prior to the start of the program.

The Institute plans to offer EOS based long term courses in its regular program. The plan envisages embarking on the delivery of Levels 4 and 5 while other TVET Colleges training in water provide Levels 1 to 3 which are determined by NTQF. However, there are exceptions to this. There are courses EWTI delivers right from Levels 1 to 5 by itself. These include water well drilling & construction and electro-mechanical equipment & machinery maintenance.

EWTI is active in the delivery of short term training at the moment. Continuing with the footsteps of EWTEC, the Institute provides the following courses in its short term program. These are:

- Basic Courses – which run from 8 to 12 weeks
  - Groundwater Investigation
  - Drilling Courses
  - Drilling machinery Maintenance Technology
  - Water Supply Engineering
  - Electro-Mechanical Maintenance Technology
- Advanced courses – run from 2 to 3 weeks
  - Groundwater Modeling

[9] Center of Excellence, EWTI

- Well Diagnosis/Well Rehabilitation
- Hydraulic System Maintenance
- Remote Sensing
- Geographic Information System (GIS)
- Isotope Hydrology

❖ Training for TVET – Run from 2 to 3 weeks

These training are given to both TVET Instructors (at EWTI) and Students (at each TVETCs)

❖ On-demand Courses – run from 2 to 4 weeks

- Hand Pump Installation and Maintenance
- Machinery

The main beneficiaries of the training program have been Regional Water Bureaus. However, TVETCs, public enterprises, the private sector and others do benefit from the trainings.

The accomplishments of EWTI since its establishment as a public Institute can be verified by looking at the accomplishments of the Institute in GTP 1[10]. As EWTI was established in 2013, the planned achievements with regard to GTP 1 were a continuation of training from EWTEC.

IN GTP 1 which covered the period 2010/11 to 2014/15, the accomplishments of the Institute in terms of short term training provided to water sector professional and technicians can be seen from the following table.

Table 3. Plan Vs. Actual Accomplishment of GTP 1 in training of Water Sector Professionals and Technicians

Fields of Training	Training Plan	Actual	Accomplishment (%)
Basic Courses	1,323	1,310	99%
Advanced Courses	271	271	100%
On-Demand Courses	60	60	100%
Training for TVETCs	34	34	100%
Training of TVETCs Trainees	-	465	

Source: GTP 1: Ethiopian Water Technology Institute, 2015.

[10] GTP (2010/11 – 2014/15)

The last training in basic courses were given to TVET instructors from the various Water departments while basic and advanced courses were directed to regional and city Administration's technical and professional employees.

In GTP 2 it is planned to train 4,625 sector professional and technicians from government and non-government organizations including the private sector.[11]

2.2.3 National Capacity Gaps for Water Technicians

There are different studies that testified to the existence of gaps in the availability of technicians. It was to fill the skill gaps of technicians engaged in the water sector and thereby raise the number, competence and qualification range of technicians to ultimately strengthen the national capacity in the sector that led to the start of EWTEC and Water Works TVET training programs.

As stated in the background section of this paper, the UAP estimates that there is a national capacity gap of approximately 8,000 graduate and 18,000 technician posts. It is clear that the capacity building needs are enormous in terms of both the sheer number of staffs required and range of different skills and competencies to be covered.

Having emphasized the need for human resources development, GTP 2 has indicated 527, 874 workforces required by the water sector for the plan period. The table below depicts detail breakdown in the demand for labor.

Table 4. Training and Job Opportunity Creation Plan, GTP 2, January 2015, Addis Ababa.

Sr. No.	Description	Quantity	2015/16	2016/17	2017/18	2018/19	2019/20
1	Higher Professional	4,374	834	885	885	885	885
2	Medium Professional	13,000	2,600	2,600	2,600	2,600	2,600
3	Artisans and Caretakers	510,500	92,100	92,,100	112,100	107,100	107,100
	SUM	**527,874**	**95,534**	**95,585**	**115,585**	**110,585**	**110,585**

Source: GTP (2015/16 – 2019/20)

By medium professional it is meant to refer to water technicians, electromechanical technicians, drillers and others while higher professional include water engineers, geologist, hydro-geologist, hydrologists, electromechanical Engineers, Sociologist, Economists and others.

[11] GTP (2015/15 – 2019/20)

It is planned that higher and medium professionals would be trained by government and private sector universities and colleges while artisans and care takers by regions, zones, woredas and Woreda WaSH Consultants (WWCs). Moreover, the JICA supported EWTI is considered to provide training in borehole drilling and other relevant skills.

3 Survey Methodology

3.1 Target Population and Sample

The target populations of the labor market demand survey are organizations working in the water sector in the target regions of the survey. These are Government, Public and Private Organizations that are engaged in the sector in different activities and with different responsibilities and create various job opportunities for technicians and assistant technicians. The total number of responding organizations (sample frame) in the target regions and the corresponding sample sizes are shown in the following table.

Table 5. Size of Population and Samples

	Number of Total Organizations (A)	Number of Total Organizations(A')			Sampling Rate
		available data at sampling time (A')	(A') composition of each sector	Number of Samples (B)	Composition within sample
Government Organizations	1,221	868	45%	451	45%
Public Enterprises	19	19	1%	19	2%
Private Enterprises	1,026	1,059	54%	531	53%
Total	**2,266**	1,946	100%	**1,001**	51%

Note:
(A'): "Number of Government Organizations" data was 2009 data that was the only available comprehensive data at the time of sampling planning. Later on, the latest data was available shown as (A).
(A') "Number of Private Enterprise" data was 2014 list registered at MoWIE available at the time of sampling planning. After excluding error duplications from the list, it turned to be (A) data as 1,026.
Source: Labor Market Demand Survey

Representation of the sample is not equal as one can see since there would be little sample drawn from the public sector if stratified sampling is strictly applied. The public enterprises in Ethiopia has played a big role in employment of technicians, therefore we decided to interview all of them. The private sector is slightly more than the government sector in the rate of sampling.

Government organizations are further classified as Water Resources Development Bureau at regional level which is responsible for the overall water sector activities across a particular region. Below are, in a hierarchical fashion, Zones Water Resources Development Departments

and Woreda Water Resources, Mines and Energy Offices which work in different capacities and responsibilities within the sector. Of course Woredas are very close to user communities with great responsibility and accountability over water supply and sanitation and small scale irrigation.

There are water utility offices (Town Water Supply and Sanitation Services) at town level which are run by Water Boards and are responsible for water supply and sanitation at town level. There are also Water Committees which are responsible over water supply at small towns or villages of rural nature. These are excluded from the target population as the level of wage employment they generate for water technicians is very small.

There are public organizations which work in different activities within the water sector. They are essentially engaged in water works construction, water well drilling and water works design and supervision. Although these organizations are small in number, they provide wide employment opportunities for technicians and assistant technicians in the sector.

The private companies are construction, consultancy, drilling and sanitary works construction companies which account for the major part of their involvement in the sector.

3.2 Data Collection Method

A semi-structured questionnaire was developed which mainly consisted of questions related to organizational profile, number of employees by category, number of technical employees by professional category, profile of technicians and assistant technicians, challenges for technicians and assistant technicians, employment problems of technical employees, in-service training, cooperative training, business projections, expected services of EWTI, recruitment plan for technical employees for the next five years, equipment and software, respondents and surveyors free comments in order to understand the good and bad sides of the questionnaires and what needs to be done as a complement for the future. The General Manager or Human Resources Director was the expected respondent on-behalf of the responding organizations.

Interview:

Both quantitative and qualitative data collection methods were employed for data collection. . This refers to the semi structured questionnaire. The survey methodology indicates the existence of two types of data collection approaches. These are Direct Interview and Self-Administered Questionnaires (SA). SA was applied with the purpose of reaching out as many respondents as

possible across the survey regions as direct interview can cover limited number of respondents. While direct interview is undertaken by face-to-face by surveyors, the part on the SA survey expects respondents to fill out their responses to the survey questionnaires themselves with minimum support and guide by mail survey support team members.

Observation:

Physical observation is one of the methodologies applied to collect data. This method applied for collection of data concerning equipment. In most cases data collection with equipment has been accompanied by list of the materials that the different responding organizations attached separately. In addition observation and pictures taken has also helped to assess the work environment and conditions of the different organizations.

Document Reviewing:

Document reviewing has also helped to gather additional information from various secondary sources on labor market demand, TVET strategy, and other relevant information that have supported the process of analysis and provide concrete pictures on the findings of the survey.

3.3 Sampling Method

The target populations which were broadly classified as Government, Public, and Private are the ones which would give the kind of data needed to meet the survey objectives. Samples were drawn from the potential target population using stratified random sampling. As secondary data sources on water technicians is meager and at times unrealistic, reliance on collection of primary data have had hardly any choice. Direct Interviews were planned to conduct on 241 direct survey respondents while self-administered survey to the extent of 760 was selected. More on this was also provided in sub-section 3.1 above.

Stratified Random Sampling was employed to select respondents from two sectors: government, and private. As for the Government organizations Regional Water Bureaus were all interviewed. Samples were drawn from Zones, Woredas and Town Water Supply Service. In the case of public enterprises, all the target population is considered in and embraced by the survey. To select the determined number of private companies for the study the consultant has used the recent updated lists that were available with the Ministry of Water, Irrigation and Energy. For detail, see the table below.

Table 6. Sample, Population and Collection Rates

	Government Organizations								Private companies								Public Enterprises	
	Delivered				Collected				Delivered				Collected				Delivered	Collected
	WB	Z	W	T	WB	Z	W	T	Con	Cons	Drill	San	Con	Cons	Drill	San.		
Oromiya	1	8	65	65	1	8	60	59	20	2	0	0	6	1	0	0	3	3
Amhara	1	9	36	44	1	9	24	27	20	0	0	0	11	0	0	0	3	3
Tigray	1	0	17	19	1	0	12	13	14	1	6	0	8	1	3	0	2	2
SNNP	1	8	41	35	1	8	31	33	18	0	2	0	2	0	0	0	2	2
AFAR	1	0	5	8	1	0	5	8	2	0	2	0	0	0	0	0	2	1
Somali	1	0	3	3	1	0	1	2	0	0	0	0	0	0	0	0	2	1
Bgumuz	1	0	2	2	1	0	2	2	0	0	0	0	0	0	0	0	1	1
A.A./Federal	0	0	0	1	0	0	0	0	160	20	21	2	48	8	8	2	2	2
Total	**7**	**25**	**169**	**177**	**7**	**25**	**136**	**144**	**234**	**23**	**31**	**2**	**75**	**10**	**11**	**2**	**17**	**15**
Delivery & Collection	**378**				**311**				**290**				**98**				**17**	**15**
Sample	**451(37% of pop.)**				**Collection rate – 69% of sample**				**531 (49% of Pop.)**				**Collection rate - 19% of sample**				**19 (100%)**	**Coll. rate – 79% of Sample**
Target Population	**1,221**								**1,026**								**19**	

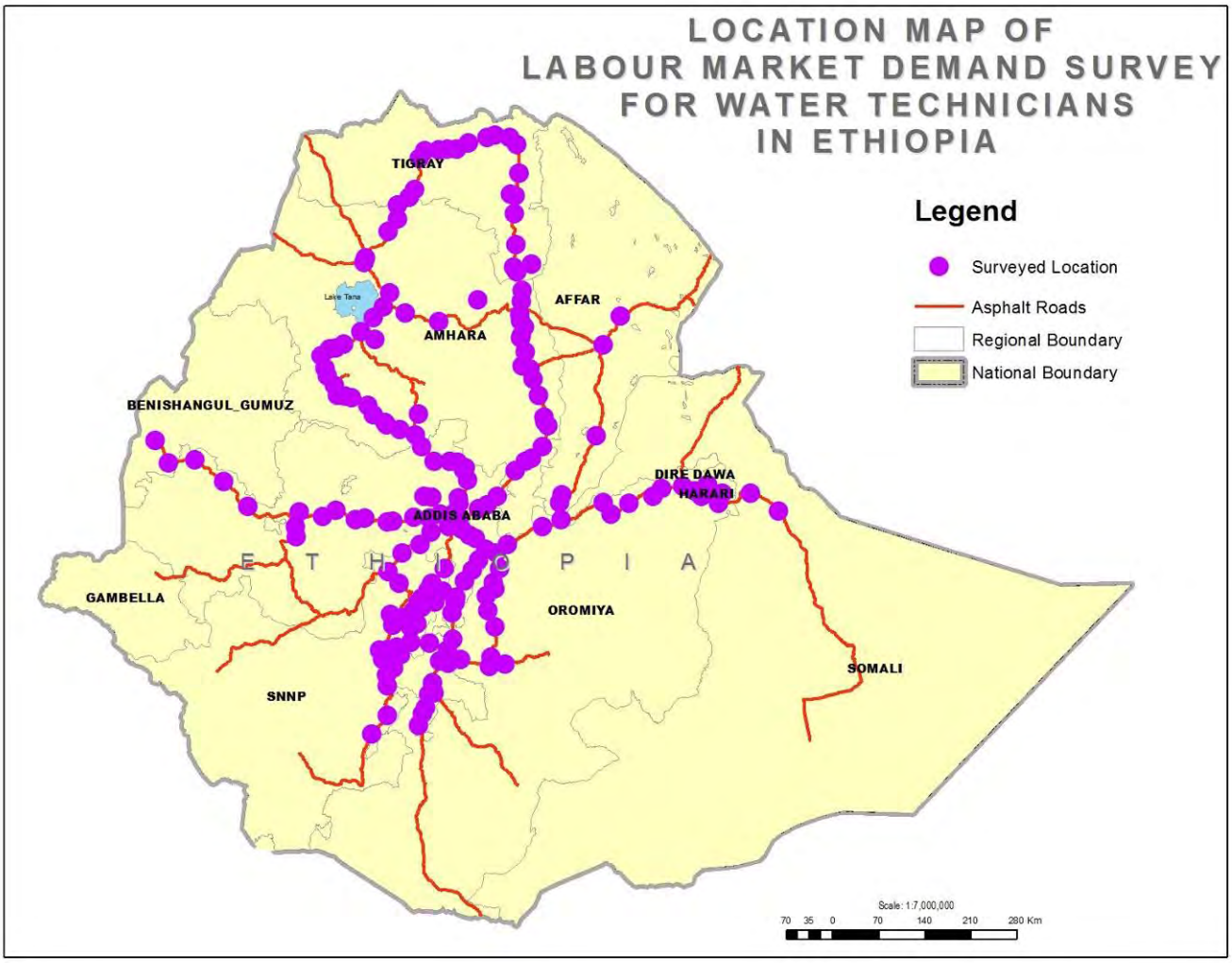
Source: Labor Market Demand Survey

There were limitations to keep perfect 'randomness'. Given the limited time frame it was difficulty to travel far from the main road, so that the remote/ very rural organizations were not able to be included. Thus was a possible sampling bias in the survey.

Data analysis should be directed at meeting survey objectives. The analysis need to be organized in such a way that it answers the survey enquiries elucidated under sub-section 1.2. It must be noted that analysis is done once the data are exported from Access Database into Excel Spreadsheet and different charts, figures and tables etc., are prepared. The database is created to avoid errors in data entry and for future use of EWTI's training management or customer relationship management.

4 Survey Areas

The labor market demand survey has covered 7 regional states, a City Administration (Addis Ababa) and Federal Government. The profile of surveyed regions and the city administration is presented below.



Source: Processed by Ag Consult Survey Team

Figure 2. Map Showing Location of Survey Points

Figure 2 shows that the survey coverage throughout the country addressing the target respondents at their location.

4.1 Addis Ababa City Administration

Addis Ababa City Administration is the seat of the Federal Democratic Government of Ethiopia, the African Union Office, International Organizations and a number of diplomats.

Addis Ababa is located at the geographical center of the country and lies between 8^o 55'and 9^o 05' north latitude and 38^o 40' and 38^o 50' minutes east longitude.

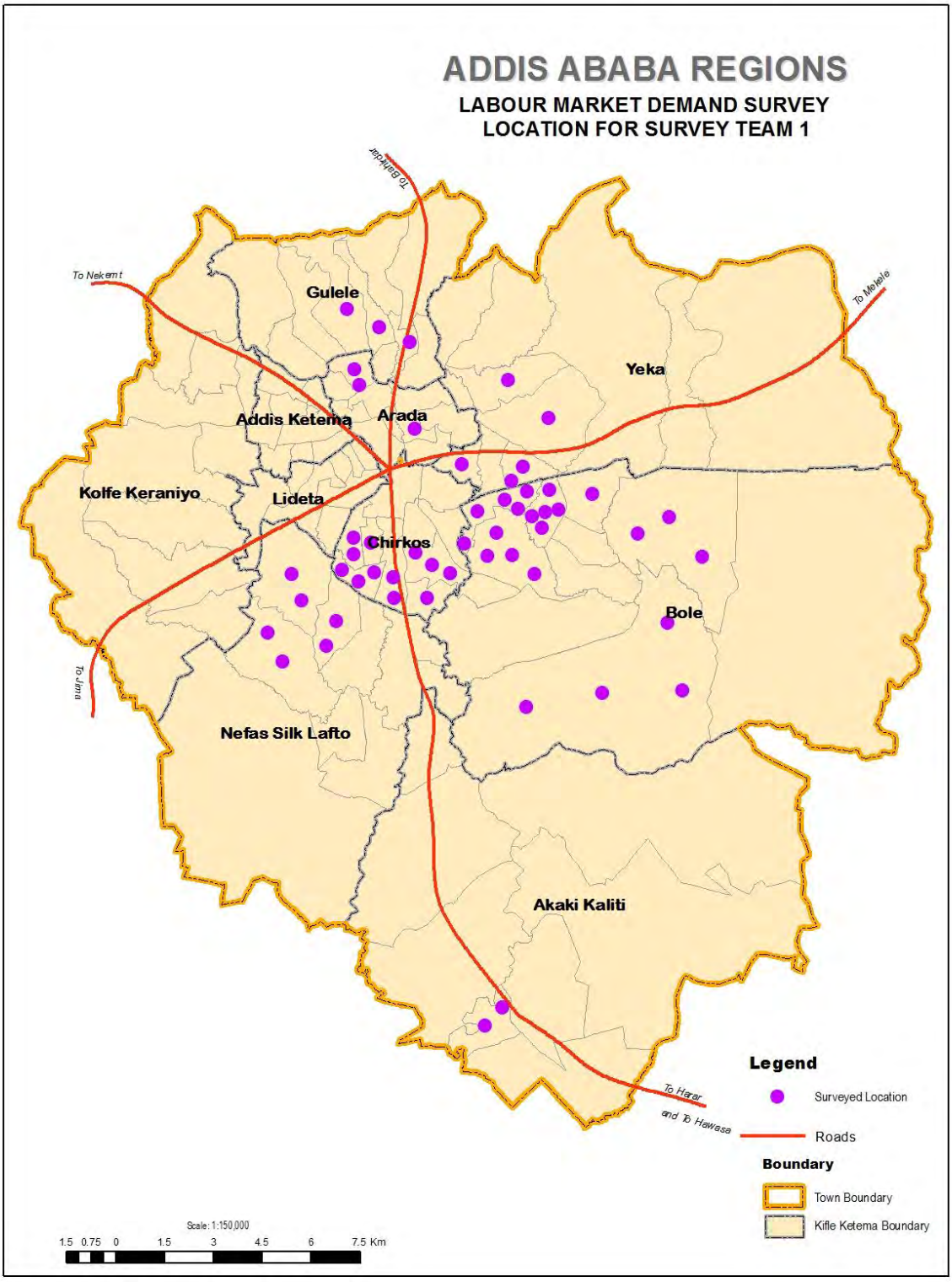
The total area of Addis Ababa City Administration is about 540 km² and the city Administration is bordered by Oromia Regional State in all direction.

Addis Ababa City Administration is administratively structured by 10 Sub Cities that have 100 Woredas include surrounding rural Kebeles.

According to the Central Statistic Authority (CSA) projection report the city Administration has a total population of 3,273,000 for the year 2015. Out of this total population, males and female were reported to constitute 47.4% and 52.6% respectively.

The city's population is predominantly engaged in various business activities mainly trading, small-scale industries and other service provision entities. Addis Ababa water supply and Sewerage Authority (AAWSA) is responsible for the supply of water and sanitation service to the people of the city. The current water coverage has reached 90%. The authority produces about 599,000 m^3 water daily from different sources including surface water, springs including a number of groundwater wells.

This following figure shows the survey coverage within the boundary of Addis Ababa indicating office location of the respondents.



Source: Processed by Ag Consult Survey Team

Figure 3. Map Showing Location of Survey Points in Addis Ababa

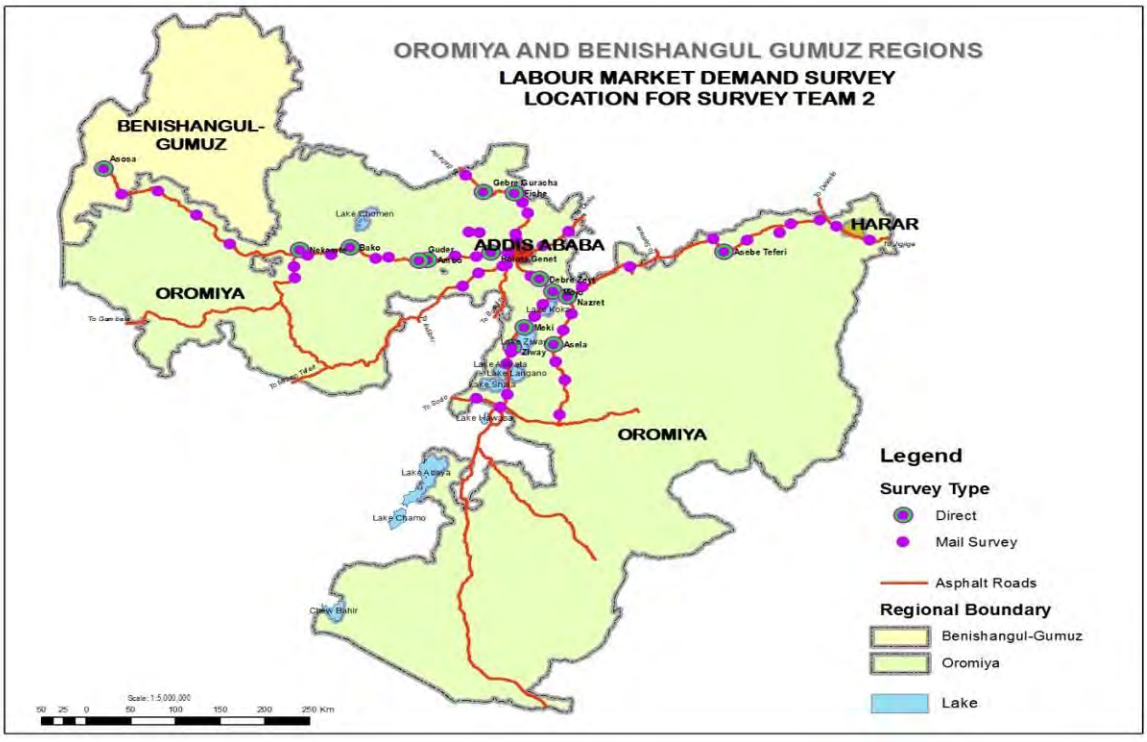
4.2 Oromiya Region

The Oromiya Regional State is located at the Central part of Ethiopia. The total area of the region is about 359,619.8km² and comparably the largest area in the country. It is bordered to the North by Amhara Region, to the South by SNNP Region and Keneya, to the East by Afar and Somali Region and to the West by Benishangul Gumuz and Gambela Regional states. The seat of the regional state is located in Addis Ababa.

Oromiya region is administratively structured by 20 zones including 3 special zones and having 279 Woredas.

According to the CSA projection (2015) the region has a total population of 33,692,000. Out of this the male and female populations is reported to be 50.2% and 49.8% respectively. At the same time urban population constitutes 14% while rural population 86%.

The water resource potential is considered high. However, the provision of potable water to the people is low. So, large number of them uses sources provided by nature in the form of spring, hand-dug wells, lakes, rivers and rain-fed seasonal pools.



Source: Processed by Ag Consult Survey Team

Figure 4. Map Showing Location of Survey Points in Oromia and Benshangul Gumuz Regional States

The figure above shows the surveyed sites representing towns, zones, woredas and regional bureaus within Oromia and Benishangule Gumuz Regional state.

4.3 Amhara Region

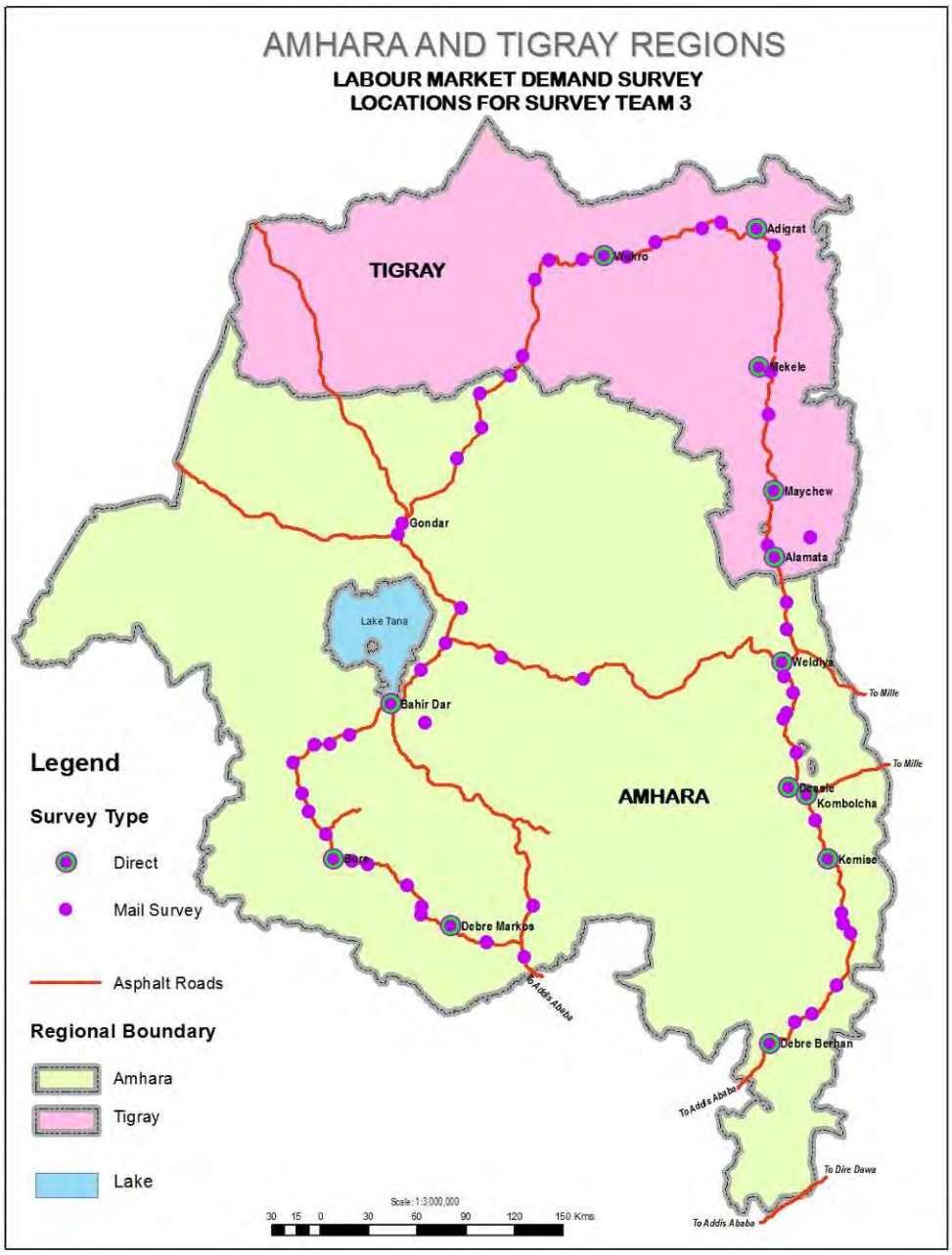
The Amhara Regional Sate is located at the northwest and partly central part of Ethiopia. The total area of region is about 161,828.4 km² which is about 11% of the total area of Ethiopia.

Amhara region is bordered to the north with Tigray region, to the east and south east with Oromiya Region, to the east with Afar, to the west and north west with Benishangul Gumuz and to the north and north west with North Sudan.

Administratively, the Amhara Regional State consists of 11 zones and 141Woredas including one special Woreda.

The capital city of Amhara regional state is Bahir Dar which is located at a distance of 565 km from Addis Ababa to North direction.

The CSA report indicates that the region has got a total population of 20,401,000. Male and female population constitute 50.1% and 49.9% respectively.



Source: Processed by Ag Consult Survey Team

Figure 5. Map Showing Location of Survey Points in Tigray and Amhara Regional States

4.4 Tigray Region

The Tigray Regional State is located at the northern part of Ethiopia. The total area of Tigray Region is about 54,569.25 km². It is bordered to the North by Eritrea, to the South by Amhara Region, to the East by Afar and to the West by Sudan.

The region's climatic zones are lowland/kola/, temperate/weinadega/ & highland/dega/. The altitude of the regional capital is 2,100 meter above sea level.

Tigray Region is administratively structured into 6 zones (one especial zone, Mekelle), having 44 woredas among this 9 woredas are urban whereas the rest 39 are rural woredas.

The Regional state's capital is Mekele which is located at a distance of 760 Km north of Addis Ababa.

According to the CSA report of the year 2015, the region has a total population of 5,056,000. Out of this total 49% is male while 51% female. At the same time urban and rural population constitute 49.3% and 50.7% respectively.

According to Regional Water Bureau report the regional water supply coverage has reached 80% while access to water supply is reported 89%.

4.5 Southern Nations Nationalities & Peoples Region

The South Nation Nationalities and Peoples Regional State (SNNPR) is located at the southern and southwest part of Ethiopia The total area of SNNP Region is about 117,506.4 km². It is bordered to the North and East and West with Oromia Region and to the South by Keneya. s

SNNP Regional State has got 18 zones including 7 special zones and 146 Woredas of which 6 of them belong to urban while the rest 137 rural.

The regional capital is Hawasa which is located south of Addis Ababa at a distance of 275 km.

The region has an estimated total population of 18,276,000 with male population of 9,060,000 (49.6%) and female population of 9,216,000 (58.4%). The region is characterized by dense population ranging from 227 people per square km in the high lands to 26 individuals per square km in the low land areas.

In the region, 85% of the population depends on agriculture and is at subsistence level.

The Region's Water Bureau report indicated a water supply coverage of 73% while access to water supply is reported 93%.

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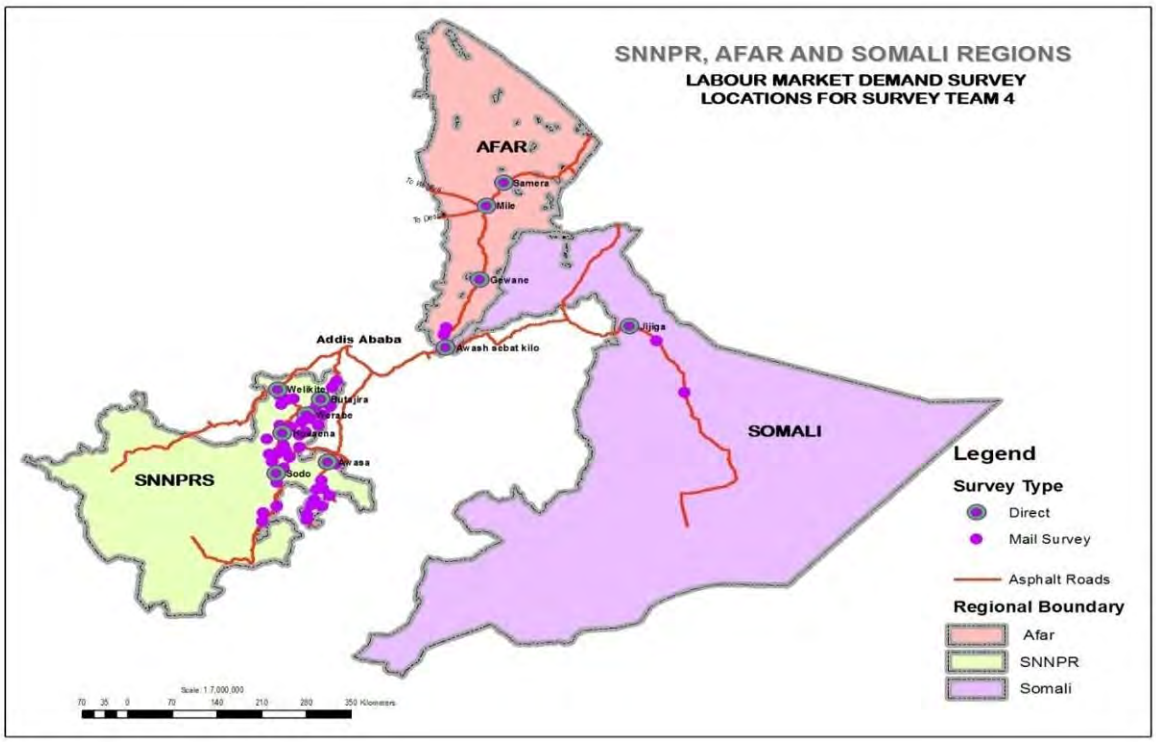


Source: Processed by Ag Consult Survey Team

Figure 6. Map Showing Location of Survey Points in SNNP and Afar and Somali Regional States

The above figure shows the coverage of the survey that has been conducted in the SNNP Regional State, Afar Regional State and Somali Regional state.

4.6 Somali Region

Somali Region is one of Ethiopia's largest regions. It is located at the eastern part of Ethiopia. It borders with Djibouti to the north, Somalia to the east and north-east, and Kenya to the south. To the west it borders with Oromiya Region, to the north-west with Afar Region.

Somali Region is administratively structured by 7 Zones and 46 Woredas.

The Regional capital is Jigjiga which is located at a distance of 600 Km east of Addis Ababa.

Based on the CSA population projection for the year 2015, the Somali Region has a total population of 5,453,000. The majority of the population is agro-pastoral and is dependent on livestock (cattle, camel goats and sheep rearing) as well as sedentary farming along river basins

as means of livelihood. The Regional Water Bureau has reported that the regional water supply coverage has reached 39% while 80% of the population has access to safe water.

4.7 Afar Region

Afar Regional State is located at the north part of Ethiopia. The total area of Afar Region is about 270,000 km². The region shares common international boundaries with the State of Eritrea to the north-east and Djibouti to the east, as well as regional boundaries with the Regional States of Tigray to the north-west, Amhara to the south-west, Oromia to the south and Somali to the south-east.

Administratively, the Afar National Regional State consists of 5 administrative zones and 30 Woredas. The Regional State's capital is Semera which located at a distance of 760 Km from Addis Ababa to East North direction. .

The CSA report shows that the region has a total population of 1,723,000. Out of this the male and female populations are reported to be 54.9% and 45.1% respectively. At the same time, urban population is 17.8% while rural is 82.1%.

Over 90 percent of the region's population is classified as pastoralists who dependent on animal husbandry for their livelihood. Apart from a small percentage of the population engaged in commerce or the civil service in urban areas, the major portion of the population is classified as agro-pastoral population who depends on livestock as well as sedentary agricultural production.

The Region has enormous water resource but very little has been developed for agriculture, industry, water supply, energy and other purposes. With regard to water supply coverage it is reported to be 65%. For the case of urban population it is reported that 89% of the population has access to safe water supply

4.8 Benishgul Gumuz

The Benishangul Gumuz Regional sate is located at the western part of Ethiopia. The total area of Benishangul Gumuz is about 50,380 km². The region has international boundary with the Sudan to the west and is bordered by the Amhara region to the north and northeast, Oromiya to the southeast and Gambella to the south.

Agro-ecologically, it is divided into Kolla about 75% (lowlands below 1500 masl), Woina Dega about 24% (midland between 1,500-2,500 masl) and Dega about 1% (highland above 2,500 masl).

Benishangul Gumuz Region is administratively structured into 3 zones having 21 Woredas. The Regional state capital is Asossa which is located at a distance of 687 Km West of Addis Ababa.

According to the CSA report the region has a total population of 1,005,000 with male population represents 50.6% while female 49.4%. Agriculture is the main means of subsistence in the Region, in which nearly all the rural the population depends for subsistence while urban population is engaged in trading and service provision activities at large.

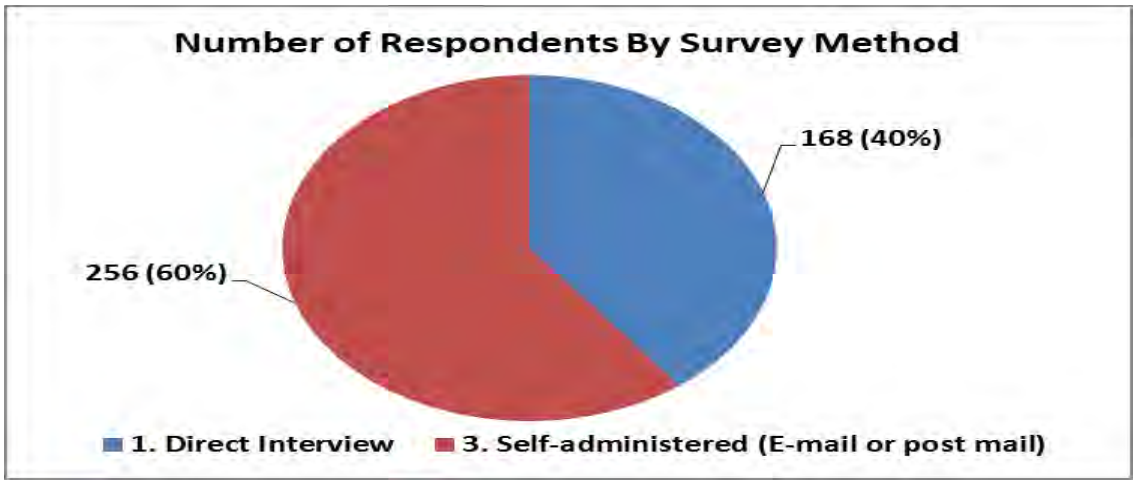
The water supply coverage in the rural area is reported to be 32.18% according to the report given by the regional water bureau. In urban areas it is reported that 92% of the population has access to safe water supply.

5 Data Presentation and Analysis

5.1 Profile of Respondents

5.1.1 Survey methods

There were 424 respondents where 256 (60%) were directly interviewed while the rest 168 (40%) were SA respondents who have filled out the questionnaires themselves with minimum support. A semi-structured questionnaire was used for data collection.



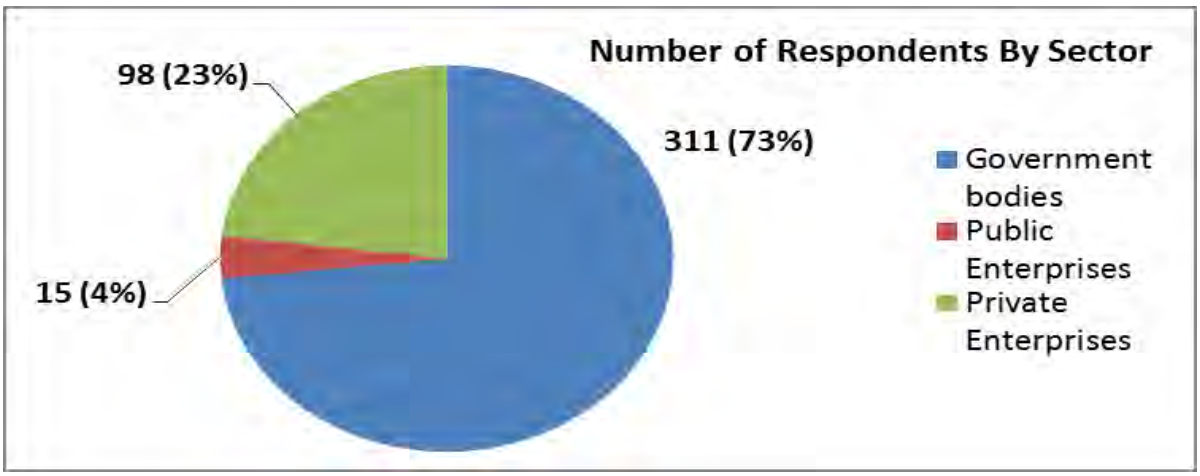
Source: Labor Market demand Survey

Figure 7 Number of Respondents by survey method

The profiles of respondents are expressed by sector, region, type of organization, year of establishments, company nationalities as provided one after the other in the figures below.

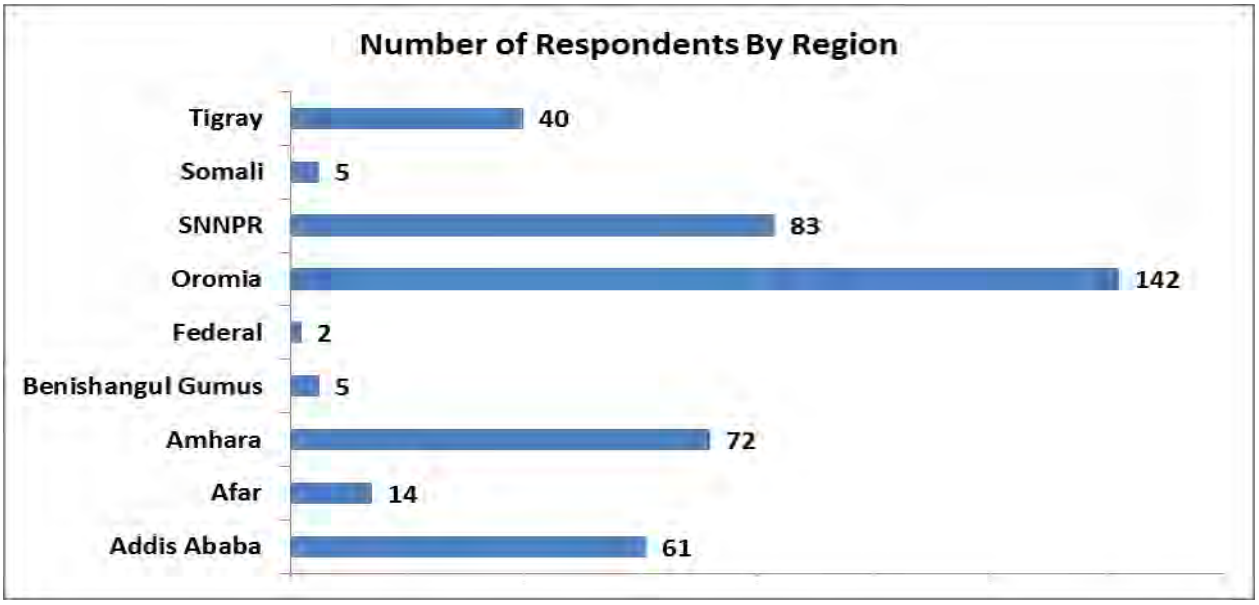
5.1.2 Respondents by Sector, Region & Type of Organizations

The following figures show the number of respondents by three sectors, by region and type of organization. It is obvious that the government sector has turned to be over-represented due to the lower response rate in the private sector (see Table 6 above).



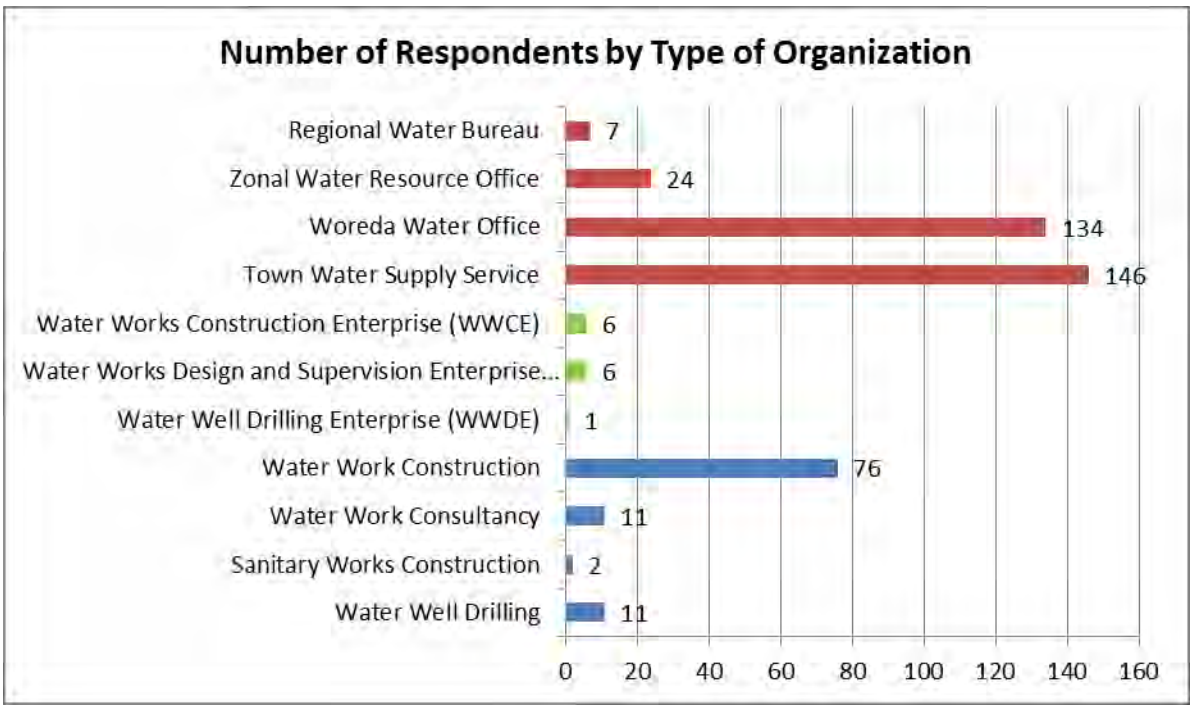
Source: Labor Market demand Survey

Figure 8: Number of Survey Respondents expressed by Sector



Source: Labor Market demand Survey

Figure 9 Number of Respondents by Region

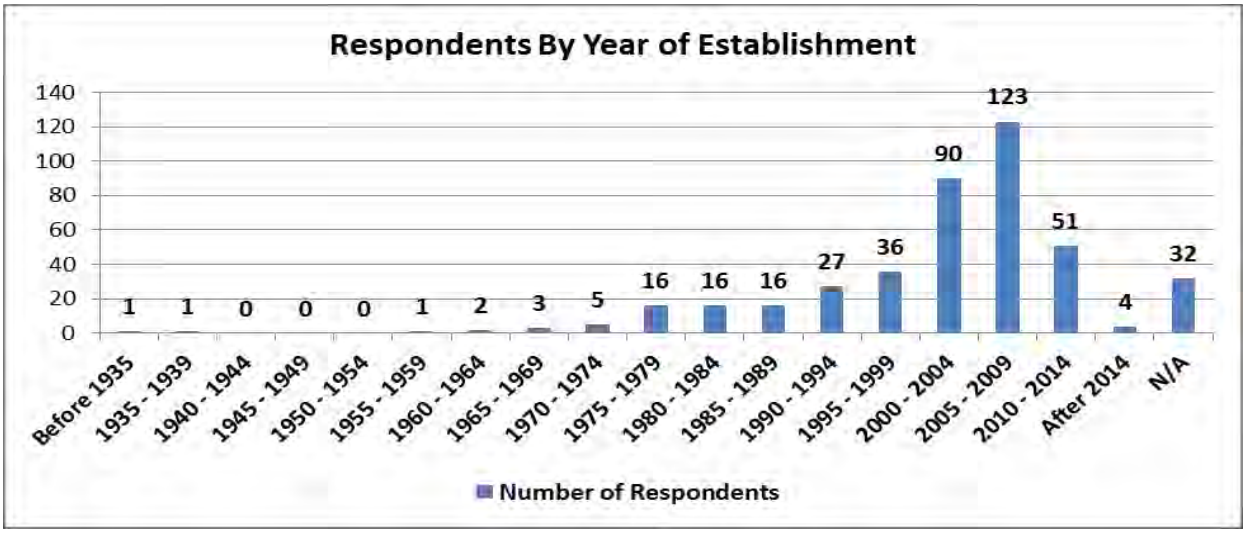


Source: Labor Market demand Survey

Figure 10 Number of Respondents by Type of Organization

5.1.3 Respondents by Year of Establishment

When one examines the year of establishment of surveyed organizations, it was found out that a large number of them were established between the years 2000 and 2014. It is highly probable that this can applies more to the private sector than the rest of the sectors. The private sector companies have been on the increase accompanying the favorable economic environment in the country which has been manifested since the recent past. Hence, one would suggest most of the organizations in the private sector are believed to be young. When it comes to government sector organization, newly established organizations might have come owing to a host of factors such as population increase, rise in income accompanying growth since recent times, government support on water supply and sanitation, involvement of NGOs, and other factors. As a result more and more people would tend to having better access to water supply at close proximity. This can be validated by looking at the section on business growth projections in sub-section 5.7.1 below. This situation implies that with positive growth prospect and as most companies are at a growing age, the trend for labor demand and training would be increasing.



Source: Labor Market demand Survey

Figure 11: Number of Targeted Organizations by Years of Establishments

5.1.4 Respondents by Company Nationalities

There were 290 private sector companies which have received the survey questionnaires. Out of this number it was only 98 of them which have filled out the questionnaires and returned. Because of this and possibly other reasons, it was not possible to get data on company nationalities that would have allowed one to discuss on company nationalities. Hence the question raised in the survey questionnaire to distinguish respondents by nationality has meet with less or almost "No" response leaving all respondents who have reacted to the enquiry to be local organizations.

5.2 Occupational Categories and Levels of Employees

5.2.1 Employees by Type of Organization

Currently there are a total of 24,750 employees working with the surveyed organizations. Of this total number, "technical employees" account for 44%. The table below provides the breakdown of employees by type of organizations they are employed.

Table 7. Number of Employees by Type of Organization

Type of organization	Managers./ Supervisors	Technical Employees	Admin. /clerical Employees	Support Employees	Total No of Employees in Surveyed Org	Tech. Employees to Total in %
RWB	110	532	152	694	1,488	36%
Zonal W. Office	84	439	40	243	806	54%
Woreda W. Office	375	1,587	60	519	2,541	62%
TWSSS	446	2,530	2,056	3,892	8,924	28%
WWCE	143	2,765	597	2,091	5,596	49%
WWDSE	105	1,607	215	452	2,379	68%
WWDE	28	249	39	103	419	59%
WWCC	132	786	246	595	1,759	45%
WW DC	55	267	116	198	636	42%
WW Consulting Company	18	104	27	38	187	56%
Sanitary Works Company	2	8	3	2	15	53%
TOTAL	**1,498**	**10,874**	**3,551**	**8,827**	**24,750**	**44%**

Source: Source: Labor Market demand Survey

Considering the share of technical employees (10,874) over the total number of employees of the surveyed organizations (24,750), technical employees outweigh the rest i.e. 44%. By type of organization, WWCE employed the largest number of technical employees (25% of the technical employees). This is followed by TWSS (23%), WWDSE (15%) and Woreda Water Office (15%) as shown in the table below.

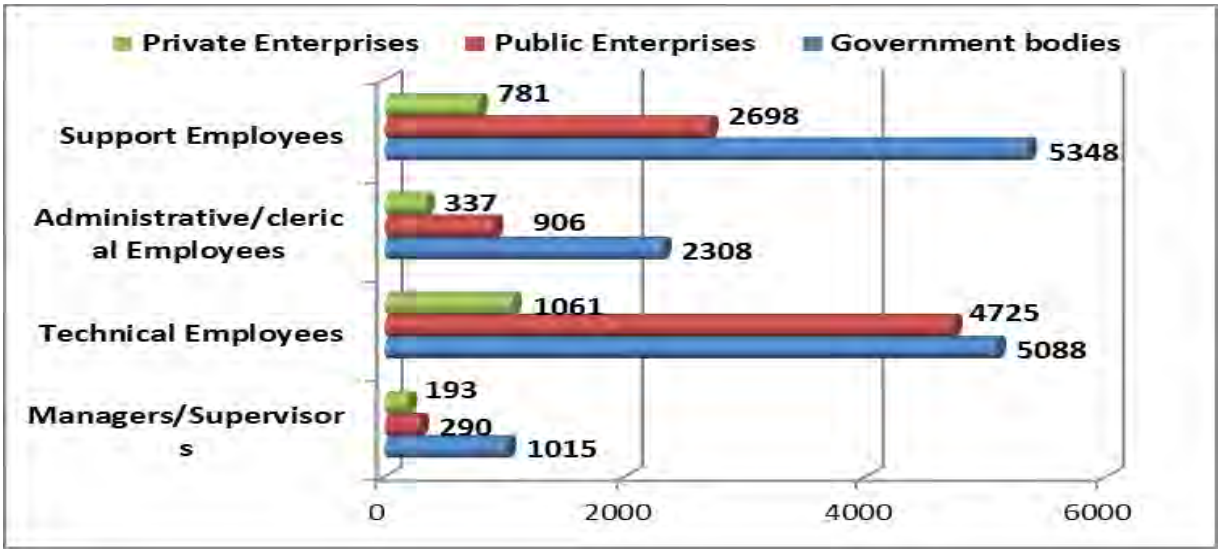
Table 8. Number of Technical Employees by Type of Organization (among Surveyed)

Type of organization	Technical Employees	In %
RWB	532	4.89%
Zonal W. Office	439	4.04%
Woreda W. Office	1,587	14.59%
TWSSS	2,530	23.27%
WWCE	2,765	25.43%
WWDSE	1,607	14.78%
WWDE	249	2.29%
WWCC	786	7.23%
WWDC	267	2.46%
WW Consulting Company	104	0.96%
Sanitary Works Company	8	0.07%
TOTAL	**10,874**	**100.0%**

Source: Source: Labor Market demand Survey

5.2.2 Categories of Employees by Sector

The figure given below also shows that in all the sectors, government, private as well as public, technical employees dominated over the rest of employee categories.



Source: Labor Market demand Survey

Figure 12 Number of Employees By Sector

What was done in this section has been that the total number of employees at the level of the water sector in the target regions was computed for estimate of the whole labor market there. Accordingly the level of current employees within the water sector would be 45,211 when all the above categories were considered together as can be seen in the two tables below. Moreover, if one assumes that the share of technical employees in our survey, 44%, is applied, the numbers of technical employees among them would be 19,893 in the target regions.

Table 9. Estimate of Total Water Sector Employees by Type of Organization

Type of Organization	Average No. of Employees Found in the Survey	Total Number of Organization in the Target Regions	Estimate of Total Water Sector Employee
Regional Water Bureau	213	9	1,917
Zonal Water Office	22	45	990
Woreda Water Office	13	700	9,100
Town Water Supply & Sanitation Services	43	467	20,081
Water Works Construction Enterprise (WWCE)	700	8	5,600
Water Works Design & Supervision Enterprise (WWDSE)	297	8	2,376
Water Works Drilling Enterprise (WWDE)	140	3	420
Water Works Construction Company	4	920	3,680
Water Works Drilling Comp.	12	71	852
Water works Consulting Companies	6	30	180
Sanitary WC Company	3	5	15
TOTAL			**45,211**

5.2.3 Categories of Employees by Region

The table below consists of the different categories of employees disaggregated by region.

Table 10. Number of Employees by Region with Estimate of Total Number of Employees[12]

Number of Employees By Region						
Region	**Managers/ Supervisors**	**Technical Employees**	**Admin. /clerical Employees**	**Support Employees**	**Total No of Employees in surveyed Orgs'**	**Estimate of Total Water Sector Employees**
Addis Ababa	200	1,552	489	2,158	4,399	8,036
Afar	29	220	75	343	667	1,218
Amhara	310	2,307	627	1388	4,632	8,461
B. Gumuz	7	81	11	170	269	491
Federal	109	1,300	137	1,192	2,738	5,002
Oromia	426	2,385	864	1,777	5,452	9,960
SNNPR	211	1,630	382	1,020	3,243	5,924
Somali	32	176	62	154	424	774
Tigray	174	1,223	904	625	2,926	5,345
TOTAL	**1,498**	**10,874**	**3,551**	**8,827**	**24,750**	**45,211**

Source: Labor Market demand Survey

The total number of employees among surveyed organizations is about 24,750, but the estimate of total employees in the sector would be about 45,211. Oromia, Amhara and SNNP would offer the largest number of technical employees as shown above.

[12] The number of Technical employees shown in table 10 is higher than the number of technicians by profile as shown below in table 11. This is the result of the different questions presented to respondents where one can observe differences in the number of responses.

5.3 Technical Employees

The following table provides details of technical employees disaggregated by sector and type of organization.

Table 11. Number of Technical Employees by Type of Organization and Sector

Type of organization	No of Engineers		No of Technicians		Assist. Technicians	
I. Government Sector						
Regional Water Bureau		361		152		9
Zonal Water Resource Office		338		82		3
Town Water Supply Service		346		1,930		229
Woreda Water Office		515		1,033		53
Sector Total	**31%**	**1,560**	**63%**	**3,197**	**6%**	**294**
II. Private Sector						
Sanitary Works Construction		4		5		0
Water Well Drilling		94		140		65
Water Works Construction		316		398		135
Water Works Consultancy		96		14		1
Sector Total	**40%**	**510**	**44%**	**557**	**16%**	**201**
III. Public Sector						
WWDSE		965		112		0
WWCE		574		1,979		212
WWDE		42		157		50
Sector Total	**39%**	**1,581**	**55%**	**2,248**	**6%**	**262**
SUM TOTAL	**35%**	**3,651**	**57%**	**6,002**	**7%**	**757**

Source: Labor Market demand Survey

In all sectors and across all types of organizations, technicians dominate (6,002) over rest of technical employees. The government sector happened to employ more technicians (about 63%) in our surveyed respondents while the private sector employed more engineers (about 40%) as can be seen in the table above.

5.3.1 Profile of Technicians and Assistant Technicians

5.3.1.1 Profile by Job Type and Level

There were only 5,645 technicians among valid responses to have been employed and engaged in different types of jobs as one can see in the table below.

Table 12. Profile of Technicians and Assistant Technicians by Type of Job

Profile of Technicians & Assistant Technicians By Job Type	
Type of Jobs	**Number of Technicians and Assistant Technicians**
Hydrology Technician	73
Mechanic/Drilling Machinery Maintenance Technician	644
Surveyor	438
Draft person/CAD operator	43
Driller	150
Electrician	470
Water Laboratory Technician	131
Soil Laboratory Technician	31
Welder	104
Plumber	1,123
Bar Bender	51
Painter	14
Carpenter	54
Mason	78
Heavy Equipment Operator	412
Other	1,778
N/A Job Type	51
TOTAL	**5,645**

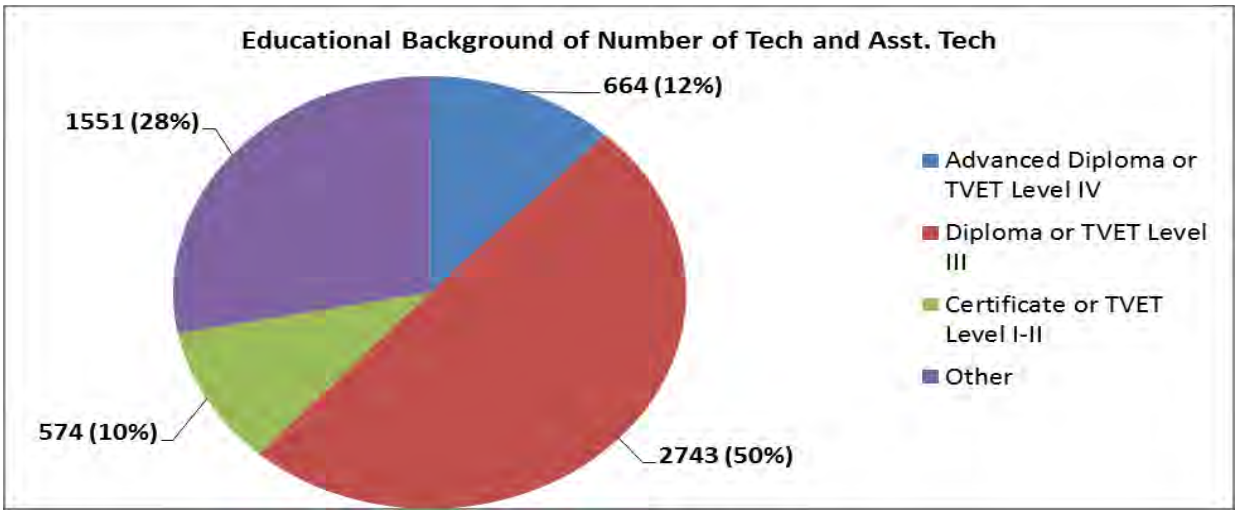
Source: Labor Market Demand Survey

From the table above it can be seen that plumbers to have been dominating the technician domain. Mechanic/ drilling machinery maintenance technician, electricians, surveyors and heavy equipment operator were among the top most wanted technicians. What is interesting here has been the one which is listed under "Others". The job type indicated by "Other" consists of 'Pump Operators", "Community Promoters", 'Irrigation Technicians", Water Meter Readers", etc.

5.3.1.2 Educational Background

When one looks at the educational background of technicians almost 50% of them have attained Diploma or completed TVET Level III while quite a few have reached Level IV (12%). In "Other" category we get employees with lower education level than certificates. They may have secondary education or below but might not have met the requirement for entrance into TVET or other higher educational institutions. Therefore, one can infer that about one third of the technicians and assistant technicians may have inadequate education and training background to

carry out the task. It could be one of the causes of "skill and knowledge gap" of the technicians in water sector.

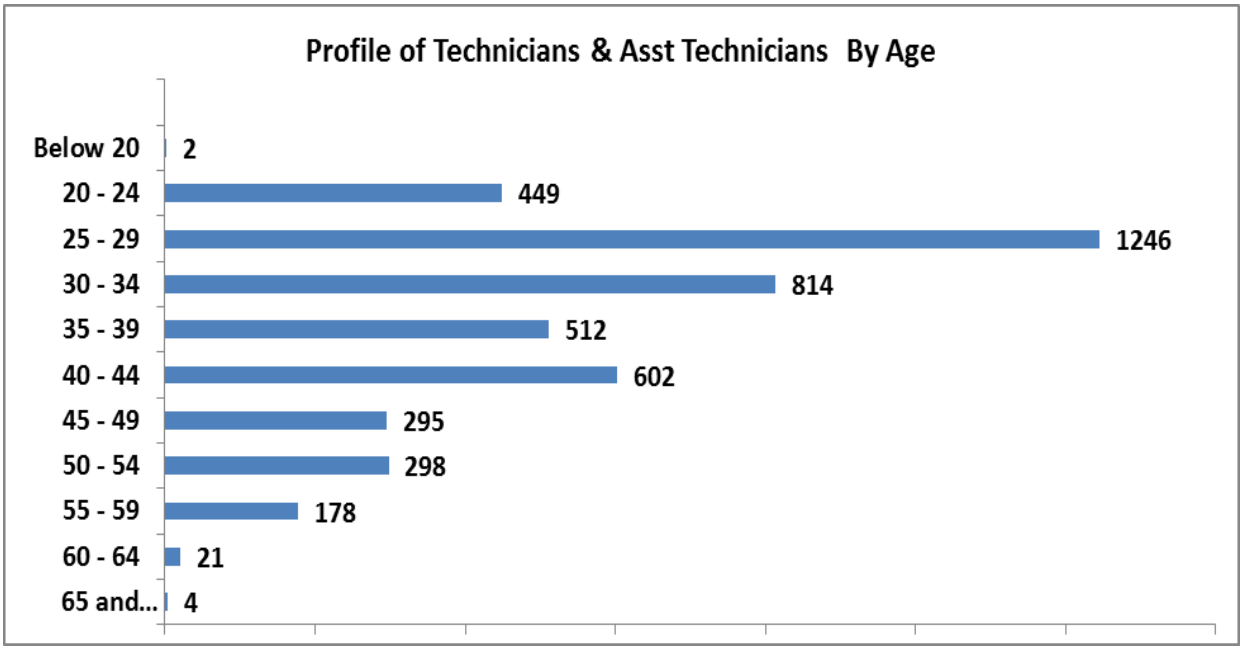


Source: Labor Market Demand Survey

Figure 13: Technicians and Assistant Technicians by Educational Background

5.3.1.3 Profile of Technicians by Age-Group

When one looks at the Profile of Technicians by Age Group, their age group ranges from below 20 to above 65 age groups as shown in the following figure.



Source: Labor Market Demand Survey

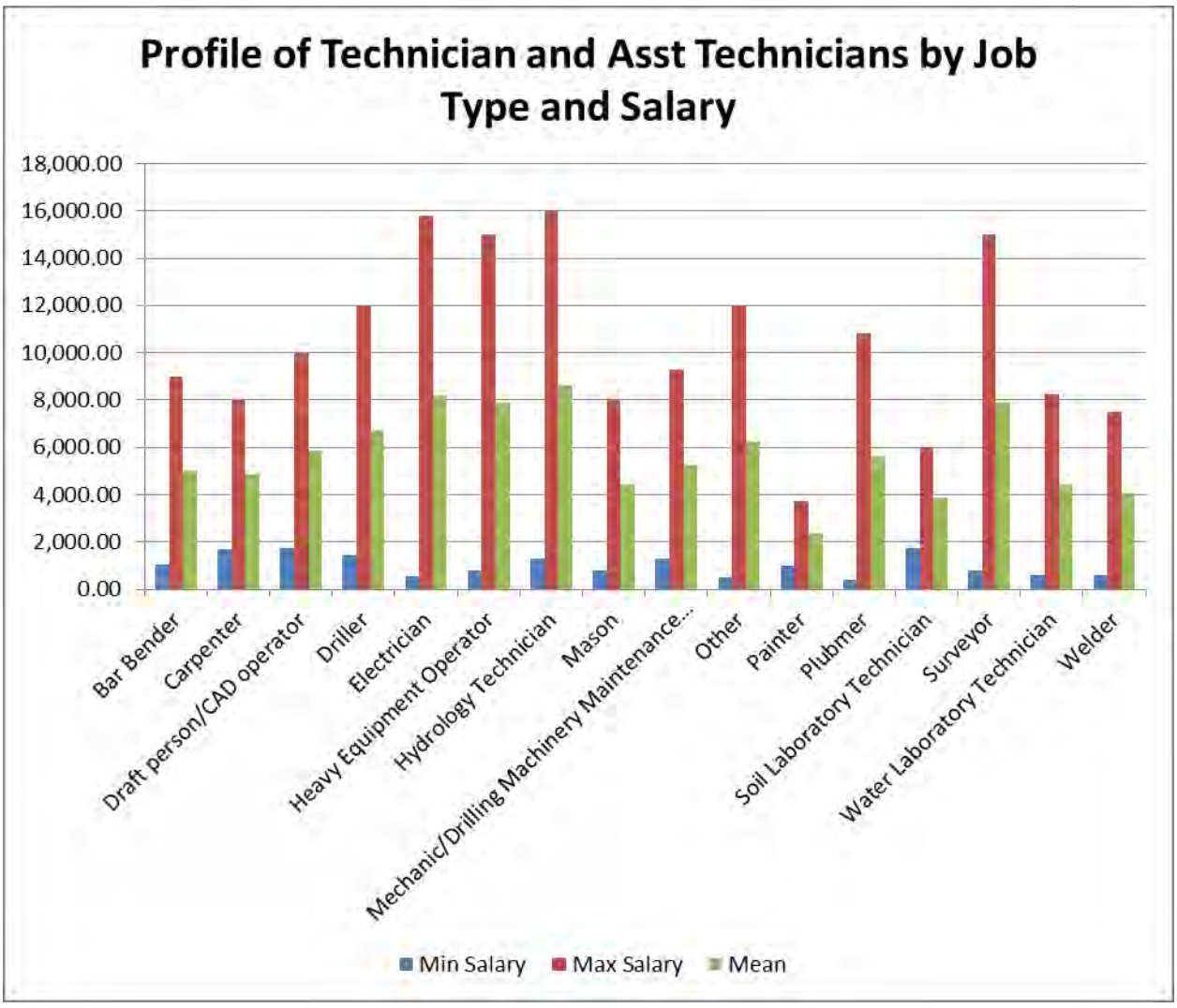
Figure 14: Number of Technicians and Assistant Technicians by Age Group

The age group between 25-29 represented some 28% of total respondents that form the biggest age group. In addition, when one adds up number of technicians below the age group of 40-44, which is the average age group, one would get 3,023 (68%) of total number of technicians in all the age groups. This shows that the majority of technicians are below the average age group. It implies that when "Others" under both "Education Profile" and "Profile by Job Type" and "Salary Profile" are considered together with the findings from "Profile by Age Group", one may assume the following:

- The job prospects for technicians and future training are good which results from growth in business operations following a positive growth in investments and the relatively young private sector companies;
- The better future business prospect may attract those technicians with lower education qualifications or those without proper skill training to come more and more towards education and training institutions;

5.3.1.4 Salary Profile

The figure below shows the existence of very little variation with minimum salary across the different job types. As one can see the minimum salary is almost flat across the different jobs. However, variations are detected when it comes to maximum salary. One would state that such variations could be influenced by a host of factors such as education level, experience, job type and level, and similar others. The level of maximum salary for such as drillers, electricians, heavy equipment operators, hydrology technicians, surveyors is relatively high compared to the rest. In addition, the private sector pay level is estimated to be relatively higher which can add to the variations. However, educational background could be among the significant factors that underline the variations and the actual level of payment. If one takes and analyze the variations in government salary level, the significant factors are educational level and experience. There is also a measure of basing employment by educational achievement among government organizations. The same trend can apply to the private sector employment, although experience is equally important.

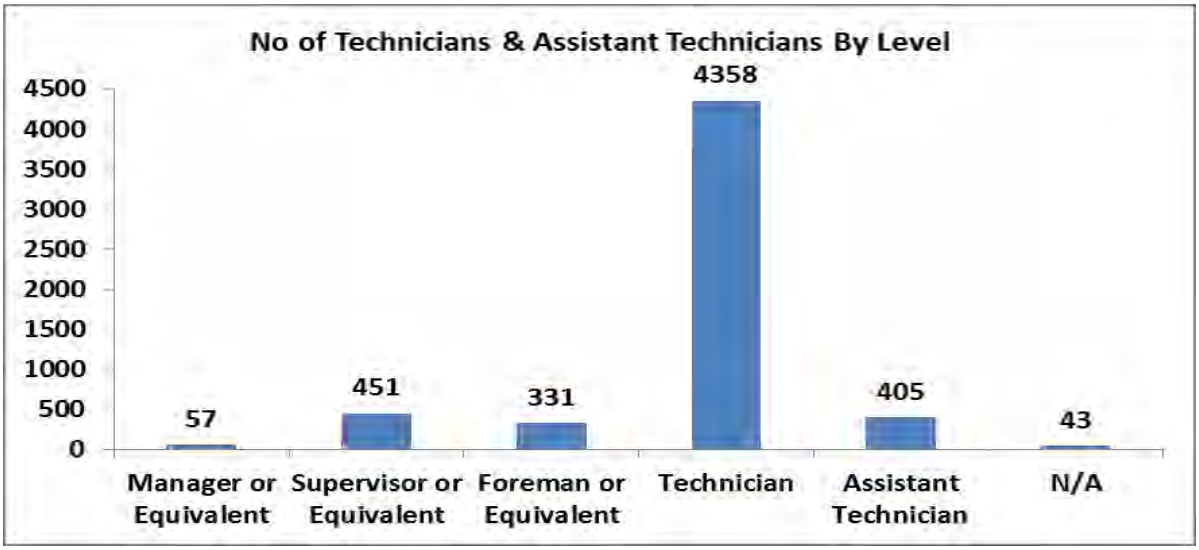


Source: Labor Market Demand Survey

Figure 15: Profile of Technician and Assistant Technicians by Job Type and Salary

5.3.1.5 Levels of Technicians and Assistant Technicians

When one looks at the job levels of technicians across the different job categories, one can find out that technicians account for the vast majority (77%) among the other categories of employees. The share of assistant technicians is just 7% of the total. The supervisor level consists of 8%, while foreman level for 6%, and manager level for 1%. Hence it suggests that the job market demand for technicians is comparatively bigger than other categories of employees. The profile of technicians by job level or job position is shown in the following figure.



Source: Labor Market demand Survey

Figure 16: Profile of Technicians & Assistant Technicians by Job Level

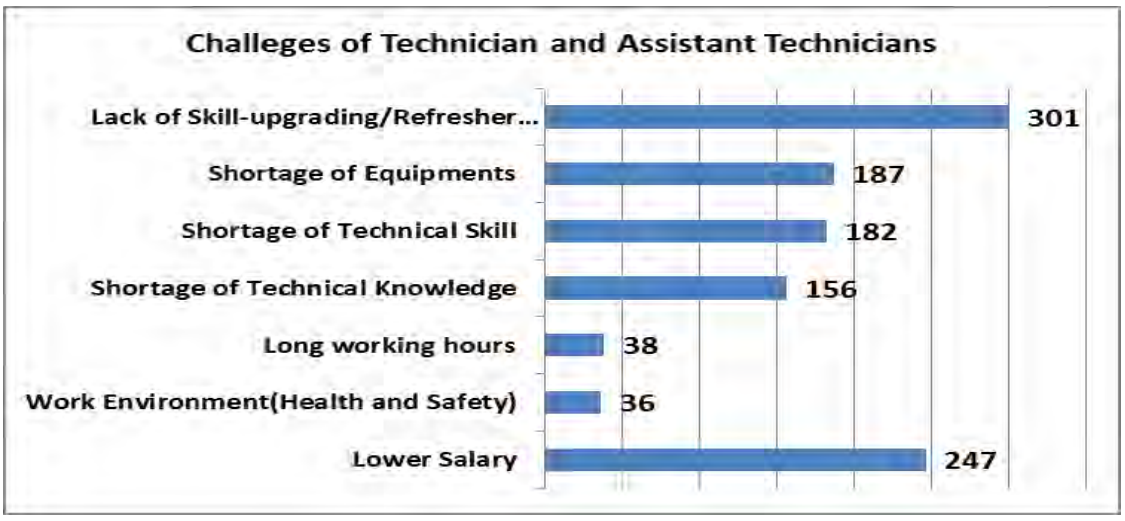
5.3.1.6 Gender Profile

When it comes to gender, male technicians are by far the largest (89%) in number compared to females which accounts for only 9%. There is no doubt that male population has had better chances to join the labor force. The same thing can be said about education as there have been cultural factors, among others, impeding females from going to schools. The statistics given above can imply that more needs to be done to change this glaring picture. One of these measures could be by providing access to education. The TVET policy and strategy encourages females to join TVET Colleges and more and more of them are coming to the technical field day by day.

5.4 Challenges Faced by Technicians & Employers

5.4.1 Challenges faced by Technicians and Assistant Technicians

The respondents of the different organizations surveyed were asked to state their perception of the challenges faced by technicians and assistant technicians working with them. The responses gathered are presented in the Figure below.



Source: Labor Market Demand Survey

Figure 17: Challenges Faced by Technician and Assistant Technicians

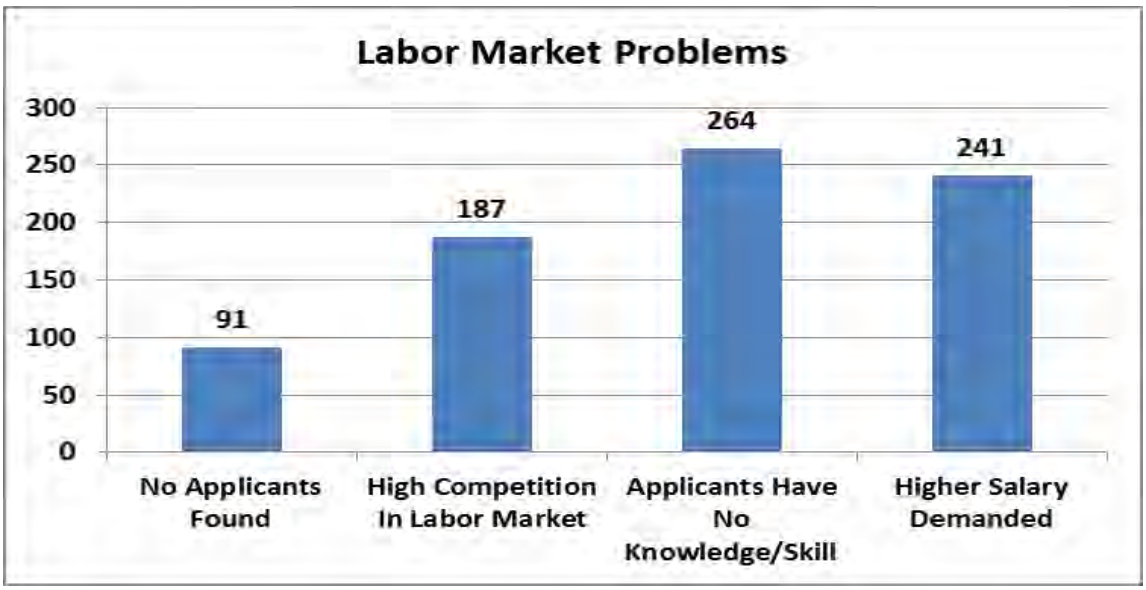
There were choices given to the respondents, who were the general managers or human resources managers, to pick three major challenges that they perceive technicians and assistant technicians were facing. These choices are depicted in the figure above together with the number of responses for each one of the choices.

From the figure given above, one can see that two major factors do contribute to cause dissatisfactions among technicians and assistant technicians. These are lack of skill-upgrading or refresher trainings followed by low level of salary. Of course shortages of equipment to work with at workplaces and inadequate technical skill do also play roles to causing challenges among technicians.

The result clearly indicates that the provision of skill training has been identified as a cause of concern that organizations must realize to improve employees motivation and preparedness for higher productivity. Even here one can say that any effort exerted to upgrading technicians' skill level is interconnected to overcome the other challenges such as existing salary level.

5.4.2 Recruitment Problems faced by Employers

In this regard respondents were asked as to what challenges they have been facing in recruiting technical employees in their respective organizations. Four possible problems were put forward for respondents to choose a "Yes" or "No" for each one. Accordingly "Applicants have no appropriate knowledge or skill" ranks high followed by "high salary demanded," and "high competition in labor market".



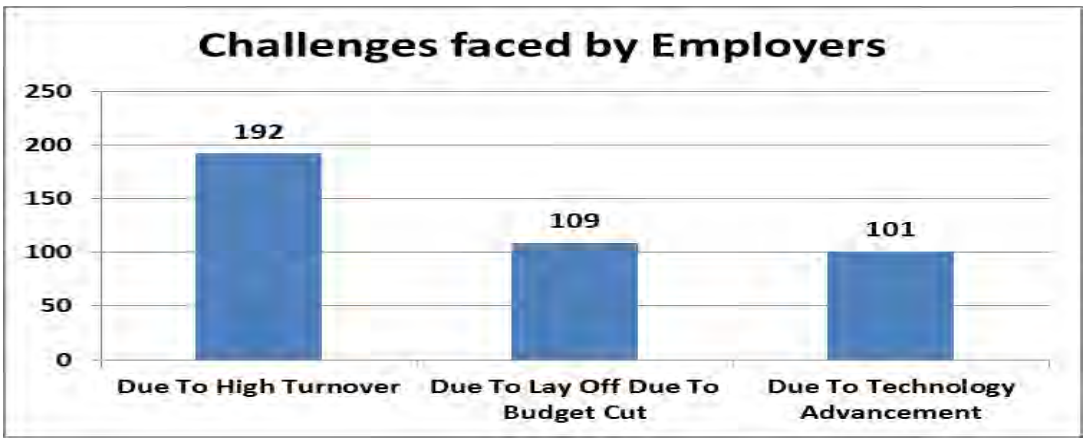
Source: Labor Market Demand Survey

Figure 18: Challenges in Recruiting Technical Employees in Responding Organizations

The very clear outcome from the above questions on labor market problems has been that job applicants have no skill and knowledge required by the job they apply to be recruited. The critical point of dissatisfaction both from employers as well as employees remained to be problem emanating from lack of skill and knowledge. This is clear signal to training providers to make sure not only to offer the needed trainings but equally important is the quality of skill trainings that is needed to be given. The implication is that good preparations are indispensable to offer quality training to prospective trainees.

5.4.3 Challenges in Technical Labor Force

Regarding the challenges faced by employers in the job market, respondents were asked whether they find such common problems as the existence of "high turnover" "lay off caused by budget cut or sales reduction" and "lay off caused by technology advancement" as possible challenges. These were a "Yes" or "No" question.



Source: Labor Market Demand Survey

Figure 19: Challenges Related to Technical Labor Force

The most important challenge where most respondents have shown is that there has been high turnover among employees working with them. The reasons for the rest i.e. lay off due to budget cut and technology advancement is clear and easy to understand. What appears to be difficult is to know what is the underlying factor being high turnover. A number of factors could explain the situation.

When we relate this part of high turnover to the question related to challenges faced by techicians, we can get menu of choices that could possibly explain the existence of high turnover. The answer to the question on challenges of technicians were already given to be lack of skill upgrading training and lower salary were among the top two choces. Hence the reason for the high turnover colud be explaned by these two factors. Hence skill training is a vital factor that the employers have to take care when they prefer to retain the labor with them.

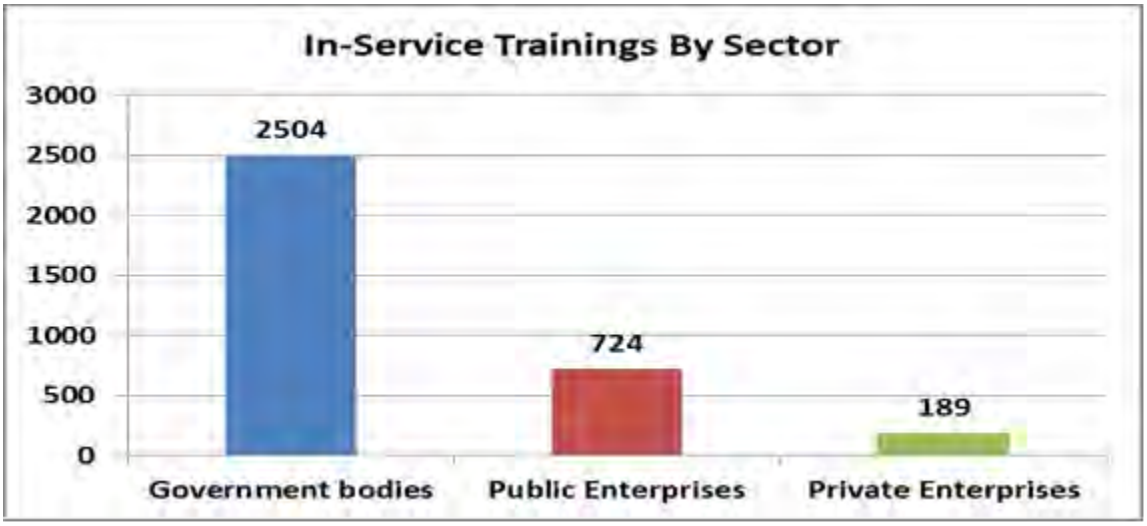
5.5 Education and Training Opportunities

5.5.1 In- Service Training

The respondents were asked the in-service training opportunities provided during the recent three years. In-service training is a short term training given to technical employees while they are at work.

Initially respondents were asked to respond if there has been any training provided to their technical employees in the last 3 years. From their responses gathered, it was possible to learn that 126 respondents have stated "Yes".

The survey spelt out which sectors have been involved a lot in organizing in-service trainings for their technical employees. The following graph provides the number of the beneficiaries who participated in the in-service training mentioned above.



Source: Labor Market demand Survey

Figure 20: In-service Training for Technical Employee Participants by Sector

Technical employees who have been working for the government sector have received better training opportunities compared to their public as well as private counterparts as shown in the figure above.

Respondents who replied "yes" were further asked to state the titles of the in-service trainings given in the last 3 yrs. The table below summarizes the most common responses provided.

Table 13. In Service Training Programs conducted to Technical Employees (including Engineers)

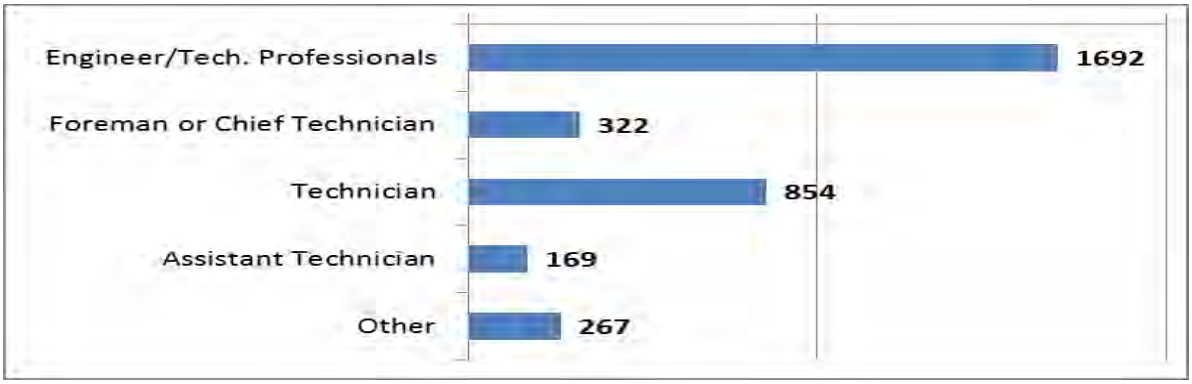
Areas of Training	Frequency
Electromechanical	31
Operation and maintenance	33
Water CAD, GIS and RS	23
Water Quality and treatment	20
Water supply and sanitation	23
Planning and resource management	7
Rope pump	7
Geology, Hydrogeology and Related	12
Drilling and related technology	14
Project and construction Management	19
Pump test and Pump installation	8
Water works construction ,design and study and related ones	34

Source: Labor Market Demand Survey

The major training courses provided for in-service training were technical and non-technical. Respondents have indicated quite a few of them but training participants differ substantially between courses and also same respondent might have participated more than one course within 3 years. Although there were no outstanding popular area of technology for in-service training, "Water works construction, design and study and related ones", "Operation and maintenance " Electromechanical", were relatively frequent.

It was also possible to acquire information on the in-service training targets. The figure below shows trainings organized by number of training targets.

There were 3,304 technical employees who have attended the trainings given as shown in the Figure below. 51% of the in-service training participants were engineers and other professional staffs. Technicians stood second with 26% of total number of participants. This means there were better training opportunities for higher level technical personnel than the middle level technical staffs during the last 3 years.



Source: Labor Market Demand Survey

Figure 21: In-service trainings organized by number of target Trainees

Finally respondents were asked to indicate who the training providers were. The following figure provides the answer.

Source: Labor Market Demand Survey

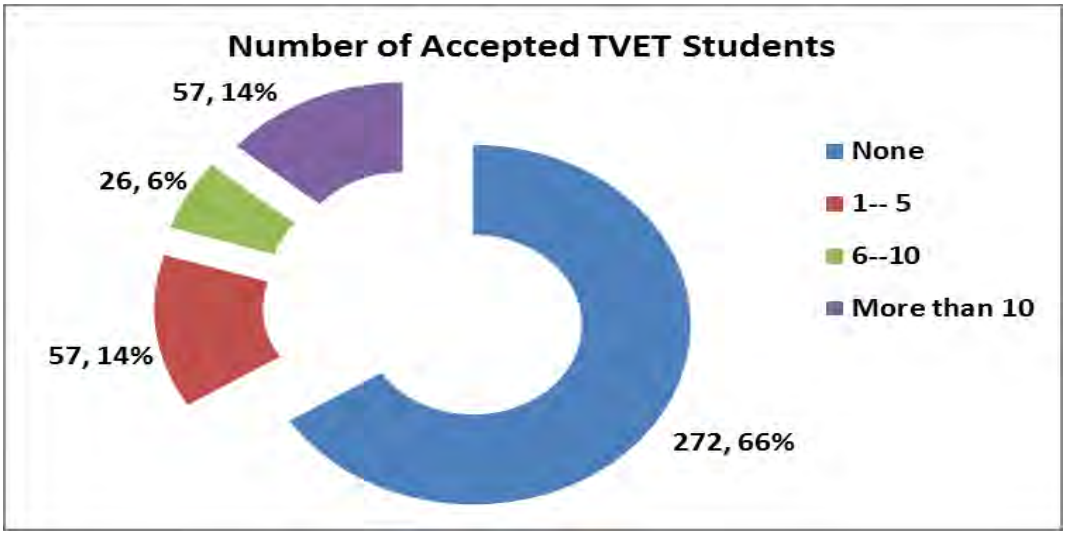
Figure 22 Number of Training Participants by In-Service Training Providers

As most of the trainings given have targeted engineers or technical professional, it is no wonder if universities were the second top training providers as shown in the figure above. Private as well as government institutions other than universities and NGO were also among the top providers. But TVET Colleges have been less active in the delivery of in-service trainings. This raises questions if TVET Colleges could take part more in short term skill upgrading trainings in the future.

5.5.2 Cooperative Training

The TVET system in Ethiopia has already commenced introducing a more dynamic mode of cooperative training delivery modality, like the apprenticeship in the German "dual system", and a 30/70 training modality, where trainees are engaged in basic theoretical training 30% of their time in TVET institutions, and 70% of their time in industry-based hands on practical training in the industry called "Cooperative Training". TVET institutions are actively engaging industries from already identified priority sectors, to provide cooperative training for the trainees. The "cooperative training" program which is formalized through signing of a memorandum of understanding between TVET & industry allows trainees to get practical experience through established companies and industries.

Respondents were asked to show if they have accepted TVET students on cooperative training during the last three years. As can be seen in the figure below, almost two thirds of respondents, (66%) have received no TVET students for cooperative training (a kind of apprenticeship program). The rest of the respondents have accepted quite few students from the different categories of TVET students as shown in the figure.



Source: Labor Market Demand Survey

Figure 23: Number of Organizations that has Accepted TVET Students

Respondents were further asked to indicate if there were problems associated with cooperative training programs carried out in their respective organizations. This is to learn a lesson for EWTI to start the long term training courses.

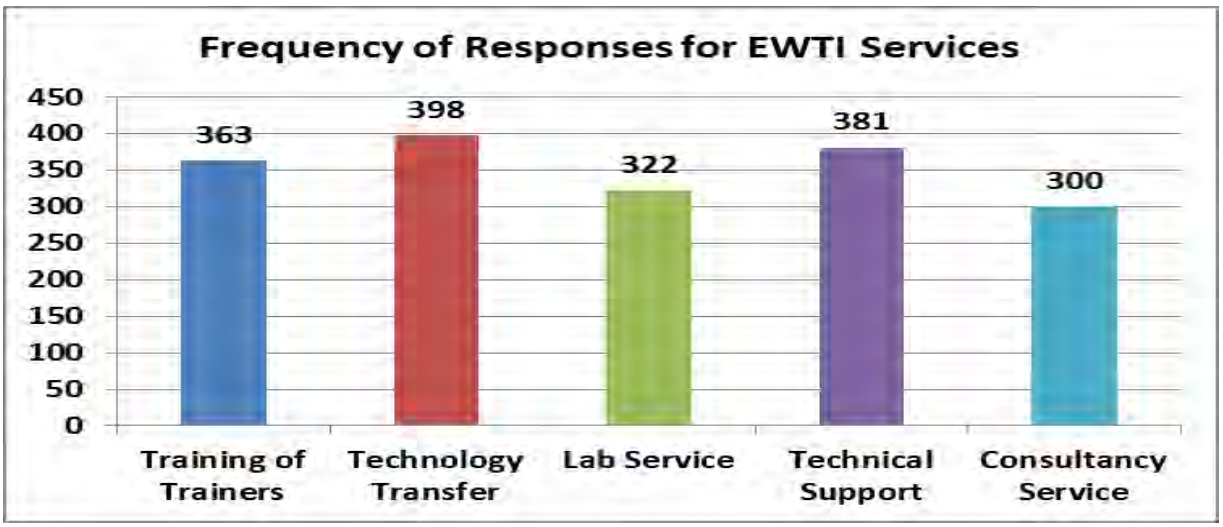
Up to three problems were indicted by the majority of respondents out of the prepared list of common problems. The "lack of expected skill" was found to be more frequent followed by "lack of expected knowledge" and "lack of seriousness" respectively. This result can put the quality of training at TVET Colleges under question.

Source: Labor Market Demand Survey

Figure 24: Problems in Cooperative Training

5.6 Training and Supports Expected from Ethiopian Water Technology Institute (EWTI)

The survey questionnaire consists of a query related to the services that respondents would like EWTI to provide other than training of technical employees. In this connection, with very close margin of differences among respondents, they all like EWTI to participate in all the services mentioned in the figure below. However, services in technology transfer technical support and training of trainers account for the major choices of respondents for EWTI services as shown in the figure below.



Source: Labor Market demand Survey

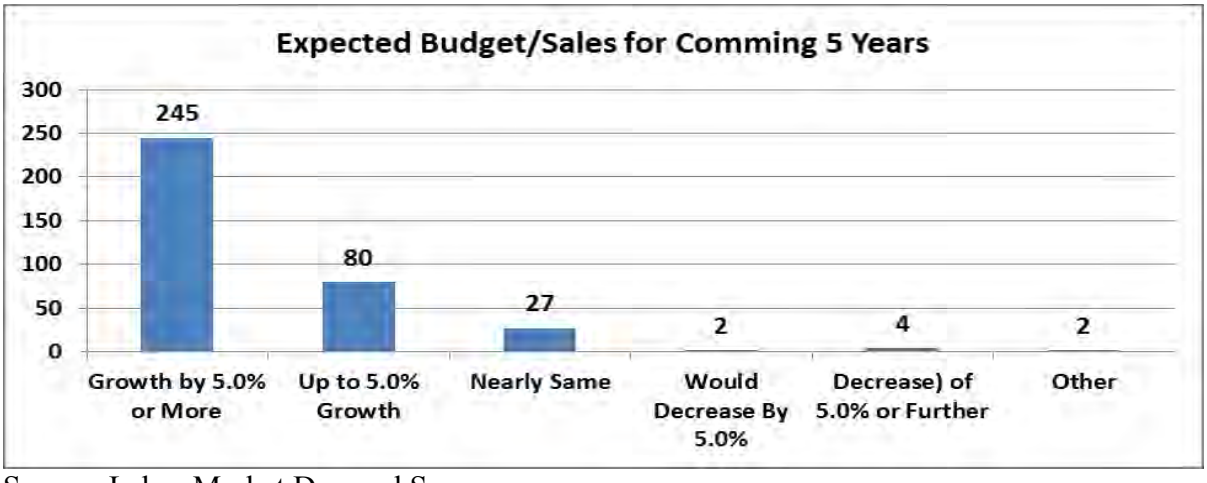
Figure 25: Respondents' Demand for Services from EWTI

5.7 Labor Demand of Water Technicians

5.7.1 Business Projection:

Business projection can tell a lot in terms of estimating future employment opportunities for technicians.

The future trend in terms of budget or sales forecast with these respective organizations has also shown that almost 90% of the respondents have replied by stating growth in budget/sales up to 5% or more while in 8% of them it remains the same as in the past. A declining budget/sales trend is also shown in the case of quite insignificant proportion of the respondents as indicated in the figure below.



Source: Labor Market Demand Survey

Figure 26: Expected Budget/Sales for the Coming 5 Years

Based on the findings above it can be said that with growth in budget or sales one would expect future demand for technical staffs and through it the demand for training to increase. In fact such trend could have a series of implications and some of these were explained previously in relation to other situations above.

5.7.2 Training in Perspective

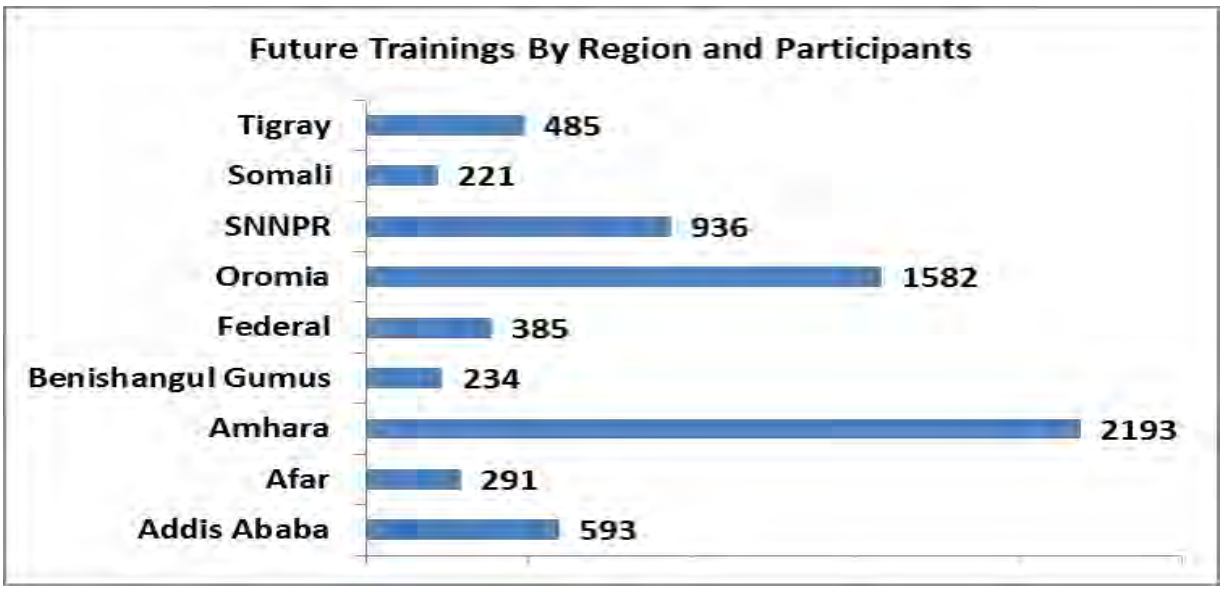
Business projections do also contain future training plan that the various organizations covered by the survey would like to organize for their employees. In this respect respondents have replied by stating the estimated number of technical professionals they would like to offer trainings in the coming five years. The following figure provides the summary.

Source: Labor Market Demand Survey

Figure 27: Future Trainings Participants by Number of Target Trainees

The findings from the figure given above suggest that future trainings needs for engineers or technical professionals as well as technicians is huge. Of the total planned training participants, 35% to be given is for engineers and other professionals while 33% for technicians. The target trainees put under "Others" category in the figure above refer to those with qualifications below Certificate level and consists of such employees as "Pump Operators", "Community Promoters", Sanitary Workers", "Irrigation Technicians", Water Meter Readers' and similar others. In this respect it can be said that the future demand for training appears to be good.

The distribution of future trainings by regions is also given in the figure below.



Source:Labor Market Demand Survey

Figure 28: Future Trainings by regions and Number of Participants

Source: Labor Market Demand Survey

Figure 29: Future Trainings Participants by Sectors

5.7.3 Future Training Areas

The questionnaire has also required respondents to indicate their responses about their future training demand for technical employees by category. A number of different training areas have been indicated. This information tried to group them under the closest major training areas. Then the groupings were later on ranked based on the frequencies of responses. For details see Appendix I.

As can be seen in Appendix 1, the most demanded training areas for:

Engineers and Technical professionals are;

- Construction management & Contract Administration
- Training on Application Softwares
- Geology & hydrogeology

For Foreman or chief Technicians the major training areas are;

- Construction management & Contract Administration
- Electromechanical & Machine Maintenance
- Surveying

For Technicians the major training areas are;

- Electromechanical & machine maintenance
- Operation and maintenance
- Plumbing

For Assistant Technicians the major training areas are;

- Electromechanical & machine maintenance
- Water Works construction
- Plumbing

For other professionals other than the above four categories as indicated in the questioner as "Others" the following are the top three indicated training areas.

- Administration & Finance
- Electromechanical & machine maintenance
- Water Treatment

5.7.4 Labor Demand Projections for Water Technicians

The recruitment plan for technical employees for the next five years is part of the survey question that addresses the central issue of the survey i.e. to find out labor market demand for water technicians. This is going to provide a basis of simply demand (employment) projection for technical employees in the coming five years.

The survey questionnaire has classified the employment plan into two categories.

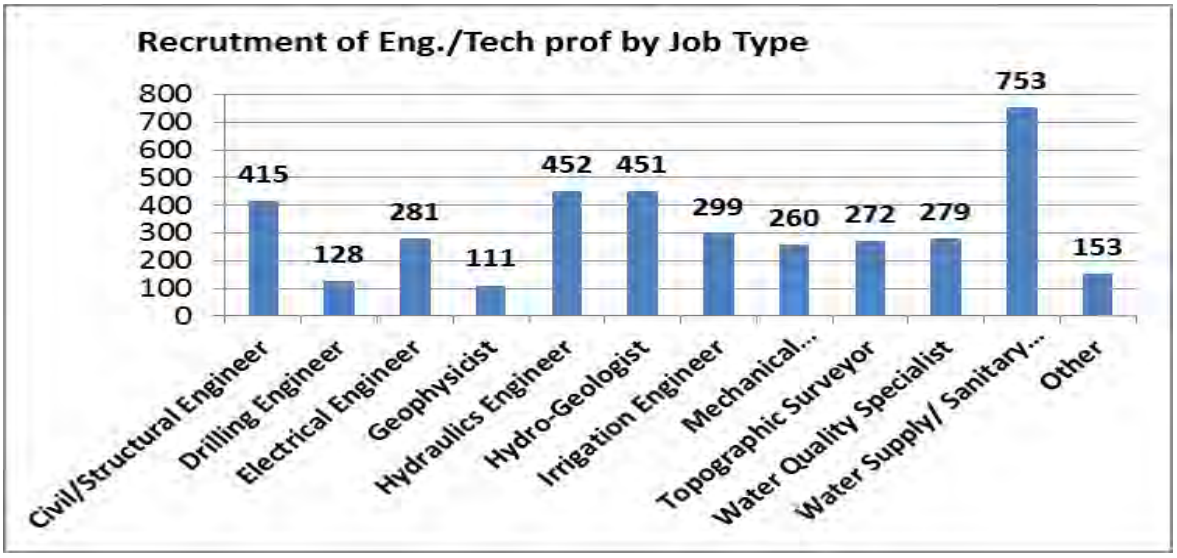
I. Demand for Engineers or Technical Professionals

II. Demand for Technicians and Assistant Technicians

I. Five Year Demand for Engineers and Technical Professionals

Engineers or technical professionals are those with higher level of skill and qualification, usually B.Sc. and above. The recruitment plan envisaged by responding organizations has spelt out their plan showing the number to be recruited by job type, by region and by sector. The following figure depicts the result of the survey.

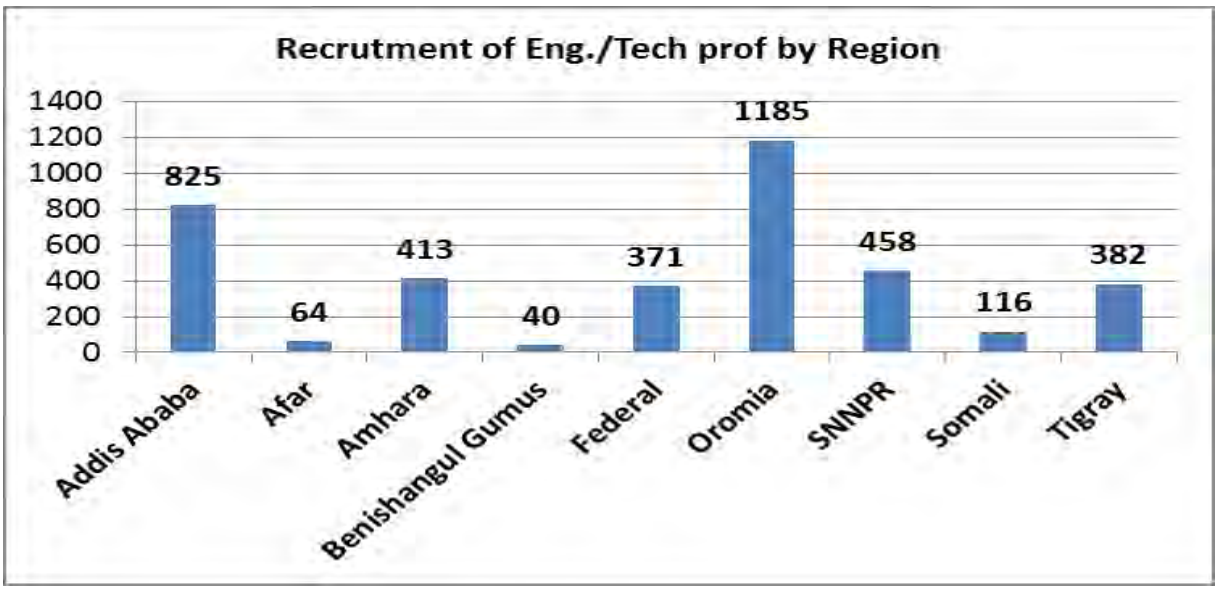
The Figure below shows that the demand for Engineers or Technical Professionals for the next five years (2015/16 to 2019/20) would be 3,854 among the surveyed organizations. The most highly demanded professional will be water supply engineer who accounts for 20% followed by hydro-geologist and hydraulic engineer by almost same magnitude i.e. 12% each.



Source: Labor Market Demand Survey

Figure 30 Recruitment Plan for Engineers by Job Type

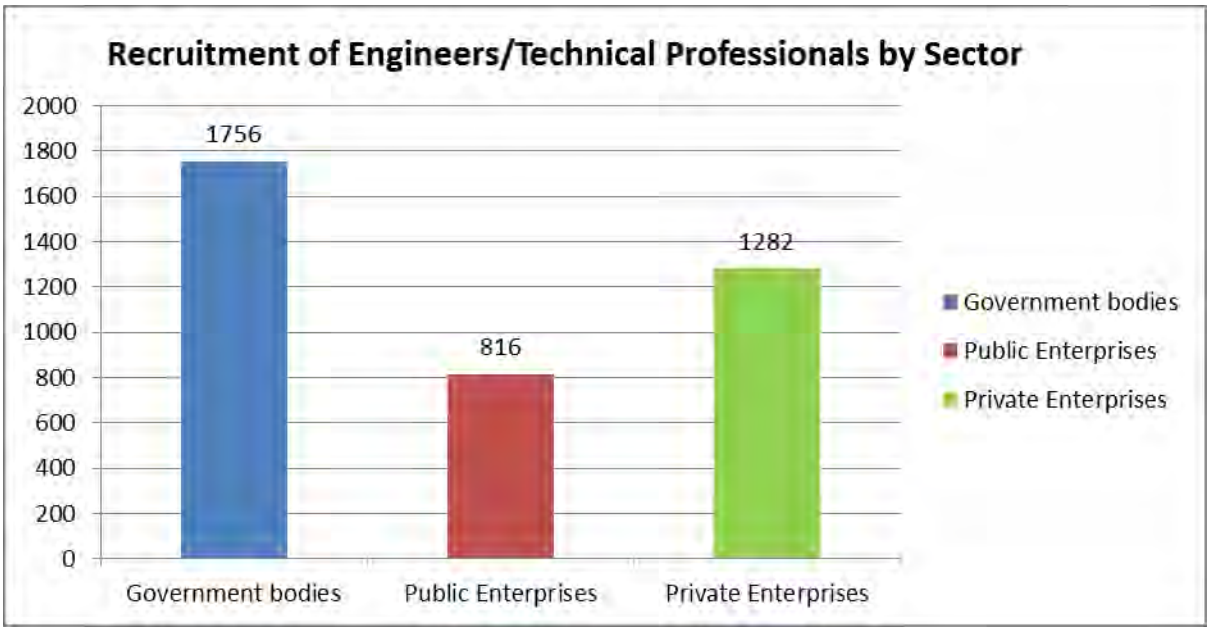
The Job market opportunities for engineers or technical professionals will emerge from Oromia region followed by Addis Ababa and SNNP regions in our surveyed respondents as can be seen in the following figure.



Source: Labor Market Demand Survey

Figure 31: Recruitment Plan for Engineers/Technical Professionals by Region

Sector wise, it is the government sector in our surveyed respondents which plans to employ the highest number of engineers as it is evident in the following figure.



Source: Labor Market Demand Survey

Figure 32: Recruitment Plan of Engineers by Sector

II. Five Year Demand for Technicians and Assistant Technicians

Among the surveyed organizations the recruitment plan for foreman or chief technicians, technicians and assistance technicians in the coming 5 years shows an overall employment level of 6,374. Of this total level of employment 23% (1,489) is accounted by foreman/supervisors, 49% (3,107) by technician while 28 % (1,778) by assistant technicians. This result is consistent when one sees the result by job type, by region and by sector as shown in the tables and figures given below.

Table 14: Five Years Recruitment Plan for Technicians by Job Type

5 Years Recruitment Plans for Technician by Job Type				
Technician Job Type	**No of Foreman or Chief Technician**	**No of Technician**	**No of Assistant Technician**	**Total**
Hydrology Technician	74	110	48	232
Mechanic/Drilling Machinery Maintenance Technician	245	296	198	739
Surveyor	203	216	131	550
Draft person/CAD operator	45	95	41	181
Driller	79	100	123	302
Electrician	90	248	81	419
Water Laboratory Technician	81	159	44	284
Soil Laboratory Technician	35	76	36	147
Welder	65	154	98	317
Plubmer	195	672	275	1142
Bar Bender	60	121	100	281
Painter	40	70	24	134
Carpenter	54	156	133	343
Mason	86	270	126	482
Heavy Equipment Operator	119	221	310	650
Other	18	143	10	171
Total	**1,489**	**3,107**	**1,778**	**6,374**

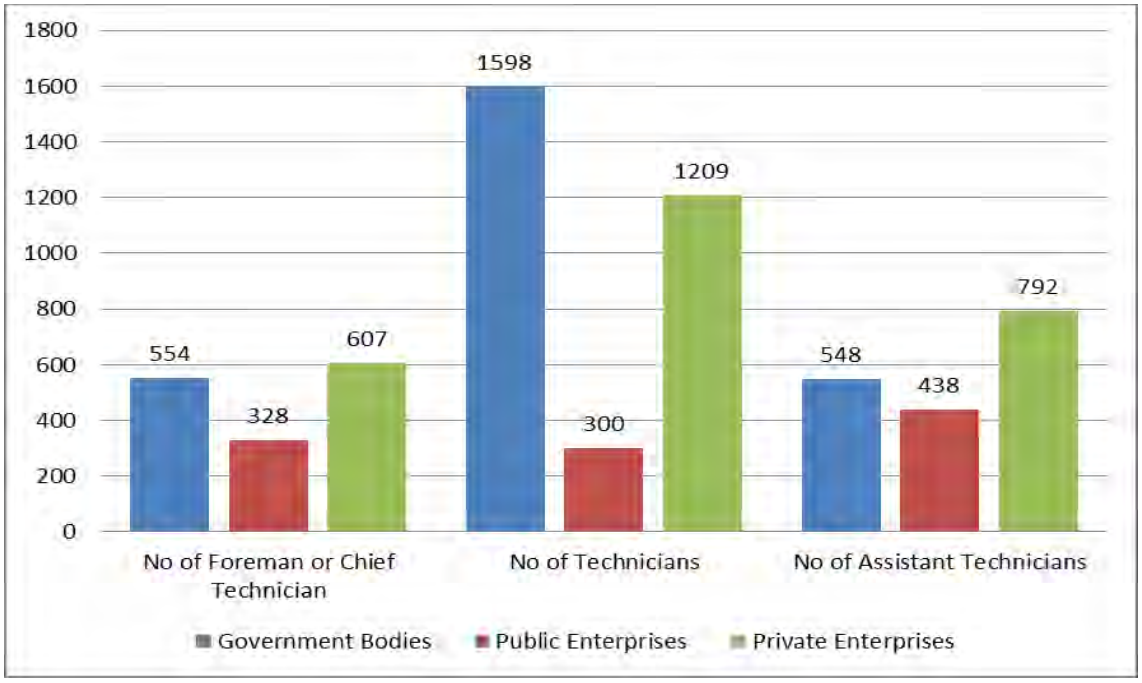
Source: Labor Market Demand Survey

When one particularly focuses on the 5 yrs. recruitment plan by job type, as can be seen in the table above, Plumbers, Mechanic/Drilling Machinery Maintenance, Heavy Equipment Operator, Surveyor, and Mason are among the top five technicians required in the coming years.

Table 15: 5 Yrs. Recruitment Plan of Technicians and Assistant Technicians by Regions

5 Years Recruitment Plan for Technicians by Region				
Region	**No of Foreman or Chief Technician**	**No of Technician**	**No of Assistant Technician**	**TOTAL**
Addis Ababa	544	1093	624	**2261**
Oromia	497	557	231	**1285**
Amhara	197	390	123	**710**
Tigray	76	272	202	**550**
SNNP	151	402	195	**748**
Afar	18	110	31	**159**
Somali		28		**28**
Benishangul Gums	6	19		**25**
Federal		236	372	**608**
TOTAL	**1,489**	**3,107**	**1,778**	**6,374**

Source: Labor Market Demand Survey



Source: Labor Market Demand Survey

Figure 33: 5 Yrs. Recruitment Plan for Technicians by Sector

III. Five Year Demand Projections for Technicians in the Water Sector Organizations

Having put down the 5 year projected demand (recruitment plan) for Engineers and Technicians as expressed by surveyed organizations above, attempts were also done to estimate the 5 year demand for all sorts of technicians across the water sector organizations. The rough projections were attempted for the private sector and public sector organizations together while another projection for government organizations following an acceptable procedures and processes[13] (For the details of calculation, see Appendix 4). Finally the findings were summarized and put forward in single for the whole water sector.

The demand for technicians (Chief Technicians, Technicians and Assistant Technicians) in the coming five plan period (2015/16 to 2019/20) amounts to **31,144**. When disaggregated by sector, we get the following. The Tables below show details on the demand projections.

- **For the government sector …….. 6, 200 Technicians**
- **For the Public and Private Sectors ….. 24, 944 Technicians**

Table 16: 5 Yrs. Labor Demand Projections for Technicians across Gov't Orgs. in the Water Sector

S/N	Region	Total Projection
1	Addis Ababa	620
2	Afar	130
3	Amhara	1,450
4	Benishangule Gumuz	132
5	Gambela	108
6	Oromia	1,987
7	Somali	599
8	SNNPR	692
9	Tigray	470
10	Hareri	7
11	Dired Dawa	5
	Total	**6,200**

[13] The labor market projection was pursued by the calculation of "the average number of technicians planned to be recruited" of the surveyed organizations by types of organizations (and company grade) multiplied by "the total number of organizations."

Table 17: Labor Demand Projections for Technicians across the Public & Private Sectors

Grade	WWC Organizations			Wwell Drilling Org.			WWConsultancy Org.			Sanitary Works			Total Recuirui tment
	Total No. Of Comp.	Average Recurit ment Plan of Tech.	Total Recurit ment Plan	Total No. Of Comp.	Ave. Recurit ment Plan of Tech.	Total Recurit ment Plan	Total No. Of Comp.	Average Recurit. Plan of Techn.	Total Recurit ment Plan	Total No. Of Comp.	Ave. Recurit ment Plan of Tech.	Total Recuri tment Plan	
Grade 1	**93**	51	4743	**37**	14	518	**4**	15	**60**				
Grade 2	**20**	28	560	**0**			**1**		**0**				
Grade 3	**126**	29	3654	**22**	7	154	**4**	3	**12**	4	6	**24**	
Grade 4	**60**	35	2100	**3**	6	18	**1**		**0**			**0**	
Grade 5	**228**	25	5700	**9**	6	54	**17**	2	**34**	1	3	**3**	
Grade 6	**327**	21	6867	**3**	6	18	**11**	2	**22**				
Grade 7	**40**	6	240										
Grade 8	**28**	5	140										
Grade 9	**5**	4	20										
Grade 10	**1**	3	3										
TOTAL	**928**		**24,027**	**74**		**762**	**38**		**128**	5		**27**	**24,944**

Source: Computations done by AG Consult Study Team based on data sources from MoWIE and EWTI

The GTP II of the Ministry of Water, Irrigation and Electricity (MoWIE) has also planned 13,000 medium professionals required by the sector for the plan period covering 2016 to 2020. By medium professional it is meant water technicians, electromechanical technicians and drillers. The same GTP II from MoWIE does also indicate that 4, 374 higher level professionals are required for the same plan period. Higher level professionals include water engineers, geologist, hydrogeologist, hydrologists, electromechanical Engineers, Sociologist, Economists, others.

EWTI's GTP 2 planned to train 4, 625 sector professional and technicians from government and non-government organizations including the private sector.

6 Existing Equipment and Software

Survey supervisors and surveyors were required to take relevant data on existing equipment, instruments and software which was part of the survey questionnaire. However, data taking in this regard has been limited to one of taking notes of or making copies of lists of equipment and software that organizations use frequently. Where possible observations were made to see existing conditions and states of these facilities and captured photos. See Appendix 2.

In government Organizations the following equipment and /or software were observed:

- Leveling & Total Station surveying equipment, GPS
- Auto Cad, Water Cad, Global Mapper, Hec Ras, Epanet, Arc GIS,
- GPS; water quality analysis instruments, plumbing equipment, electromechanical equipment maintenance tools, surveying equipment, etc.,

In Private sector,

- RIGs, Compressors, mud pumps, chain blocks, cranes, submersible pumps, generators
- Grader, Excavator, Loader, Compactor, Mixer, Vibrator, Welding machine, water pump, etc.,

In Public Enterprises,

- Aquitest, Resistivity survey interpretation software, Surfer, Arc GIS,
- RIG Types: (MI 50 RIG , MI 28 RIG, G 45 RIG, G 38 RIG, G 30 RIG, G 25 RIG, G 20 RIG, Super Rock RIG, Tone RIG, TH 10 RIG, R 50 RIG, ERO RIG,) , Borehole TV camera, Compressor, mud pump, electric al logger
- Soil, Construction material and Water Quality Testing Laboratory equipment; leveling & Total Station surveying equipment, GPS etc.,

7. Respondents' Free Comments and Surveyors' Observation

Summary of the comments given by respondents and surveyors are presented below. Please refer to Annex 7 for the original comments.

A. Government

- Thank you for interviewing and giving a chance to identify our problem. Please try to change this survey to practical for change;
- Skill upgrading practical training on leakage control, water meter testing, and renewable/green energy is a priority;
- We expect the knowledge and skills of technical staffs to be upgraded so that they can be engaged in technology transfer and research works.
- Long term as well short term training is very important in order to upgrade the skill and knowledge of water sector professional at all levels. It was also emphasized that such trainings need to be carried out on a regular basis.
- The training of drillers is important as it helps to minimize the manpower shortage in the field;
- EWTI's trainings mainly focus on geologist and drilling technicians. It lacks training in water supply system design, water treatment operators, plumbing, surveying etc.;
- Training and support is required on capacity building and material/instrument/logistics (e.g. motor cycle, laptop) support;
- There is knowledge and skill gap in pump installation and testing which needs urgent attention;
- Thanks to EWTI that show will to search the main challenges in the water sector; employees are almost none trained except few job positions. They work by experience gained from relative;
- The questionnaire does not include questions related to training for non-technical employees i.e. planning, socio economic, water quality analysis, administration and finance.
- Not only technical department, but also financial, customer service, etc. of the utilities have skill gap. We need training for running systems of GTP program.
- To meet goals of GTP we need training/ technical support and equipment;
- Water board administration is not functioning well.

B. Public

- Refresher courses & diploma level training for drilling engineers, mechanical engineers will have great contribution for the country;
- For the sector development there should be training on software application as it can contribute to water sector development.
- EWTI should improve its training methodology and include advanced software training on practical design of water supply system ;

- Training is an important task that can enable an organization to upgrade the capacity of organizational culture of learning and innovation.
- The questions are vast that need more time to answer by different persons with different fields and experience.

C. Private

- We appreciate labor market survey that aims to strengthen training in water sector/ appreciate survey including private sector;
- We appreciate the effort made by EWTI/JICA to improve the skill of professionals and technicians through training provision;
- The training should include all regions and the private sector.
- It is important to start training immediately on drilling operators and mechanics and/or technicians for the private sector;
- This questionnaire emphasized on drilling and drilling related issues. It would be better if it is expanded to other professions like the issue of contract administration and construction supervision;
- The anticipated training programs should be designed to solve the skill gap at all level;
- Supporting in capacity building for all water works contractors in Ethiopia may have a significant role in upgrading the water sector's capacity to overcoming current problems like, in machinery maintenance, contract administration and project management and others.
- The training service should focus on practical knowledge;
- Some of the questions in the questionnaire are too vague to answer or it's out of our organizations scope.
- We hope to get a result of this labor demand survey.

Surveyors' Observation

- In most selected Woredas and Town Water Supply and Sanitation Enterprises, the guards are also involved in water related activity. This implies that water technicians are in short supply. Hence we recommend that training be provided widely to fill gap.
- There has been high demand for training everywhere. This has been the single most critical problem survey teams have observed.
- Very few technicians are available in most Woredas.
- The respondents were not able to immediately respond to the questionnaire and took more time
- Water technician are also assigned in other activity rather than water related activities
- In some small towns water committee members who undertook water supply activities have no proper office. They are under the supervision of Woreda water, mineral and energy office.

8. Conclusion and Recommendations

8.1 Conclusion

A field level survey has been undertaken across eight regional states in Ethiopia to study the labor market demand for water technicians. A total of 1,001 organizations were selected to participate as respondents. These selected organizations belong to government sector (451), Private (531) and public (19) all of which are currently working in the water sector.

Of the total selected 1,001 respondents, it was possible to cover 685 of them by delivering the survey questionnaires but only 424 respondents have filled out the questionnaires and returned for analysis.

The survey findings were presented in details in section 5 above. The following is just a summary.

I. Basic Findings:

A. The number of technical employees working with the various organizations covered by the survey is 10,875 (44%) of the total employment level of 24,750. Technical employees consist of engineers/technical professionals, technicians and assistant technicians.

B. Among the technical employees surveyed, technicians account for 58% (6,002) while engineers and assistant technician account for 35% (3,651) and 7% (757) respectively. The government sector among the top employer of technicians next to public sector in our sample.

C. When one looks at the educational profile of technicians, 50%, of them have attained Diploma or completed TVET Level III though 12% the surveyed technicians and assistant technicians have reached Level IV. The next step would be towards Advanced Diploma or Degree. As most assistant technicians attained certificate level qualification, further training towards level II and IV is unavoidable. There are over one quarter of technicians (including assistant technicians) who have neither one of those educational attainment. They may have inadequate education and training to work as technicians.

D. The current minimum level of salary scale coupled with low level of job position makes further training imperative assistant technicians

E. The gender composition within the rank of technicians and assistant technicians is pro-male bias. In this respect the survey has pointed out males to be 83%. The implication is that as more and more females are drawn into TVET colleges, which are consistent with

TVET policy and strategy, and join the labor force the demand for training in technical areas would increase.

F. The challenges faced by technicians and assistant technicians in their respective organizations have triggered by the lack of required technical skills and low level of salary being paid. It can be said that these could be overcome, among other factors, through further skill upgrading training and long term training.

G. High turnover of technicians is found out to be the single most glaring problem facing the organizations covered by the survey. The cause for such a high turnover could be the result of factors internal to these organizations but also external factors do influence it. Internal factors could be harnessed through, among others, the provision of higher level training opportunities to technicians and other sections of technical staffs.

H. In-service trainings provided in the past three years to technical employees indicate engineers/technical professionals to have benefited most compared to other sections of the technical employees. It was found out that the role of TVET Colleges, be it government or private, as training provider has been very marginal compared to Universities and other training providers. Of course this is no wonder as most of the training organized have targeted engineers and other high level professionals.

I. Based on the responses gathered from respondents on the question posed on Cooperative Training the training at TVET level was found out to be below expectation in terms of skill and knowledge acquisition most of all.

J. The prospect for growth and for further training appear to be good when one looks at the trend in expected budget (government organizations) or sales (private and public enterprises) for the coming 5 years. In this regard, almost 90% of the respondents have replied expected budget growth of 5% and above. It shows future prospect for employment and training would be great.

K. Training plans of the different organizations covered by the survey for technical employees target engineers or technical professionals and technicians on almost equal magnitude (44% each). Assistant technicians are far below.

L. Of all the possible services expected of EWTI, respondents prefer technology transfer followed by technical support and training of trainers put down by order of importance.

II. Core Findings:

Market demand for technical employees among the surveyed organizations

i) Demand for engineer's stands at 3,854 in the coming 5 years among the surveyed organizations.

- By job type
  - ❖ Water Supply Engineer – is the single most demanded profession followed by Hydraulics Engineer and Hydro-geologist among the top
- By Region – Oromiya, Addis Ababa and SNNP are among the regions where there will be high demand
- By Sector – the government sector will be the highest employer

ii) Demand for technicians (combining with chief technicians & asst. tech) for the coming 5 years is 6,374.

- By job type
  - ❖ Plumber, Mechanic/Drilling Machinery Maintenance Technicians, Heavy Equipment operator will be among the most wanted
  - ❖ Plumbers, Mechanic/Drilling Machinery Maintenance, Heavy Equipment Operator, Surveyor, and Mason
- By Region – Addis Ababa is where there will be the highest demand
- By Sector –Government is among the top to employ technicians

M. In the Growth and Transformation Plan (GTP) II of the Ministry of Water, Irrigation and Energy one can find that during the planning period 2016-2020 overall 527,874 work forces are required of which 4,374 are higher and 13,000 medium professionals and the remaining 510,500 are artisans and care takers. In GTP II it is planned that the higher and medium professionals would be trained by government and private sectors' universities and colleges while artisans and care takers would be trained by regions, zones, Woredas and Woreda WaSH Consultants (WWCs). Moreover, the JICA supported EWTI is considered to provide training in borehole drilling and other relevant skills.

N. EWTI's GTP II envisaged training 4,625 sector professional and technicians from government and non-government organizations including the private sector.

O. The demand for technicians (Chief Technicians, Technicians and Assistant Technicians) in the coming five plan period (2015/16 to 2019/20) amounts to 31, 144 according to the independent projection made by the Consultant across the water sector. When disaggregated by sector, we get as follows.

- For the government sector …….. 6, 200 Technicians
- For the Public and Private Sectors ….. 24, 944 Technicians

8.2 Recommendations

The labor market demand survey was intended to assess the demand for water technicians in the water sector. This survey is an important milestone for launching training program in technical and vocational training. EWTI has been established as a public institute and intends to start long term training in addition to the short term training it has been providing for many years. TVET Policy and strategy emphasizes that training is demand driven and that certification is based on labor market analysis

The labor market demand survey is now completed. The preliminary findings suggest the existence of high market demand for technicians and assistant technicians in the sector. As per the findings, 10,228 technical employees (3,854 Engineers + 6,374 technicians) are demanded in the coming 5 years /2015/16 to 2019/20/). This is verified by the survey where 424 respondents from the government, public and the private sector have been involved as respondents. In addition, there will be a sector wide labor demand of 31,144 technicians for same period running. In GTP 2, 13, 000 medium level technicians and 4,374 higher level professional are planned to be employed.

Overall one can suggest the following recommendations.

Once EWTI makes sure there is demand for water technicians, it has to embark on the following tasks.

a. EWTI needs to prioritize the training based on the indicated areas of training by the respondents as summarized in section 5.7.3;
b. Collaborate with well-established colleges in the private as well as government sector to share experiences which is vital to start a long term training;
c. Sort out its curriculum at hand in the light of the needs stated;
d. EWTI need to work closely with the private sector for all kind of training and services;
e. The Institute needs to maintain good networking with rest of sector stakeholders and always keep track of changes that take place within the sector.

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Appendices

Appendix 1 - Tables on prepared on “Future Training Plans”

Appendix 2 - List of Equipment & Software

Appendix 3 – Total Employment in the Water Sector

Appendix 4 – Projected Private and government Recruitment Plan

Appendix 5 - Photo Album

Appendix 6 – Questioner used for the survey

Appendix 7 – Respondents’ Free Comments

Appendix 1 - Tables on prepared on "Future Training Plans"

Table – Areas of training indicated by respondents

1. Engineer/Technical Professional		2. Foreman or Chief Technician		3. Technician		4. Assistant Technician		5. Other	
Indicated training areas	**%**	**Indicated training areas**	**%**	**Indicated training areas**	**%**	**Indicated training areas**	**%**	**Indicated training areas**	**%**
Civil Engineering	2.49%	Carpenter	0.25%	Drilling Technology	0.88%	Electromechanical & machine maintenance technician	23.47 %	Administration & Finance	16.50%
construction management & Contract Administration	11.46%	Construction Management & Contract Administration	40.05 %	Electromechanical & machine maintenance technician	35.95%	Lab technician	2.29%	Billing and Customer service	2.01%
Design of Water Supply Systems	9.51%	Drilling Technology	1.74%	Laboratory Technician	4.18%	Masonry	1.53%	Community participation & Water committee	14.08%
Drilling Technology	0.10%	Electromechanical & Machine Maintenance	17.91 %	Masson	0.36%	Operation & maintenance of Water Schemes	3.05%	Electromechanical & machine maintenance technician	17.40%
Electromechancal Engineering	1.56%	Masonry Works	0.25%	Operation and maintenance Technician	16.92%	Plumbing	64.69 %	Hydrogeology	1.21%
Geology & hydrogeology	27.94%	Operation and maintenance water Schemes	3.48%	Plumbing	28.37%	software	0.76%	Leadership	0.10%
Geophysical Survey	0.59%	Plumbing	8.46%	software	5.05%	Surveying	0.38%	Operation and maintenance	7.65%
Geotechnical Engineering	0.20%	software	0.25%	Solar Technology	0.05%	Water Works construction	3.80%	Plumbing	0.30%
Groundwater Modeling	0.10%	Surveying	26.87 %	Surveying	0.26%	Welding	0.38%	Software	0.40%
Hydraulic Engineering	0.34%	Welding	0.75%	Water works construction	7.99%			Water Treatment	40.24%

1. Engineer/Technical Professional		2. Foreman or Chief Technician		3. Technician		4. Assistant Technician		5. Other	
Hydraulic Modeling	0.15%			Welding	0.36%			water works construction	0.10%
Hydrology	2.00%								
Irrigation & Drainage	1.37%								
Operation & Maintenance Water Schemes	1.07%								
Software	37.74%								
Structural Engineering	0.24%								
Water Resources Study & Design	3.27%								

Appendix 2 - List of Equipment & Software

The following are equipment, instruments and software frequently used by the organization:

Table:- 1 Software's frequently used by water sector role players/stakeholders

Government Water Offices		**Public Enterprises**		**Private Enterprises**	
Organization	**Software**	***Organization***	**Software**	***Organization***	**Software**
WRB	Auto Cad, Water Cad, Global Mapper, Hec Ras, Epanet, Arc GIS,	***Water Well Drilling Enterprise (WWDE)***	Aquitest, Resistivity survey interpretation software, Surfer, Arc GIS,	***Water Well Drilling Contractors***	Auto Cad, Aquitest, Aquachem
Zone &Woreda	Auto Cad, Storm Cad, Water Cad, Global Mapper, Hec Ras, Epanet, Arc GIS,	***Water Work Construction Enterprise (WWCE)***	Auto Cad, Water Cad	***Water Work Construction***	Auto Cad, Water Cad
WSS	Auto Cad, Water Cad, GIS software; Billing, stock and operation management system software	***Water Works Design , Supervision Enterprise (WWDSE)***	Auto Cad, Water Cad, SAP,	***Water Works Design , Supervision Consultant***	Auto Cad, Water Cad, Global mapper, GIS, Geophysical survey software, Aquitest, Aquachem

Table:- 2 Equipment frequently used by water sector role players/stakeholders

Government Water Offices		**Public Enterprises**		**Private Enterprises**	
Organization	**Equipment**	***Organization***	**Equipment**	***Organization***	**Equipment**
WRB	leveling & Total Station surveying equipment, GPS,	***Water Well Drilling Enterprise (WWDE)***	RIG Types: (MI 50 RIG , MI 28 RIG, G 45 RIG, G 38 RIG, G 30 RIG, G 25 RIG, G 20 RIG, Super Rock RIG, Tone RIG, TH 10 RIG, R 50 RIG, ERO RIG,) , Borehole TV camera, Compressor, mud pump, electric al logger	***Water Well Drilling Contractor***	RIGs, Compressors, mud pumps, chain blocks, cranes, submersible pumps, generators
Zone &Woreda	GPS, leveling & Total Station surveying equipment; water quality analysis instruments	***Water Work Construction Enterprise (WWCE)***	Crane, Dozer, Grader, Excavator, Loader, Damper, Compactor, Crasher, Generator, Mixer, Truck Mixer, Vibrator, Welding machine, water pump, etc.,)	***Water Work Construction***	Grader, Excavator, Loader, Compactor, Mixer, Vibrator, Welding machine, water pump, etc.,)
WSS	GPS; water quality analysis instruments, plumbing equipment, electromechanical equipment maintenance tools, surveying equipment,	***Water Works Design , Supervision Enterprise (WWDSE)***	Soil, Construction material and Water Quality Testing Laboratory equipment; leveling & Total Station surveying equipment, GPS,	***Water Works Design , Supervision consultants***	leveling & Total Station surveying equipment, GPS, Geophysical survey instruments

Appendix 3 – Total Employment in the Water Sector

Type of organization	Managers./ Supervisors	Technical Employees.	Admin. /clerical Emp.	Support Employees	Total No of Employees per surveyed Organizations	Tech. Employees to Total in %	Average No. of Employees	Population size	Total Water Sector Employ
Regional Water Bureau	110	532	152	694	1,488	36%	213	9	1,917
Zonal Water Office	84	439	40	243	806	54%	22	45	990
Woreda Water .Office	375	1,587	60	519	2,541	62%	13	700	9,100
Town Water Supply & Sanitation Services	446	2,530	2,056	3,892	8,924	28%	43	467	20,081
Water Works Construction Enterprise (WWCE)	143	2,765	597	2,091	5,596	49%	700	8	5,600
Water Works Design & Supervision Enterprise (WWDSE)	105	1,607	215	452	2,379	68%	297	8	2,376
Water Works Drilling Enterprise (WWDE)	28	249	39	103	419	59%	140	3	420
Water Works Construction Company	132	786	246	595	1,759	45%	4	920	3,680
Water Works Drilling Comp.	55	267	116	198	636	42%	12	71	852
Water works Consulting Companies	18	104	27	38	187	56%	6	30	180
Sanitary WC Company	2	8	3	2	15	53%	3	5	15
TOTAL	1,498	10,874	3,551	8,827	24,750	44%			45,211

Government Organizations - Total Number of Organizations

Region	TWSS	WW Office	Zone Water	RW Bureau	Total
Oromiya	142	265	18	1	**426**
Amhara	155	129	10	1	**295**
Tigray	59	34	0	1	**94**
SNNP	65	138	14	1	**218**
Afar	8	32	0	1	**41**
Somali	16	68	0	1	**85**
B-Sh. Gum.	10	20	0	1	**31**
Gambela	9	13	3	1	**26**
Harari	1	0	0	1	**2**
Dire Dawa	1	1	0	0	**2**
Addis Ababa	1	0	0	0	**1**
Total Pop.	**467**	**700**	**45**	**9**	**1,221**
Sample Size	**210**	**197**	**36**	**7**	**450**

Appendix 4 – Projected Private and government Recruitment Plan

Grade 1 Private and Public Water Works Contractors recruitment Plan

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
ABEBE NEGASH GENERAL CONTRACTOR	Water Work Construction	11	22	37	70	1
AMIBARA GENERAL CONSTRUCTION	Water Work Construction	3	16		19	1
ANSIF CONSTRUCTION	Water Work Construction	36	36	36	108	1
AWASH WOLDAY GENERAL CONTRACTOR	Water Work Construction	7	46	6	59	1
BERHE HAGOSE	Water Work Construction	14	6	58	78	1
COSMOS ENGINEERING & COMMERCE PLC	Water Work Construction		12		12	1
DEGENA ASSEFA WWC	Water Work Construction	67	66		133	1
FAMCON WATER WORKS & GENERAL CONTRACTOR	Water Work Construction	4			4	1
HAWA ADEM GENERAL CONTRACTOR	Water Work Construction		1		1	1
KASSAHUN MILLION CONSTRUCTION	Water Work Construction	12	46	33	91	1
KATEKSE ENGINEERING AND TRADING PLC	Water Work Construction	9	8	2	19	1
KIBROM DESTA GENERAL CONTRACTOR	Water Work Construction	30	76	121	227	1
SAMUEL NEGASH GWWC	Water Work Construction		3		3	1
TARIKU G/MESKEL WATER WORKS CONSTRUCTION	Water Work Construction		3	21	24	1
ZELEK REDI BELACHEW	Water Work Construction	31	93	57	181	1
ALI MOMINE ALI	Water Work Construction	7			7	1
GEMTA CONSTRUCTION CONSLTING ENGINEERS PLC	Water Work Construction	1	7	1	9	1
GETACHEW ASSEFA BC & WWC	Water Work Construction		6		6	1
MELCON CONSTRUCTION	Water Work Construction	15	36	34	85	1
Oromia Regional State	Water Works Construction Enterprise (WWCE)	14	46	0	60	1
Amhara Regional State	Water Works Construction Enterprise (WWCE)	0	0	0	0	1
Tigray Regional State	Water Works Construction Enterprise (WWCE)	0	0	0	0	1
SNNP Regional State	Water Works Construction Enterprise (WWCE)	2	0	3	5	1
Afar Regional State	Water Works Construction Enterprise (WWCE)	5	3	5	13	1
Somali Regional State	Water Works Design and Supervision Enterprise	8	0	5	13	1

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
	(WWDSE)					
Benishangul Gumuz Regional State	Water Work Construction	2	2	1	5	1
Federal Government	Water Works Construction Enterprise (WWCE)	12	0	27	39	1
Total of grade 1					**1,271**	
Average					**51**	

Grade 2, 3 & 4 Private Water Works Contractors recruitment Plan

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
SABERCON ENGINEERING	Water Works Construction	14		14	28	2
Total					**28**	
ALEMU SISAY W.W.G & B.G CONSTRUCTION	Water Works Construction	2	6	11	19	3
ANWAR JIHAD GC3 WWC3	Water Works Construction			2	2	3
ASFAW AFERA WATER WORKS	Water Works Construction		22		22	3
ATS ENGINEERING	Water Works Construction	24	48		72	3
DEREGE DARGIE WWGC	Water Works Construction		30		30	3
ERMIAS MERGIA GC & WATER WORKS CONSTRUCTION	Water Works Construction	7	6	4	17	3
GIRMA TAFESSE GENERAL CONTRACTOR & WATER WORKS	Water Works Construction	11			11	3
RIVAN CON Engineering PLC	Water Works Construction	3	27		30	3
SAMUEL GETACHEW WATER WORKS GENERAL CONTRACTOR	Water Works Construction	19	13	24	56	3
TAM GEO ENGINEERING	Water Works Construction	2	14	26	42	3
ZENEBE ZEWDIE G.C.	Water Works Construction		10		10	3
GOJO ENGINEERING	Water Works Construction		30	4	34	3
YIFREDEW ABREHAM BUILDING & WATER WORK	Water Works Construction	21	27	24	72	3
Hatlay Argawi Water Work Contractor	Water Works Construction		22		22	3

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
ABYOTAYKA GENERAL WATER WORKS CONTRACTOR	Water Works Construction	8	11	9	28	3
B.C.GENERAL CONTRACTOR	Water Works Construction	4	7	10	21	3
KINFEWUBE GENERAL WATER & SIMILAR WORKS	Water Works Construction		12		12	3
Total of Grade 3					**500**	
Average of Grade 3					**29**	
HECON G/C	Water Works Construction	6	19	10	35	4

Grade 5 Private Water Works Contractors recruitment Plan

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
AGFT CONSTRUCTION PLC	Water Works Construction	10		2	12	5
AKA CONSTRUCTION	Water Works Construction	9			9	5
Arad water work construction plc	Water Works Construction	3	10		13	5
DEJEN ASMARE WATER WORK CONSTRUCTION CONNTRACTOR	Water Works Construction	2	5		7	5
FISEHA GIDEIS	Water Works Construction		2		2	5
G/Ananin Mehari Water Work Contractor	Water Works Construction		14		14	5
LEMMA EDEA G.C AND WWCC	Water Works Construction	21	8	8	37	5
MERICON CONSTRUCTION	Water Works Construction	3	20		23	5
MUBAREK AHMED GWWC	Water Works Construction	29			29	5
ASRAT TADESSE WATER WORKS CONTRACTOR	Water Works Construction	2	8		10	5
HIKAS ENGINEERING @ TRADING PLC	Water Works Construction	11	26	8	45	5
KIBROM GEBREKRSTOS WORROTA	Water Works Construction	13	9		22	5
LEMMA ASSEFIE WATER WORKS CONTRACTOR	Water Works Construction	4			4	5
GUTEMA FIRISA CONSTRUCTION	Water Works Construction	31	54	63	148	5

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
MOHAMMED YIMER CONTRACTOR	Water Works Construction	7	7	6	20	5
WORKU W/TADIK W.W.C	Water Works Construction		1		1	5
Total of Grade 5					**396**	
Average					**25**	

Grade 6 Private Water Works Contractors recruitment Plan

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
GULILAT HABTAMU W.W.C	Water Works Construction		1		1	6
KIBRAN GENERAL CONSTRUCTION	Water Works Construction		18		18	6
MASTEWAL DESALEGN WATER WORKS GENERAL CONTRACTOR	Water Works Construction	20	3		23	6
MILLION FENTA W.W.C	Water Works Construction		2		2	6
TIRUNEH DEBAY WATER WORK	Water Works Construction	5	1	2	8	6
ZENEBE AYELE WWGC	Water Works Construction	1	16		17	6
WADFTP GENERAL CONTRACTOR	Water Works Construction	8	26	42	76	6
Total of Grade 6					**145**	
Average					**21**	

Grade 1 Private and Public Water Well Drilling Contractors recruitment Plan

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
Brotherhood Water Well Drilling and Construction	Water Well Drilling		8	8	16	1
HYDROCONSTRUCTION & ENGINEERING CO.LTD	Water Well Drilling			3	3	1
ORCHID BUSINESS GROUP PLC	Water Well Drilling	2	8	4	14	1
Saba Engineering	Water Well Drilling	6	6	6	18	1
Amhara Regional State	Water Well Drilling Enterprise (WWDE)	5	12	0	17	1
SNNP Regional State	Water Well Drilling Enterprise (WWDE)	0	0	0	0	1
Afar Regional State	Water Well Drilling Enterprise (WWDE)	0	0	0	0	1
Somali Regional State	Water Well Drilling Enterprise (WWDE)	0	0	0	0	1
Benishangul Gumuz Regional State	Water Well Drilling Enterprise (WWDE)	0	0	0	0	1
Tigray Regional State	Water Well Drilling Enterprise (WWDE)	0	0	0	0	1
Oromia Regional State	Water Well Drilling Enterprise (WWDE)	0	0	0	0	1
Total Technicians					**68**	
Average					**14**	

Grade 3 Private Water Well Drilling Contractors recruitment Plan

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
GLOBAL WATER WELL DRILLING PLC	11. Water Well Drilling	1	2	1	4	3
Mulu Hadgu Construction	11. Water Well Drilling		61	19		3
Qantas water well drilling research plc	11. Water Well Drilling		6	3	9	3
Rebah and Sons PLC	11. Water Well Drilling		4	6	10	3
Tekeze deep water wells drilling plc	11. Water Well Drilling		9	5	14	3
Noh Water well drilling & General Trading	11. Water Well Drilling		9	3	12	3
Total Technicians					**37**	
Average					**7**	

Grade 1 Private and Public Water Works Consulting Companies

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
Oromia Regional State	Water Works Design and Supervision Enterprise (WWDSE)					1
Amhara Regional State	Water Works Design and Supervision Enterprise (WWDSE)	6	1	1	8	1
SNNPR Regional State	Water Works Design and Supervision Enterprise (WWDSE)	2	0	3	5	1
Afar Regional State	Water Works Design and Supervision Enterprise (WWDSE)	0	0	0	0	1
Somali Regional State	Water Works Design and Supervision Enterprise (WWDSE)	8	0	5	13	1
Benishangul Gumuz Regional State	Water Works Design and Supervision Enterprise (WWDSE)	0	0	0	0	1
Federal	Water Works Design and Supervision Enterprise (WWDSE)	23	0	10	33	1
Tigray Regional State	Water Works Design and Supervision Enterprise (WWDSE)	0	0	0	0	1
Total					**59**	
Average					**15**	

Grade 3, 5 & 6 Private Water Works Consulting Companies

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
ABAY ENGINEERING PLC	Water Work Consultancy		4		4	3
METAFERIA CONSULTING ENGINEERING	Water Work Consultancy		1		1	3
Total					**5**	
Average					**3**	
AWE CONSULTANTS PLC	Water Work Consultancy		2		2	5
HYWAS ENGINEERING	Water Work Consultancy		3		3	5
KETEMA CONSULTING ENGINEERS	Water Work Consultancy			2	2	5
TERRACE ENGINEERING PLC	Water Work Consultancy	1	2		3	5
TROPICS CONSULTING ENGINEERS PLC	Water Work Consultancy				0	5
Total					**10**	
Average					**2**	
DEMEWOZ CONSULTANCY	Water Work Consultancy	2			2	6

Grade 3 Private Sanitary Works Construction Companies

Organization Name	Type of organization	Sum of No of Foreman or Chief Technician	Sum of No of Technicians	Sum of No of Assistant Technicians	Total	Grade
MULUGETA ANSHISO WATER WORKS GENERAL CONTRACTOR	Sanitary Works Construction		2		2	3
YITAGESU DINEGDE CONSTRUCTION OF WATER WORKS HOUSE	Sanitary Works Construction		9		9	3
Total Technicians		0	11	0	11	
					6	

Summary of estimated government Institutions Recruitment for technicians & Assistant technicians

Regional Water Bureau Recruitment Plan

Region	Addis Ababa	Afar	Amhara	Benishangule Gumuze	Gambela	Oromia	Somali	SNNPR	Tigray	Hareri	Dired Dawa	Total
Regional Water Bureau	0	1	1	1	1	1	1	1	1	1	0	9
Recruitment Plan	0	2	0	2	2	3	2	2	5	2	0	
Total Recruitment plan	0	2	0	2	2	3	2	2	5	2	0	20

Zone Water Res. Office Recruitment Plan

Region	Addis Ababa	Afar	Amhara	Benishangule Gumuze	Gambela	Oromia	Somali	SNNPR	Tigray	Hareri	Dired Dawa	Total
Zone Water Res. Office	0	0	10	0	3	18	0	14	0	0	0	45
Recruitment Plan*	**0**	**0**	**3**	**0**	**3**	**4**	**0**	**3**	**0**	**0**	**0**	
Total Recruitment plan	**0**	**0**	**30**	**0**	**9**	**72**	**0**	**42**	**0**	**0**	**0**	**153**

Woreda Water Office Recruitment Plan

Region	Addis Ababa	Afar	Amhara	Benishangule Gumuze	Gambela	Oromia	Somali	SNNPR	Tigray	Hareri	Dired Dawa	Total
Woreda Water Office	0	32	129	20	13	265	68	138	34	0	1	700
Recruitment Plan*	**0**	**3**	**5**	**4**	**4**	**4**	**4**	**4**	**5**	**0**	**0**	
Total Recruitment plan	**0**	**96**	**645**	**80**	**52**	**1,060**	**272**	**552**	**170**	**0**	**0**	**2,927**

Town Water Supply Recruitment Plan

Region	Addis Ababa	Afar	Amhara	Benishangule Gumuze	Gambela	Oromia	Somali	SNNPR	Tigray	Hareri	Dired Dawa	Total
Town Water Supply	1	8	155	10	9	142	65	16	59	1	1	467
Recruitment Plan*	**620**	**4**	**5**	**5**	**5**	**6**	**5**	**6**	**5**	**5**	**5**	
Total Recruitment plan	**620**	**32**	**775**	**50**	**45**	**852**	**325**	**96**	**295**	**5**	**5**	**3,100**
Total Recruitment Plan of Government Organizations												**6,200**

*Figure for "Recruitment Plan" is an average number of technicians planned to be recruited in coming 5 years in the respective organizations.
**Figures for Gambella, Hareri, and Dired Dawa are supplied with an average number of technicians in the respective organizations for other regions.

Appendix 5 - Photo Album

KICK OF MEETING AND TRAINING

Photo-1

Photo-2

Photo-3

Photo- 4

Photo-5

Photo-6

ADDIS ABABA/FEDERAL

Photo-1 Federal EWWCE

Photo-2 Addis Ababa WSSA

Photo- 3 Melicon Construction office (private company)

Photo-4 Cosmos Engineering office (private Company)

Photo- 5 Saba Engineering P.L.C. office (private company)

Photo-6 Addis Ababa Federal WWDSE

OROMIYA REGION

Photo-1 Adaa wereda water,mines & energy office

Photo-2 Adama Town WSSA

Photo- 3 Arssi Zone water, mineral and energy office

Photo-4 Tiyo wereda water, mineral & energy office

Photo-5 Lume wereda water, mineral & energy office

Photo-6 Mojo Town WSSA

Photo-7 Bako Town WSSA

Photo- 8 Ambo Town WSSA

Photo-9 Shashemene Town WSSA

Photo-10 NekemeteTown WSSA

Photo-11 MekiTown WSSA

Photo-12 GuderTown WSSA

Photo-13 Gimbi Town WSSA

Photo-14 Sire wereda water, mineral & energy office

Photo-15 Arjo Town WSSA

Photo-16 Jimma Arjo wereda water, mineral & Energy office

Photo-17 Mendi Town WSSA

Photo-18 Menesibu wereda water, mineral & energy office

AMHARA REGION

Photo-1 Debre Birhan WSSA

Photo-2 Debre Birhan WSSA

Photo- 3 Debre Birhan Zone water Resourses Dev't Department

Photo-4 Debre Birhan Woreda water Office

Photo-5 Dessie WSSA

Photo-6 Dessie Woreda water Office

Photo-7 Dessie Zone water Recourses Dev't Department

Photo- 8 Debre Markos WSSA

Photo-9 Gozamin Woreda water Office

Photo-10 Bahir Dar WSSA

Photo-11 Bahir Dar ARWRB

Photo-12 Bahir Dar AWWCE

Photo-13 Bahir Dar AWWDE

Photo-14 Bahir Dar AWWDE's equipment

Photo-15 Bahir Dar AWWDSE

Photo-16 Bahir Dar Private Enterprise

Photo-17 Debre Birhan Private Enterprise

Photo-18 Debre Birhan Private Enterprise

TIGRAY REGION

Photo-1 Adigrat WSSA

Photo-2 Ganta Afeshum Woreda water Office

Photo-3 Wukro WSSA

Photo- 4 Awulalo 2 Woreda water office

Photo-5 Awulalo 2 Woreda water office

Photo-6 Maichew WSSA

Photo-7 Maichew Woreda water office

Photo-8 Maichew WSSA

Photo-9 Raya Alamata Woreda water office

Photo-10 Raya Alamata Woreda water office

Photo-11 Mekele WSSA

Photo-12 Mekele TRWRB

Photo-13 Mekele TWWCE

Photo-14 Mekele TWWCE's equipment

Photo-15 Mekele TWWCE's equipment

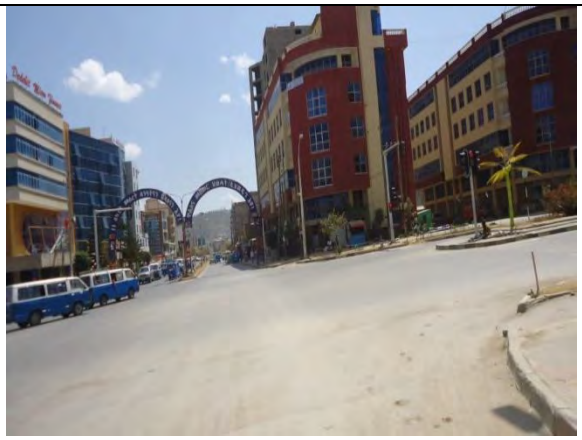

Photo-16 Mekele TWWSDSE

Photo-17 Tigray Private Enterprise

Photo-18 Tigray Private Enterprise

SNNP REGION

Photo-1 Wolkite Town WSSA

Photo-2 Gurage Zone Water Mines and Energy Department at Wolkite Town

Photo-3 SNNP RWB at Hawassa Town

Photo- 4 SNNP WWDSE at Hawassa Town

Photo-5 Abeshege Wereda Water Mines and Energy Office at Wolkite Town

Photo-6 Hosaena Town WSSA

Photo-7 Sidama Zone Water Mines and Energy Department at Hawassa Town

Photo-8 Selti Zone Water,Mines and Energy Department

AFAR REGION

Photo-1 Semera Water Works Construction Enterprise Workshop

Photo-2 Semera-Logia Town WSSA

Photo-3 Awash Fentale wereda Water, Mines and Energy Office

Photo- 4 Awash Sebat kilo Town WSSA

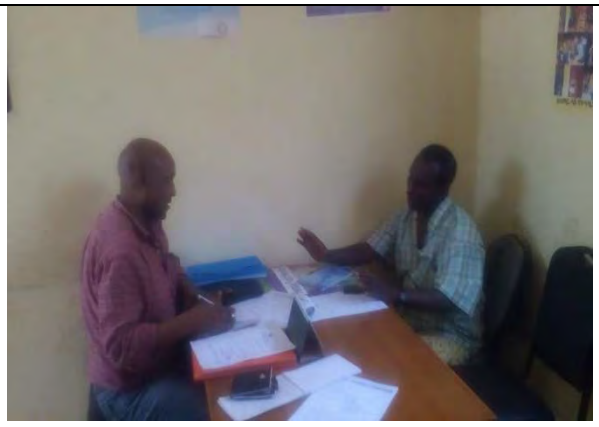

Photo-5 Gewane Town WSSA own

Photo-6 Mille Woreda Water, Mines and Energy Office

BENSHANGUL-GUMUZ REGION

Photo-1 Benshangul-Gumuz WWCE

Photo-2 Benshangul-Gumuz WRB

Photo-3 Bambasi wereda Water, Mines and Energy Office

WORKSHOP

Photo-7

Photo-8

Photo-9

Photo- 10

Photo-11

Photo-12

Appendix 6 – Questioner used for the Labour Demand Survey

Q.N	Question	Response	Instruction
01. Survey Profile			
01_01	Organization ID		
01_02	Survey Date	G.C . / / 2015 E.C. / / 2007	
01_03	Survey Methodology (circle the choice) 1. Direct Interview 2. Telephone Interview 3. Self-administered (E-mail or post mail)		
01_04	Surveyors' name (for direct interview)		
02. Category of the Organization			
02_01	**Region where the organization is operating:_____**		
02_02	To which sector does your organization belong? (circle the choice) 1.Government body 2. Public Enterprises 3. Private Enterprises		
02_03	Type of Organization(circle the choice)	1. Regional Water Bureau 2. Zonal Water Resource Office 3. Woreda Water Office 4. Town Water Supply Service 5. Water Works Construction Enterprise (WWCE) 6. Water Works Design and Supervision Enterprise (WWDSE) 7. Water Well Drilling Enterprise (WWDE) 8. Water Work Construction	

Q.N	Question	Response	Instruction
		9. Water Work Consultancy 10 Sanitary Works Construction 11 Water Well Drilling	
02_04	Photo (If the picture is available)		
03.Respondent's personal information (main person in charge, if more than one responded)			
03_01	Name		
03_02	Position (In the organization)		
03-03	Contact Telephone		
03-04	E-Mail		
04. Organizational Profile			
04_01	Name of the organization		
04-02	Address	Zone_____ Woreda _____	
04-03	Phone		
04-04	Fax		
04-05	E-Mail		
04_06	Website (http://...)		
04-07	Year of Establishment	GC _____ EC_____	

Q.N	Question	Response	Instruction
04-08	How much annual budget (for government bodies) / annual sales (for public and private enterprises) did you have in the latest 1 year?	Birr _____	
04-09	Is your company international? (circle the response)	1) Yes 0) No	==> if No ,skip to Q No. 5
04-10	If Yes What is its Nationality?	_____	
05. Number of Employees by Category			
05-01	How many employees in each of the following category are there in this organization? (Put the Number in the box)	No. of Managers/Supervisors ☐	
05-02		No. Technical Employees ☐	Technical Employees includes: Engineer, Eng. Aids, Technicians, Assistant Techn.
05-03		No. of Admin. & Finance Employees ☐	
05-04		No. of Support Employees ☐	
05-05		Total ☐	
06. Number of Technical Employee by Professional Category			
06 - 01	Within the technical employee, how many engineers, technicians and assistant technicians are there in total? (Put the Number in the box)	No. of Engineer/Technical professional ☐	
06 - 02		No. of Technician ☐	
06 - 03		No. of Assistant Technicians ☐	

Q. N.	Question and Reponses								Instruction
07. Profile of Technician and Assistant Technician									
07	Job type (Single choice for each) 1. Hydrology Technician 2. Mechanic / Drilling Mach. maintenance Technician 3. Surveyor 4. Draft person/CAD operator 5. Driller 6. Electrician 7. Water laboratory Technician 8. Soil Laboratory technician 9. Welder 10. Plumber 11. Bar bender 12. Painter 13. Carpenter 14 Mason 15. Heavy Equipment operator 16. Other _____	Level (Single choice for each) 1. Manager or Equivalent 2. Supervisor or Equivalent 3. Forman or Equivalent 4. Technician 5. Assistant Technician	Age	Sex (Single choice) 1. Male 0. Female	Educational Back ground (Single choice for each) 1. Advanced Diploma or TVET Level IV 2. Diploma or TVET Level III 3. Certificate or TVET Level I-II 4. Other	Year of Experience in the occupation	Type of Employment (Single choice for each) 1. Permanent Employee 2. Contract Employee 3. Other _____	Monthly Salary (in Birr)	Use other sheet for the more obtained profile

Q. N.	Question and Reponses			Instruction
08. Challenges for the Technician and Assistant Technician				
08	What are the common challenges do the technician and assistant technician face in this organization? Indicate the three major ones.	1. Lower Salary 2. Work Environment (Health and Safety 3. Long Working hours 4. Shortage of Technical Knowledge 5. Shortage of Technical Skill 6. Shortage of Equipment 7. Lack of Skill-upgrading/Refresher training **8.** Others (specify:) _____		Circle the choice
09 Employment problems of the technical employees				
09-01	What challenges in recruiting technical employees is your organization facing?	No applicants found in the area?	1. Yes 0. No	Single choice
		High competition in labor market of the industry	1. Yes 0. No	Single choice
		Applicants have no appropriate knowledge/skill?	1. Yes 0. No	Single choice
		Higher salary/benefits demanded	1. Yes 0. No	Single choice
09-02	What challenges related to labor force is your	High turnover	1. Yes 0. No	Single choice

Q. N.	Question and Reponses		Instruction
	organization facing?	Lay off due to budget cut (government offices) / sales reduction (public/private enterprises) 1. Yes 0. No	Single choice
		Lay off due to technology advancement 1. Yes 0. No	Single choice
		Other (specify:) _____	

10 In-service Training

10.01	Has there been any training given to technical employees during the recent 3 years? (circle the choice)	1. Yes 0. No	Single choice If No, skip to Q. 11

10-02 Title of the in -service Training given in the last 3 years? (Write the response in same column below)	10-03 Choose the Target of in-service Training corresponding to the title provided under 10-02 from the choices below 1. Engineer/ Technical Professional 2. Forman or Chief Technician 3.Technician 4. Assistant Technician 5. Other	10-04 Total number of participants	10-05 Training Provider 1. University (Government/Private) 2.TVET college(Governmental/Private) 3. NGO 4. Public/Governmental institution (other than "University" and TVET college") 5. Private institution (other than "University" or "TVET College") 6. Other	Use other sheet for more data that will be obtained.

Q. N.	Question and Reponses				Instruction
11 Cooperative Training					
11-01	How many TVET students in total has your organization accepted for cooperative training for the recent 3 years?	1. None 2. 1-5 3. 6-10 **4.** More than 10			Single Choice If none, skip to Q. No. 12
11-02	Is there any of the following problem happened in your cooperative training?	1. Lack of expected knowledge 2. Lack of expected skill 3. Lack of seriousness 4. Bad behavior 5. Damage of facilities/equipment 6. No problem 7. Other _____			Circle the most common 3 problems
12. Business projection					
12-01	What plans for the future projects does your organization have for coming 5 years?	_____ _____ _____ _____ _____			
12-02	How much budget (for the government offices) or sales/ turnover (for the public/private enterprises) trend is your organization expecting for coming 5 years? (Circle the choice)	1. + 5.0% or more growth 2. up to +5.0% growth 3. Nearly Same 4. would decrease to -5.0% 5. 5.0% or further decrease			Single Choice
12.-03	What training plan would this	Target of the training (circle the	Approximate number of	Area/subject of training (specify)	

Q. N.	Question and Reponses			Instruction
	organization like to have for the coming 5 years?	required below)	participants	If there is more subject of training use other sheet.
		1. Engineer/Technical professional		1. _____ 2. _____ 3._____
		2. Foreman or Chief Technician		1. _____ 2. _____ 3._____
		3. Technician		1. _____ 2. _____ 3._____
		4. Assistant Technician		**1.** _____ **2.** _____ **3.**_____
		5. Other (specify)_____		**1.** _____ **2.** _____ **3.**_____
13 Expected service of EWTI				
13	What service other than training of technical employees would you expect from EWTI? (circle the choice for each response)	Training of Trainers	01. Yes 0. No	Single choice
		Technology transfer	01. Yes 0. No	Single choice
		Laboratory service	01. Yes 0. No	Single choice
		Technical support	01. Yes 0. No	Single choice
		Consultancy service	01. Yes 0. No	Single choice
		Any other (specify:) _____		

Q. N	Question	Response				Instruction
14. Recruitment plan for the technical employees for the next five years						
14-01	How many engineer/technical professional is this organization planning to recruit?	Job type			Number to be recruited	Circle the job type and specify the number of employees to be recruited
		1. Hydro-Geologist				
		2. Geophysicist				
		3. Water quality specialist				
		4. Drilling Engineer				
		5. Mechanical Engineer/Drilling Machinery Maintenance Engineer				
		6. Electrical Engineer				
		7. Water Supply/Sanitary Engineer				
		8.Civil Structural Engineer				
		9. Hydraulic Engineer				
		10. Irrigation Engineer				
		11. Topographic Surveyor				
		12. Other Specify: _____				
14.02	How many		Number to be recruited	Number to be Recruited	Number to be recruited	

Q. N	**Question**	**Response**				Instruction
	technicians/assistant technicians is this organization planning to recruit?	Job Type	for Forman or Chief Technician Level	for Technician Level	for Assistant Technician Level	Circle the job type and specify the number of employees to be recruited
		1. Hydrology Technician				
		2. Mechanic / Drilling Machinery maintenance Technician				
		3. Surveyor				
		4. Draft person/CAD operator				
		5. Driller				
		6. Electrician				
		7. Water laboratory Technician				
		8. Soil Laboratory technician				

Q. N	Question	Response				Instruction
		9. Welder				
		10. Plumber				
		11. Bar bender				
		12. Painter				
		13. Carpenter				
		14 Mason				
		15. Heavy Equipment operator				
		16. Other				
	15 Equipment/ Instruments (software included)					
15	What equipment, instruments, and software does your organization use frequently? If there is a copy of the list, please provide one.					
	16 Respondent's Free Comment					
16	Respondent's Free Comment:- _____					

Q. N	Question	Response	Instruction
	_____ _____ _____ _____ _____ _____		
	17. Surveyor's Observation		
17	Surveyor's observation:- _____ _____ _____ _____ _____ _____ _____		

Thank you for your kind collaboration!!!

Japan International Cooperation Agency

ETHIOPIAN WATER TECHNOLOGY INSTITUTE EWTI

LABOUR MARKET DEMAND SURVEY ON WATER TECHNICIANS IN ETHIOPIA

Appendix 7

RESPONDENTS' FREE COMMENTS

December 2015

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Note:

This document contains the free comments made by the respondents of the Labor Demand Survey. The comments in this document are given as they were written by the respondents, without any change. Therefore, they may contain both grammatical as well as sematic errors.

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7 REGION: ADDIS ABABA	***7.1 SECTOR: PRIVATE ENTERPRISES***
NAME OF ORGANIZATION	**COMMENT**
TROPICS CONSULTING ENGINEERS PLC	We would like to express our appreciation for taking this initiation to fill the gap in the water sector by providing training, technology transfer etc.
KETEMA CONSULTING ENGINEERS	We would like to appreciate for such wonderful questioners for labour market demand survey that can expect to fill knowledge gaps in the future.
GLOBAL WATER WELL DRILLING PLC	We support the survey training service should be strengthen to reduce the skill gape in the water sector.
ATS ENGINEERING	We had very low training plan for our employees but we should plan to have training to our employees in the years ahead.
B.C.GENERAL CONTRACTOR	We appreciate the labour market demand survey that includes the private sector. This would help to plan and implements capacity building activities for the water technicians in this respect upgrading the skill of the technicians shall have great impact to words progressing the economic development of the country.
ABYOTAYKA GENERAL WATER WORKS CONTRACTOR	We appreciate the effort made by EWTI to improve the skill of professionals and technicians through training provision.
TAM GEO ENGINEERING	Undertaking the labour market survey is believed to be helpful to collect all necessary information for various purposes. But at different level to act to reduce the skill gap is very significant for the sector development so as to attend the object of the survey.
KINFEWUBE GENERAL WATER & SIMILAR WORKS	Undertaking such survey gives us pleasure.
AMIBARA GENERAL CONSTRUCTION	Training is one of the important task that enable an organization to upgrade its capacity organization culture learning innovation are the important area of study that enhance the knowledge of the organization employees
GIRMA TAFESSE GENERAL CONTRACTOR & WATER WORKS	To minimizing the challenges seen on the sector .we looking for training of our employees, for facilitate the access for technology transfer, getting equipment, tools & software from EWTI.
MERICON CONSTRUCTION	Though it is nearly 2 decades since our firm is established, full potential of our firm could not be exploited due to the following reasons: 1. Clients favor bidders that offer least prices sometimes at the expense of compromising quality of work, hence we are frequently obliged to experience slack time(no job) that resulted in morale decline and laying off valuable and experienced staff. 2. There are no supporting consulting firms that offer skill upgrading service to help us enhance the technical competence of our staff.

DEMEWOZ CONSULTANCY	This questionnaire more emphasized on drilling related issues. It would be better if it is expanded to other professions like the issue of contract administration and construction supervision.
ERMIAS MERGIA GC & WATER WORKS CONSTRUCTION	There is no water works construction contractor association in our sector so it is my wish if we establish the association together. Thank you and let the all mighty god bless our country through our good work!!!
ZELEK REDI BELACHEW	The training service should focus on practical knowledge.
COSMOS ENGINEERING & COMMERCE PLC	The survey has given the known type of institute to get the services.
ABAY ENGINEERING PLC	The project of private consultancy in the water sector is not attractive this is because of the establishment of government consultancy in most of the region.
REBAH AND SONS PLC	The approach is good, it should be strengthened. EWTI should plan about technology advancement and prepare for that
ALEMU SISAY W.W.G & B.G CONSTRUCTION	The anticipated training should be designed to solve the skill gap at all level who involve in the water sector.
DEREGE DARGIE WWGC	Surveying the demand of the labour in the water sector is appreciable.
AKA CONSTRUCTION	Supporting in capacity building for all water work contractor in Ethiopia may have a significant role in upgrading the sector for current problems like, in machinery, contract administration and project management and other.
MS CONSULTANCY	Some of the questions are too vague to answer or it's out of our organizations scope.
GOJO ENGINEERING	Similar study has been carried out but there is no output for us.
BROTHERHOOD WATER WELL DRILLING AND CONSTRUCTION	Private sectors are not considered by the institute. There is no hope of getting service from the institute.
SABA ENGINEERING	Our problem is lack of training. There is a skill gap. Theory and practical training is a basic process. We need a solution for that.
AWE CONSULTANTS PLC	Our organizational is a private consulting firm where many of the questions do not apply. However, we suggest trainings for the sector should be comprehensive and address all levels of qualifications for capacity building including training and capacity building activities for regulatory bodies as well as consulting firms /personnel. Such trainings may include areas such as issues of professional ethics project management, contract administration, quality control etc.

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KASSAHUN MILLION CONSTRUCTION	Our company is emerging as water works contractor. We have yet to secure projects expand our sphere of management and experience the challenges and rewards of the particular construction industry in particular construction of water works.
SHICON CONSTRUCTION	On job training will make a difference.
HYDROCONSTRUCTION & ENGINEERING CO.LTD	Long term as well short term training for up grading of profession is important. Therefore providing such services in regular base is appreciated for water sector. Specifically, the drillers should be trained to minimize the shortage manpower in their field.
YIFREDEW ABREHAM BUILDING & WATER WORK	Its good start on my side hope it will have great out come in the industry go a head
HYWAS ENGINEERING	It is becoming hard to work as consultant esp. Getting license or renewal of license is cumbersome. Getting license renewal through formal and legal way is difficult.
TERRACE ENGINEERING PLC	In the past three years, our firm has accomplished different kinds of projects in the water consultancy sector. In doing so, we have been focusing to employing freelancers for various seasons, focusing on seasonal employment rather than permanent. I felt this practice has a bit limited our contribution to this survey, and there would be similar practices by others too. This has of course made us not to be challenged with indicated organizational difficulties. It would have probably been beneficial to this survey if some space had been given to such circumstances. It does not necessarily mean that we have had no employment of professional engineers and technicians; but the seasonal nature has forced us to abstain from responding few important questions.
GTB ENGINEERING	If it is possible, giving training for towns and woreda's water utility office man powers.
DEGENA ASSEFA WWC	I would like to appreciate the effort to fulfill the skill gap in the construction sector in all aspects. So the problem in the sector is to find skilled manpower including professional ethics. To this end the training should include such area that would help sector development.
YITAGESU DINEGDE CONSTRUCTION OF WATER WORKS HOUSE	I will need supportive of training and technology transfer from the developed country and help to find the rural area water construction support. Thanks.
BERHE HAGOSE	EWTI should have to give an emphasis to training service that target capacity building of the sector organizational system development technology transfer.

KIBROM GEBREKRSTOS WORROTA	Ethiopia has huge water potential that can contribute significantly to its development. Apart from hydropower, where one can witness some progress development in other water sectors (like irrigation, water supply sewerage.) is far from satisfactory. The cause of this unfortunate fact could be lack of qualified personnel and poor intuitional leadership. Hence organizations like EWTI can help in producing competent engineers and technician along with conducting research and consultancy services to build effective and efficient water resources development institutions.
ASRAT TADESSE WATER WORKS CONTRACTOR	As part of capacity building apart from providing training for technical persons, introducing new technologies would be helpful to increase efficiency and productivity. In upgrading small private enterprises like us capacity building and staff training should be given by your organization in helping then to grow more.
8 **REGION: OROMIA**	*8.1* ***SECTOR: GOVERNMENT BODIES***
NAME OF ORGANIZATION	**COMMENT**
GEBREGURACHA TOWN WSS ENTERPRISE, KUYOU	Your initiative is highly appreciated. We look forward to practical actions to support the water sector as a result of this study.
ADA WATER MINERAL & ENERGY OFFICE	We would like to express thanks for EWTI. We would like EWTI support on training and materials.
FUGNANBIRA TOWN WATER SUPPLY & SEWERAGE AUTHORITY	We work hardly for the people to get pure drinking water & persistent water service at home when we get the pipe & fitting for this matter we finish the unfinished projects.
EJERE WAREDA WATER,MINERAL AND ENERGY OFFICE	We want to come true, practically the questioner that you collect and also we need practical training and support we need material support like GPS, laptop, etc….. We need educational support
EJERE TOWN WATER SUPPLY AND SWEAREGE SERVICE	We want to ask the EWTI to give as training
GOHATSEYON TOWN WATER SUPPLY SERVICE	We want to ask Ethiopian water technology institute to give as training and support in every aspect that we focus in the previous sheets.
AMBO WOREDA WATER MINE & ENERGY OFFICE	We want from this institute short term and long term training, b/c of this office has lack of working instrument like maintenance instrument we want instrument and also we appreciate this institute b/c of asking this question

DENDI WEREDA WATER,MINES AND ENERGY OFFICE	We request EWTI to provide training for our technician to improve the service of water development particularly in the rural areas.
META WOREDA WATER MINES & ENERGY OFFICE	We need the education level to upgrade from diploma to degree, from degree to MSc and soon. Additionally very important training had better adjusted.
SIREWOREDA WATER MINERAL & ENERGY OFFICE	We need technical support, we need chance of education if possible, and we need logistics (e.g. Motor cycle) & other equipment's.
KIMBIBIT WELEDE WATER ,MINES AND ENERGY OFFICE	We need support from Ethiopian water technology on training employees supplying technologies related to water specially material to water quality
WOREDA WATER AND ENERGY OFFICE	We need short term and long term trainings for all technical person and assistant's and also equipment's of technicians.
GEDO TOWN WATER SUPPLY	We need additional training from EWTI
SIRARO TOWN WATER SUPPLY SERVICE ENTERPRISE (AJE)	We highly need of training we need equipment support if possible
SEBETA TOWN WATER SUPPLY AND SEWEREGE ENTERPRISE	We have interested to get the training of EWTI for plumber, technician and mechanics as required
WEREJARSO WEREDA WATER,MINES AND ENERGY OFFIC	We have different water resource potential those not studied before like spring in our Woreda in part some remote from our office and give service for our community.
FITCHE TOWN WATER SUPPLY ENTERPRISE	We earnestly request the EWTI to provide training to our water sector staff.
KERSA WOREDA WATER MINE AND ENERGY OFFICE	We are technical training for technician on year twice.
ARJO TOWN WATER SUPPLY AND SEWERAGE ENTERPRISE	We are really interesting on this questionnaire and we expect from EWTI to do practically beside this questionnaire.
ASELLA TOWN WATER SUPPLY AND SEWERAGE ENTERPRISE	We are kindly confirming your organizational commitment and we are happy to get the chance to be interviewed.so water supply also needs more assistance from your organization technical support and machinery support. We need also continuous training. Thank you for coming to as for interview

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MENDI TOWN WS&S SERVICE	We appreciate the survey of EWTI and please provide us with the necessary training to enable us serve the people more effectively.
GIMBI TOWN WS&S ENTERPRISE	We appreciate the survey and look forward to your training services
MENESIBU WOREDA WM&E OFFICE	We appreciate EWTI providing us capacity building training, instruments of water technology and logistics items like motorcycles and vehicles.
EAST SHEWA ZONE WME OFFICE	Training shall be for all crews (engineer, hydro-geologist, surveyor, plumber, mechanic, geophysics, software modeling equipment like water lab kit, electrometrical kit, GPS, leakage tester, pressure meter, discharge meter,
HARAMAYA WATER, MINE & ENERGY OFFICE	-To building capacity of technology in terms of water experience for workers - to expand non-career ability of water engineering profession in the office
BISHOFTU TOWN WATER SUPPLY SEWERAGE ENTERPRISE	This questionnaire is good for water company change for costing so thank you for all.
BISHOFTU TOWN WATER SUPPLY SEWERAGE ENTERPRISE	This questionnaire is good for water company change for costing so thank you for all.
TEJI TOWN WATER SUPPLY SERVICE	This organization is do very nice for do this plan
SENDAFA BEKE WATER SUPPLY	They need to training
EAST HARARGE WATER MINERAL AND ENERGY	The technicians which graduated from TVET had lack of skills. So if possible those technicians need training. EWTI has continued the skill gap assessment and give a solution to it.
SHASHEMENE WATER SUPPLY & SANITATION ENTERPRISE	The questionnaire is the updated one in my opinion it is good if this EWTI heavily support our organization /enterprise/ thank you!
TULLO WOREDA WATER MINING AND ENERGY OFFICE	The questionnaire that you prepare is good but it didn't include full information fore instance structure of the organization /kinds of jobs/
BURAYOU TOWN WATER SUPPLY AND SEWERAGE ENTERPRISE	The questionnaire was good and timely appropriate. We need technician training and material support to under taken water development activities efficiently to satisfy our customers.
MIKAWA TOWN WATER SUPPLY AND SERVICE	Thank you for EWTI the best for training on job it is better by collecting of data
DIGA WOREDA WM&E OFFICE	Thank you for EWTI brief questionnaire

MODJO WATER SUPPLY SERVICE & SEWERAGE ENTERPRISE	Since water is a limited natural resource, it needs conservation. On the other hand we need to make use of our abundant water resource prudently.
TIYO WM&E OFFICE	Please put into practice the results of this survey we look forward to being served by you.
OLONKOMI TOWN WATER SUPPLY AND SEWEREGE SERVICE	Please give as a chance for training
WUCHALE WOREDA WATER, MINERAL & ENERGY OFFICE	Our request to EWTI is to support our staff on training and laboratory training and others
BECHO WOREDA WATER MINE AND ENERGY OFFICE	Our organization is organization that support many people, instead of this our organization worker or technician wants support of training and update skills, so if your organization support our technician, our technician supports our community better
NEDJO TOWN WATER SUPPLY ENTERPRISE	Our organization does not have any vehicles or car and motor vehicle due to this we have a problem in service delivery.
OROIYA WATER ,MINIRAL AND ENERGY BUREU	Like this assessment it is very good for the future we want need for this organization to train our employee, on ground water investigation. Design & study drilling machine maintenance and so on
GEBREGURACHA WM&E OFFICE	It is good to put into practice the results of this study to resolve most problems in the water sector.
NEKEMTE WATER SUPPLY SERVICE	In our region water sector there is skill gap on all level of technical work specially in leakage detection we are interested to have a training to solve this problem, and also on operation and maintenance, and water supply design and construction of water sources.
DODOLA TOWN WATER SUPPLY ENTERPRISE	In our organization we have lack of technology resources like electro mechanical in switch board installation pump and motor installation and maintenance. Training of plumber technician to reduce
DEBERE LIBANOS WEREDA,MINES AND ENERGY OFFICE	In general this interview helps our Woreda and our country specially for the second development and transformation plan. Additional to this we want support from EWTI.
GETEMA TOWN WATER SUPPLY SERVICE	If take a sustainable training for all technicians to supply office furniture like computer to supply sustainable water supply for a community deep study from this agency
WEST ARSI WATER MINES AND ENERGY OFFICE	If above question is taken under consideration we thanks those who support our office.

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TEKE KUTTAAYEE WOREDA WATER & ENERGY OFFICE	For future planning it's very important for us, special for the 2nd planning
AMBO TOWN WATER SUPPLY AND SEWARAGE ENTERPRISE	For all above mentioned we would wait /expect training on operation for the coming 5 years
BOBILE WATER,MINERAL & ENERGY OFFICE	First, we would like to thanks to come our organization then the questionnaire more of them that describe our staff the present shortage.
SHANO TOWN WATER SUPPLY SERVICE	First of all we would like to express our deep gratitude of EWTI beside to our thanks we need EWTI to support us like logistics, equipment material support and to give us training for our technician and operator
SHALA WORDA WATER,MINERAL AND ENERGY OFFICE	First of all, I would like to thank EWTI for their bringing this kind of questions to our office. We have many problems like logistic, technical tools like modern GPS and technical training for our staff's. if EWTI helps us on this regards we appreciate them and the beneficence is all the community.
ADAMA TOWN WATER SUPPLY AND SEWERAGE SERVICE ENT.	First of all we would like to thanks EWTI to give us such questionnaires. Beside to this we ask EWTI to give us training on the topic such as- rewinding motors, software application on arc GIS, quantum GIS, cad and technology transfer.
DUKAM WATER SUPPLY AND SURVICE	First of all we would like to express our thanks for EWTI and beside to this we want training on motor operator and all technics logistics and budget, deep well drilling and other necessary equipment
TULUBOLO TOWN WATER SUPPLY SERVICE	First of all we thank your organization to ask us our basic problem in our services. Next to that we asks to help us by developing our technicians of finance crews capacity building on their works and by serving us maintenance equipment
ILU DISTRUCTER,MINERAL AND ENERGY OFFICE	First of all I would like to thank you your organization to invite us and especially we would like if your organization give a capacity building for our technician. Other if our organization is supported by logistics and equipment we more interest. Thank you
WATER MINERAL & ENERGY OFFICE	First of all I would have to say thank you for visiting our office and as far as your questionnaire of giving a chance to identify our problem. Please try to change this survey to practical for change.
AKAKI WOREDA WATER MINES AND ENERGY OFFICE	First of all I will thanks to your institute for preparing this questionnaires to solve the problems or challenges concerning to improve employees skill. Next your institute (EWTI) gives different training in different titles and the employees got experience.
SULULTA TOWN WATER SUPPLY SERVICE	First I would like to thanks for your assessment question and it use us for the second transformation plan.

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GIRARJARSO WOREDA WM&E OFFICE, FITCHE	EWTI needs to keep up its efforts to aggressively conduct training which will improve the water sector.
WAYON TUKA WEREDA WATER,MINES AND ENERGY OFFICE	EWTI is not giving training of trainers, so if it improves this scarcity in the future it is better. EWTI to support all necessary equipment office and as well as motor cycle, laptop
BOSET WOREDA WATER,MINS AND ENERGY OFFICE	EWTI is first of all thank you to meet us. Our office is so much problem on budget for our encouragement we need -logistics (car, motor bicycle) training for experts (on maintenance) budget for training , skill up grading d/t tools used for maintenance, for study (tool kit)
N.SHOA WATER MINES AND ENERGY OFFICE (FITCHE)	Ethiopian water technology institute now carried study on water sector to alleviate some problems of the organization. Accordingly our sector have greater problem on training for technician. To fill this gap the water technology institute should
ARSI NEGELA TOWN WATER SUPPLY	Ethiopian water technology institute should provide us training and materials support. This is our critical issue for our water development activities.
LEKA DULECHA WAREDA WATER,MINES AND ENERGY OFFICE	Ethiopia water technology training institute (EWTI)
HIRNA TOWN WATER SUPPLY SERVICE ENTERPRISE	Due to la of knowledge and skill more teaching (upgrade) and short term training are required.
CHALIA WOREDA WM&E OFFICE	Dear EWTI. Please help on the following. - solving the long period headache of our technicians due to lack of chance to upgrade their education. - providing short term training. - providing technological transfer.
WELISO TOWN WATER SUPPLY AND SEWAREGE ENTERPRISE	As a respondent Weliso water supply and sewerage enterprise have many problems. For example shortage of materials such as water leakage detection instrument, laboratory instruments as a whole material support and capacity building
GIMBI WOREDA WM&E OFFICE	Annual plans can be achieved through various training including provision of instruments.

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BESAK WOREDA WATER MINING & ENERGY	All technicians have very good commitment to do any professional duties but never get support capacity building. Due to lack of budget less power of average water supply no coordination (connection) with other external part for or another related organization. So we need support of such related organization
CHELLENKO WATER SUPPLY AND SEWERAGE ENTERPRISE	A regular study of this kind is needed to solve the problem of the water sector. There is lack of skill upgrading and refresher training. The number of professionals in the sector is not as the organization structure needs.
SIBU SORE WOREDA WM&E OFFICE	- We request EWTI to provide training of trainers regularly.
CHIRO TOWN WATER SUPPLY & SEWERAGE SERVICE	- To strengthen the water board committee, experts should be added as member. - maintenance of pumps is done without adequate electromechanical knowledge
NEJO WM&E OFFICE	- The questionnaire offered is good if and only if its answer or reflection applied in the future. - as EWTI why different technologies of water supply is not applied - why not skill upgrading for water supply technicians are not given
KOMBOLCHA WATER, MINING & ENERGY	- Most surveys and research are not organized properly and mostly are not focused on the output. - There is a great gap on training of technicians. It is good to work on skill upgrading on motor pump and electric operation.
SHASHEMENE WOREDA WM&E OFFICE	- I hope this study should be implemented up to Woreda level -JICA should support and strongly work on capacity building work for water technicians - technological transferring work must be implemented soon
DODOTA WME OFFICE	- Dodota water management office is short of trained staff and office equipment and logistic facilities. We will be pleased if EWTI can support us in facilities and equipment.
REGION: OROMIA	*8.2* ***SECTOR: PUBLIC ENTERPRISES***
NAME OF ORGANIZATION	**COMMENT**
OWWDSE	The questionnaires are standard and have given to us some clue where we shall focus in the future on the water sector. In addition, it identifies water sector problems and gives guidable recommendations.

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OROMIYA WATER WELL DRILLING ENTERPRISE	First of all we would like to express our deep gratitude for Ethiopian water well drilling institute. Beside to this we need JICA to train for us Ground Water Management, aquifer, GIS, arc GIS, drilling technology, basic maintenance of compressors, machinery electrical maintenance, global mapper, surfer electricity, welding.
OROMIYA WATER WORKS CONSTRUCTION ENTERPRISE	As I observed from interview to increase the number of technician on market and to increase human resource on water technology is very urgent issue in Ethiopia. I am happy or I wish it the above questionaries' is applied properly.
REGION: OROMIA	*8.3* ***SECTOR: PRIVATE***
NAME OF ORGANIZATION	**COMMENT**
TEGEGN ALEMAYEHU WATER SUPPLY AND SEWARGE CONSU.	We highly appreciate the demand survey to full fill the technical gap observed in almost all water service with in the country with resulted increase of documentation and data for future planning and design of water supply, sewerage and drainage project.
LEMMA EDEA G.C AND WWCC	We are kindly expecting good training service to upgrade our company in technical and modern working system.
ANSIF CONSTRUCTION	Our company established on2007gc with capital one million and with grade six contractor. On year 2015are our company upgrade to GC-one grade and right now. We are working on real construction works and our company capital with 100000 birr.
HABTE NEGASA WWGC	Most of the time research conducted by government institute takes long time to come in to implementation even after the condition during questionnaire are called changed so we hope from you that you will bring this to the ground to change the present condition soon after it gradually changed by itself after long time the institution should also select competitive contractors and make ready them for further advancement thank you for your willing to work with us.
GUTEMA FIRISA CONSTRUCTION	Due to high competition in these areas our company has no project on water work construction yet. So most of the questionnaires are for those active company's.

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9 **REGION: AMHARA**	*9.1* ***SECTOR: GOVERNMENT BODIES***		
NAME OF ORGANIZATION	**COMMENT**		
DANGILA TOWN WATER SUPPLY SEWERAGE & SERVICE OFF	Your questionnaire is not including other departments, admin & finance employee. These employees do not upgrade their profession due to budgets and does not participate like other governmental organizations.		
F/SELAM WATER SUPPLY SERVICE	Your institution very interesting so please tries to achieve the goal. Our problem is very big, especially in the lower level therefore try to solve by capacity building.		
WOLDIYA WATER SUPPLY AND SEWARAGE SERVICE	We need to train finance, inventory double entry system purchase, and HRM.		
SOUTH GONDER WATER RESOURCE DEVELOPMENT DEP.	We expect more from EWTI in relation with upgrading knowledge & skills of technical staffs, transforming technologies and rendering research services for the water sector.		
BURE WATER SUPPLY	Water supply system used a knowledge man power. But now a time most water supply office have no a talented or specialist in persons in there office so technical training are use full to facilitate good water sanitation program.		
WOREDA WATER OFFICE	Upgrade the water technical skill is necessary to facility the countries development so the plan must be performed on the time.		
DESSIE ZURIA WOREDA WATER AND ENERGY OFFICE	This types of questionnaire is not given you a full information b/c of this you must do a direct interview to the respondent's in order to gain a full information that you want the organization employees need further training of softer application of water sector.		
TARMABER WATER OFFICE	This program is very nice b/c & fill far the need for the 2nd GTP in this governance to create water technicians and man power in this kind of subject and to get the skill so for to be regards with our office.		
AMBASEL WOREDA RESOURCE OFFICE	This is the ability to plan and coordinate this training, accept responsibility and accomplish these duties with at most care and interest. I therefore, strongly feel that there will be able to successfully undertake and timely complete any advanced training and professional work related to their field of study.		
AWIZONE WATER RESOURSE DEPARTEMENT	This and like things are nice for the institution development but must be done at a short time.		

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EFFESON TOWN WATER SUPPLY & SEWERAGE SRVICE	These is an appreciated idea if the institute EWTI start some of training that collected by the data and more shortage skilled & knowledge depend on the result, for the next five years 2nd GTP almost at Woreda level our country have at list one profession with every types of job.
TILILI WATER SUPPLY AND SEWARAGE SYSTEM	The EWTI is establishing at the right time for the right purpose!!! First of all I would like to tanks the house of ministers to establish the EWTI in legally front in order to search finding assessing the problem that the water sector focal and taking institution and responsibility to solve the problem. As well as to improve the labour force for improving the performance of the water sector the next tanks is given to the EWTI that show will in guess to search the main challenges in the water sector & give mitigation to the operating problem the Ethiopia town water supply and sewage employees are almost none trained personal except few job position they work & operate heavy machines by experience gained from their relative.
GOYAMEN WERED WATER OFFICE	The training support should be at Woreda level
NORTH WOLLO ZONE WATER RESOURCE	The training required should be more practical so as to fill the gap in technical skill and knowledge. The training should be including planning socio economic data analysis and water quality analysis.
SOUTH WOLLO ZONE WATER RESOURCE DEPARTEMENT	The training program for mid-level technician is necessary for our origin.
ANRS WATER RESOURCE DEV'T BUREAU	The questionnaire was want it may short & precise.
FAGITALEKOMA WATER & RESOURCE OFFICE	The questionnaire above lists is good & it fills the gape b/n employees & the work so this study hopefully fulfills such types of technical gaps and technical skills. But the study mainly focus on technical employees only why? Is there employee un wanted? E.g. supportive employee and other one not engaged in any training.
WATER RESOURCE & DEVELOPMENT OFFICE	The need assessment of your project is very interesting questionnaire so far our development the project should give attention for the employee's to training technical knowledge & skill as well as professional up grading.
DEBRE MARKOS WATER SUPPLY & SEWERAGE SERVICE	The future training also includes renewable energy & management system.
BURIE ZERIA WATER & ENERGY OFFICE	The EWTI will be to absolve the Woreda areas to capable the ability of technicians for the future the country developing places than the people will want pure water to do this of the technology.

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KEWOT WEREDA WATER RESOURCE OFFICE	The EWTI distributes this questionnaire to lower sectorial office is good to motivate employment activities. I would like to give an assumption, if the EWTI give a chance to scale upgrading, it will better to transfer other GTP.
DTWSS.OFFICE	The above questionnaire listed by the labour market demand survey is good for my organization. So we need human resource training support different equipment & database management in order to fulfill the organization in capacity building and also give good service for our customer & provide good governance therefore they give appropriate support in all needs for our organization.
GUBALAFTO WEREDA WATER RESOURCE DEVELOPMENT	Such type of interview for demand is collected so many times but we didn't gain the chance to train.
MACHAKEL WOREDA WATER OFFICE	Please continue do not forget this long and short term training course.
LIBOKEMKEM WOREDA WATER OFFICE	Our Woreda water resource office unit and there is no to keep energy salary monthly come very poor. B/c Woreda professional different from other center in Ethiopia ex healthy, agriculture than to immigration other center.
DEBRESINA TOWN WATER SUPPLY SERVICE	Our company does not developed by finance of asset, so most of training of will be give free payment. Although the institution formed newly at a short time we will have to expect to build capacity of human resource of water sector to achieve 2nd GTP.
AMBER TOWN WATER SUPPLY & SEWARAGE SERVICE OFFICE	Our organization currently status to give for provide questionnaire to support our tasks. EWTI technician training, software bill system pumps installation, control board installation, and customer management.
DESSIE TOWN WATER SUPPLY & SEWERAGE OFFICE	Organization wants technical training for technicians and your organization help to us. Generally this action research has given for good chances.
KOMBOLCHA TOWN WATER SUPPLY & SEWERAGE OFFICE	My comment for your organization is that our organization is located at the area where industries are more expansion so that more of our workers need training 10 different training methods. So we need your help and participate general thanks.
INJIBARA TOWN WATER SUPPLY SERVICE	Most of the utilities employees are new for the job not only technical department it is also financial, customer service, auditing, plan and program and administrative have shortage of technical knowledge and skill gap so the utility wants training in short period of time in order to running systems GTP program.

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BANEJA WORED WATER OFFICE	Lack of knowledge or skill. Lack of educational or upgrade training. Lack of equipment facility. Lack of personal salary. Lack of software training. Lack of technical training then if you this project gives for training will be to 5 years for the result success full knowledge and skill for all staff members.
MECHA WOREDA WATER OFFICE	In our organization so many problem will occur in technician skills of the employees so your institution are will solve this problems by given a great emphasis we will expect we say but by giving long term training for employees in different department activities of our organization need.
WOREDA WATER RESOURCE DEV.	In my opinion I have to use technical experience and try maintaining the nonfunctional water point. I try to select the geological area to construct the well studies water point.
FARTA WOREDA WATER RESOURCE OFFICE	If your organization can give any training you will give us a training about electrical machine for pump attendant & electrician and also give a training for surveyor and water electrician about site selection and construction supervision.
BASONA WORANA WEREDA WATER OFFICE	I would like to recommend that EWTI has a good approach. Since knowledge of skills are basement of solution so that this type of approach should be provide continuously.
BICHENA TOWN WATER SUPPLY &SEWRAGE AUTHORITY	I want to comment you to give training for the utilities since we have lack of technical & financial management system.
DEMBECH TOWN WATER SUPPLY SERVICE OFFICE	From government or NGOs to give for the town water supply service office. To give technician support to give material & technological support to give training support to give consultancy service to give transport support
LUMAME TOWN WATER SERVICE	For the next five years we want GIS software so you should be support us. As our staff there no training technical & managerial so you should be support.
E/G/W/WATER RESOURCE & DEVELOPMENT OFFICE	EWTI to support our office by training of trainers. Technology transfer. Technician support.

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BAHIRDAR TOWN WATER SUPPLY SEWERAGE SERVICE	EWTI should advance their training methodology and will include advanced software and training. It should also include electromechanical equipment installation in the training. For water supply study and design training practical training will be include. The training should include the methods or techniques how to reduce non-revenue water or water leakage.
NORTH SHEWA WATER RESOURCE DEVELOPMENT DEP.	EWTI not known by this zone. When EWTI design a plan please contact us. The Future training give in a program way.
GONDER WATER SUPPLY AND SEWERAGE SERVICE	EWTI mainly focus on geologist and drilling technicians, it lacks training for engineers and technicians to mentions some, pipeline network design, water treatment plant operators, plumbing, surveying, water meter maintenance, water pumps installation and maintenance electromechanical and water supply design etc. Please give attention and in service training of engineers & technicians.
DEBARK TOWN WATER SUPPLY & SWERAGE SERVICE	As I have tried to explain on this questionnaire our organization has many problems, especially on modern technologies software and budget. Moreover we have much occupational and administration burden.
KEMISE ZONE WATER RESOURCE DEVT DEPARTEMENT	Appreciate EWTI for the future training it is a good thing keep gone. EWTI training also focuses on the area of green energy innovation.
DEBRE BIRHANE TOWN WATER SUPPLY & SEWRAGE AUT.	Appreciation for EWTI for the training of technicians. This survey must be applicable & start the training with in short period of time.
DEWA CHEFA WEREDA	All in all rise questioners is very good for the future it is best it training is taken for all professional officers.
KEMISIE WATER SUPPLY SERVICE	Advice any change that hindered our operation. Thank you for asking our problem.
WATER RESOURCE AND DEVELOPMENT OFFICE	Above I should like to pick special thanks to EWTI for providing questionnaire to support our task and then we would like to express heart full thanks to treat the office but I put some important points or consideration remember the next time. 1. Technician training mandatory for technicians and assistance technician specially TVET level employees 2. Fulfillment of equipment instrument also moderately. 3. Software like cad, GIS is available to simplify our work.

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REGION: AMHARA	***9.2 SECTOR: PUBLIC ENTERPRISES***		
NAME OF ORGANIZATION	**COMMENT**		
AMHARA WATER WELL DRILLING ENTERPRICE	We have been looking for such an organization which is working in line with our organization special type of behavior the main concern of our organization is the work force development so as to accomplish the mission of our organization with technological advance knowledge and skill manpower.		
WATER WORKS DESIGN & SUPERVSION INTERPRISE	The questionnaire was too many it may short & precise.		
REGION: AMHARA	***9.3 SECTOR: PRIVATE ENTERPRISES***		
ZENEBE AYELE WWGC	The government for the coming five year must plan to support private contracts in terms of:- training in contract administration etc. Financial loan. Construction equipment supply for long period payment system with government.		
SOLOMON KASSA WC & GC	The future training EWTI gives is better in summer without interference with working hours		
DEJEN ASMARE WATER WORK CONSTRUCTION CONNTRACTOR	Thanks the water technology institute having for referring a chance of having questioned an important thing for our organization and for our country development as well. Finally many thanks to engineer Engidashet Bunare for his patient during survey or time.		
MASTEWAL DESALEGN WATER WORKS GENERAL CONTRACTOR	It is important to upgrade our organization by preparing short term training mentioned above with similar organization.		
KIBRAN GENERAL CONSTRUCTION	I admire to EWTI to include a private sector this training may include a short term training and technical support in private sector EWTI takes a questionnaire training service.		
10 REGION: TIGRAY	**10.1 SECTOR: GOVERNMENT BODIES**		
NAME OF ORGANIZATION	**COMMENT**		
ENDABAGUNA TOWN WATER SUPPLY OFFICE	We say that thank you for EWTI for their thinking to providing training for the organization of any water related office.		

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ADIGRAT WATER SUPPLY	We have a problem with knowledge and skill of electricians and operators. They need support like the previous training, pump testing, installation problem. Lack of crane to install pump. Rehabilitation problems.
WATER SUPPLY OFFICE ENTICHO TOWN	We are too much happy and lucky to be your member of the institute and also we hope that this relation would help us to our office.
GANTA AFESHUM WATER RESOURCE MINES & ENERGY	We are short of skilled staff and equipment.
AXUM WATER SUPPLY AND SEWERAGE OFFICE	Training on electro mechanical is mandatory in addition to that more advanced water technology shall be provide for the utilities
SHIRE TOWN WATER SUPPLY OFFICE	Training given to water supply employee should focus on practical area rather than more of knowledge based training manuals should be prepared based on bench marking tools so that every employee can learn from the other.
WOREDA WATER RESOURCE OFFICE	Top map have to full field for geologist and the same is true for geological/hydro-geologic software and computer have to be allowed. -software's for engineers, watershed experts like that (HEC HMS) and ARCGIS software
ENDERTA WM&E OFFICE	This questionnaire is very important to alleviate the shortage of skilled manpower and to provide different equipment to facilitate the different activities of the organization in short period of time.
WATER RESOURCE MINES AND ENERGY OFFICE	The questionnaire is not obvious, it is some complicated. The questionnaire skeleton is formed by the federal structure; it is not suitable for Woreda level. We don't know what the EWTI works obviously. This is because of previous miss contact.
AHFEROM WEREDA WATER OFFICE	The questionnaire is good guidelines for our organization (office) because it indicates all what we have gapes. If it is possible, any organization can give an additional skill up trainings and sharing experiences. It is also prepared based on the future GTP 2.
ENDABAGUNA WM&E OFFICE	Thank you for EWTI for thinking to supply their services to the water sector.
ALAMATA TOWN WATER SUPPLY SERVICES	Our organization highly needs technical support specially technologies which are support for controlling water loss. In addition training on human capital is very important. The previous five years our organization did not get any training.
WATER RESOURCE MINE & ENERGY	Our organization is planned big quantitatively and qualitatively for the second GTP. Therefore to meet the goals of this GTP we need technical support and equipment that are needed to help our expert to do their activities. Training is important.

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KOREM TOWN WATER SUPPLY SERVICE OFFICE	On behalf of my organization and myself, i would rather fill this questionnaire since I got to know this organization back during my early years here so that we could have solved the problems that we used to face. However, I am happy that I filled it now and urge on the practicality of to be worked on by the provider of the questionnaire.
ADWA WATER SUPPLY & SEWERAGE SERVICE	It is good opportunity for our office but for next better to include for all staff members like administration finance supporting employees planning & budgeting
ADWA WATER RESOURCE MINING & ENERGY	If your college open in our city it profitable
WEREDA TSELEMTI ATER MINE AND ENERGY OFFICE	I would like to say the training should be given on time to fulfill gaps and short comes. It should be subject based.
MAICHEW TOWN WATER SUPPLY SERVICE	I am happy on behalf of my office hearing capacity building, knowledge transfer and equipping from EWTI and we are looking forward for these welcome / interesting training as well. See you then.
LAELEY MAYCHEW WATER RESOURCE OFFICE	First thank you to Ethiopian water technology institute (EWTI) for you prepared this questionnaire paper. But for other time we expected (our office expected) from Ethiopian water technology institute (EWTI) to full fill in the training skill and knowledge in technology transfer on time. Generally our office (Lailay Maichew water resource and mine office) needs training in different departments and supervisions on time and also if your organized have capacity we need for that all you help our Woreda thanks!
ENDAMOHONI WOREDA WM&E OFFICE	At this Woreda at work through so many problems we need training about software and engineering, instruments for field study, skill upgrading.
TOWN WATER SUPPLY SERVICE	As generally this organization has there is no enough budget w/n we repair with other organization that means this organization was very important and very mandatory in order to like all things with life but w/n this there in no enough budget skilled man skill employee and other machineries
REGION: TIGRAY	***10.2*** **SECTOR: PUBLIC ENTERPRISES**
NAME OF ORGANIZATION	**COMMENT**
TIGRAY WATER WORKS ENTERPRISE CONSTRUCTION	The questions are vast that needs more time to fill and different persons with different fields to fill. It is better to upgrade the operators & mechanics (electromechanical engineers). Refreshment courses & diploma level training with drilling engineers & mechanical engineers will have a great contribution for our enterprise and the region and may be for the country.

REGION: TIGRAY	*10.3* ***SECTOR: PRIVATE ENTERPRISES***		
NAME OF ORGANIZATION	**COMMENT**		
TEKEZE DEEP WATER WELLS DRILLING PLC	Training on drilling operators, mechanics and technicians is not available throughout the country so it is important if you start the training immediately.		
NOH WATER WELL DRILLING & GENERAL TRADING	This training plan include in all section like private and also given in all region		
HATLAY ARGAWI WATER WORK CONTRACTOR	The training needs to be conducted closer to us. The training schedule should be availed to us.		
G.G.H WATER WORKS CONSULTING	The future training is basic for the country. The training also include all region and the private sector.		
ARAD WATER WORK CONSTRUCTION PLC	The future training also include private sector & the training may be focused on: -Forman-construction management-hydrological and geological map-drilling technology		
HAFTOM ABRAHA G/W/W R.R.C	Our organization is very glad to fill this questionnaire we are expecting you to upgrade our workers skill and to make our organization push forward in different aspects.		
LILAY WELDU WWC &GC	Our organization is always ready to cooperate with your institute in consecutive training and technology transfer		
RIVAN CON ENGINEERING PLC	In the water area yet we have to do a lot, there is a gap starting from privilege (duty free machineries) and upgrading training which is the professionals already on a work. So we expect EWTI to fill this gap having an instruction also very helpful for the country.		
G/ANANIN MEHARI WATER WORK CONTRACTOR	I wish this training was conducted before the launch of COC (certificate of competence) program. The training will enable us secure COC.		
QANTAS WATER WELL DRILLING RESEARCH PLC	- Appreciation for EWTI to include the private sector. This training also given by payment to all sector. - The given training includes short and long term. The short term training given in summer.		

11 **REGION: SNNPR**	*11.1* ***SECTOR: GOVERNMENT BODIES***		
NAME OF ORGANIZATION	**COMMENT**		
DOYOGENA TOWN WATER SERVICE	When the ongoing project is finished our people problem is totally solved here in this town water is crucial problem then we need support from NGO and various investor. We are thank you as whole, you recognize the medium level technician problem on maintenance and how to operate the control panel.		
WERABI TOWN WATER SERVICE OFFICE	We thanks to EWTI, from now on we want upgrade ourselves on new technology like to know where is happen and to know the capacity of water in reservoir and how many delivers and how many water development in general new technology on controlling bill reader		
ALETA CHUKO WOREDA WATER MINE AND ENERGY OFFICE	We request follow-up and support on technical and financial, thank you your survey		
WONDO GENETE TOWN WATER SUPPLY SERVICE ORGANIZATIO	We need to use computerized bill & also use new technology on controlling the water meter.		
SHONE TOWN WATER SUPPLY SERVICE	We need support on capacity building and material purchasing.		
HUMBO WOREDA WATER MINES AND ENERGY OFFICE	We need support to construct water scheme of distant Woreda		
SHEBEDINO WOREDA WATER MINES AND ENERGY OFFICE	We hope to get a result from this labour demand survey. Thank you.		
LEMO WOREDA WATER MINES AND ENERGY OFFICE	We are very happy to bring this study for own technician to capacitate. Our budget is small (not enough) to construct the water well therefore this study is a good opportunity for us to build the capacity of the technician.		
SSHINSHICHO TOWN WATER SERVICE	To increase our market, we work hard to update our relationship from NGO and the sector office.		
BUTAJIRA TOWN WATER SUPPLY SERVICE ENTERPRISE	This survey has a good start to fill a gap in our organization and after we hope fully seen the end result upgrade the capacity of higher official support on material and money. All this are important i believe that this institute is very useful for our organization.		
CHEAHA WOREDA WATER MINE AND ENERGY	This research questionnaire is essential to give solutions which are fare water mile and energy sector if it is applicable the finding.		

HULBAREG WOREDA WATER MINE ENERGY	These to asses of the labor market demand for water technician is good plan but the institute can inter exactly training and to the solution.
WONAGO TOWN WATER SUPPLY ENTERPRISE	There is no enough office furniture, and we want also support our enterprise with necessary equipment for water works. Please, support us!
ARBAMINCH ZURIA WOREDA WATER AND MINNING ENERGY	There is lack of transportation in order to maintain
DORAME TOWN WATER SERVICE OFFICE	The water project was constructed but we get power only for 6hr therefore we couldn't meet the pupils interest. We couldn't get any training b/c they think that the water service have their income therefore they can do by themselves.
SANKURA WOREDA WM & E OFFICE	The questionnaire for labor market demand survey is very important because to develop our organization based on human resource professional skill, availability of the equipment to remove our challenge according to the questionnaire.
ARBA MINCH TOWN WATER SUPPLY AND SEWERAGE ENTERPRI	The codes difficult to fill the questions are too many Q.07. Needs all the employee should registering one by one un necessary repetition of questions
SILTIE ZONE WATER MINE AND ENERGY DEPARTMENT	Support on capacity especially on soft ware's design and EMT.
WONAGO WEREDA WME OFFICE	Shortage of logistic spatially motorcycles and cars and allowance
WELKITE TOWN WATER SUPPLY & SEWERAGE ENTERPRISE	Questionnaires and surveying is good studies for future plan to achieve the organization goal
HADIYA ZONE WATER MINES & ENERGY DEPARTMENT	Much of questions raised are open- ended and stretched per our organization discipline demands.
KEDIDAGAMELA WOREDA WATER MINE AND ENERGY OFFICE	Many NGO build the water scheme but they are not follow up on maintenance because our capacity is limited and less capacity to know the problem how to maintain.
HADERO WOREDA WATER AND MINNING ENERGY OFFICE	It is better if focused on problem and high frequent.

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DOYOGENA WOREDA WATER MINE AND ENERGY OFFICE	It is a good side to follow up on water resource technician problem on operation and maintenance. - Technical equipment is our crucial problem. - We learned many things about handling the HR data from this questionnaire. - We hopefully expect a result. Thank you!
DALOCHA WOREDA WATER, MINE & ENERGY OFFICE	In zonal level there must be water laboratory - software's like water cad, EPANET, storm cad, server cad etc., - there must be short term software trainings and related other training - on job training in water related work - staff up grading from lower to higher should be given.
GURAGE ZONE WATER MINING OFFICE	I have seen the good thing from your study helping to fill gap and enhancing GTP ii
DITA TOWN WATER SUPPLY AND SERVICE	I appreciate that government give attention to training for medium level technician.
GUMERA WOREDA WATER MINERAL & ENERGY OFFICE	I appreciate that Ethiopian water training institute for your preparation of this type of questionnaire because using by this data the EWTI can assess the labour market demand for water technicians who would be the potential trainees of the training
BOLOSO SOPE WOREDA WATER AND MINNING ENERGY OFFICE	Government does not give an emphasis for the water sector NGO's also not give an opportunity for Woredas mostly their enhancement is far regional and zonal most facilities not given to the Woreda for example there is shortage of transportation.
AREKA TOWN WATER SUPPLY ENTERPRISES	Government does not give an emphasis for the sector. Since we manage our serves by sales and there is no budget from the gov't these leads to high turnover. There is high shortage of human power
KIBET TOWN WATER SUPPLY SERVICES	Giving us a frequent consultancy and technical support will enable us to reach the water supply service to meet the community needs. We our organization /need badly private NGO's working in water delivery service through you.
ANLEMO WOREDA WATER AND MINNING ENERGY OFFICE	First of all I would like to thank the Ethiopian water technology institute by doing this survey. Our technician have no enough technical skill and overcome this problem we expect advanced technical training from you in addition to this all the positions (levels) studied are not appropriate with the salary. All the positions in water sector must better to be studied in new way.
MIRAB ABAYA WOREDA WATER MINES AND ENERGY OFFICE	Collecting of this sector data is good if it is studied and worked on ground. It is not only collection of data but applied on works etc.

MISHA WOREDA WATER AND MINNING ENERGY	As I see in the sector the main challenge is shortage of salary and the research solve the problem we addressed to achieve the GTP2 plan in water sector.
DALOCHA WOMEN WATER DEVELOPMENT ASSTN. /DWWDA	All type of profession for used in the water development association b/c of they are lived in the long time in their work and they volunteers and semi volunteers in their payments and services. Their experience is from 10 year to 18 years in the association as permanent staff (including admin & finance staff)
WONDOGENET WOREDA WATER MINE AND ENERGY OFFICE	- The questionnaires if there is to solve organization problem, within technician.
REGION: SNNPR	***11.2 SECTOR: PUBLIC ENTERPRISES***
NAME OF ORGANIZATION	**COMMENT**
SOUTH DESIGN CONSTRUCTION SUPERVISION ENTERPRISE	The institution objective to capacitate emerging sector of water technology is agreeable but it needs to expand its coverage from human resource capacity building to technology transfer. And implementation.
SOUTH WATER WORKS CONSTRUCTION AND DRILLING ENTERP	Our departments are not prepared their plan for training and recruitment. No budget planned for this year, it is tentative.
REGION: SNNPR	***11.3 SECTOR: PRIVATE ENTERPRISES***
NAME OF ORGANIZATION	**COMMENT**
TARIKU G/MESKEL WATER WORKS CONSTRUCTION	The current problem in Ethiopia, especially in water construction water is mainly the problem of lack skilled technicians. The major base for this short coming is lack of skilled labour training institutes. The questioner may solve if all the govern
MULUGETA ANSHISO WATER WORKS GENERAL CONTRACTOR	Planning to train water technicians looks very crucial and may be helpful for those employees who have skill gap in the area as well as for the contractors who are employing them.
BEREKET WONDIMU WATER WORKS CONTRACTOR	It is good beginning to respond quality and sustainability of this sector and can play great role in future.

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AGFT CONSTRUCTION PLC	I am really happy to see such an organization in our country and i hope it will solve/ minimize problems associated with labour in water resource sector. In behalf of our company i would like to thank you for giving us these opportunities.
AGFT CONSTRUCTION PLC	I am really happy to see such an organization in our country and i hope it will solve /minimize problems associated with labour in water resource sector. In behalf of our company I would like to thank you for giving us these opportunities.
Y.K.G.C	All the private and governmental institutes /universities should give an attention on trainer professional qualification
12 **REGION: AFAR**	*12.1* ***SECTOR: GOVERNMENT BODIES***
NAME OF ORGANIZATION	**COMMENT**
AWASH ARBA WATER SUPPLY OFFICE	We want to upgrade our service but since most of the time the water board members are busy we do not get an opportunity to have a meeting with them. - The billing tariff system is not renewed, sales is not satisfactory.
DUBTI TOWN WATER & SEWERAGE SERVICE	-Water board administration is not appropriate for us. It gets handicapped in finance and every movement of our growth (our effort) - transportation shortage to reach places & to maintain the damage.
AWASH TOWN WATER SUPPLY	Training staffs is very important to enhance our motto which is 'water is basic for life'. We work hard for this motto.
GEWANE TOWN WATER SUPPLY SERVICE	There is organizational structure in place but from 2013 up to know the system doesn't work. Now the water board is supposed to administer the water office, but could not meet for discussion.
MILLE WATER SUPPLY SERVICE	The water supply services organization collect the water bill but cannot administer the finance, and because of this it could not maintain and expand the pipe line. As a result of this water shortage is created in the town. The water board doesn't allow to discuss about the water shortage problem in the town
AWASH FENTALE WEREDA WATER OFFICE	Support in the area of technical equipment, office furniture, transportation facilities such as vehicles and motor cycles and capacity building of staffs are required
GEWANE WOREDA WATER OFFICE	Some NGOs like JICA and others do not give any training to our technical employees, therefore, we would like to get the opportunity to train our technicians

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AFAR REGIONAL WATER RESOURCES BUREAU	Since our organization works on a very serious issue of the region that is the water supply of the region, it needs very qualified and well skilled employers and also needs different equipment, instruments and trainings. Therefore we need a too much help and response on this huge issue and also we are looking for your kindly support.
AMIBARA WOREDA WATER RESOURCE OFFICE (ANDIDO)	- It is good to have an opportunity to train our technicians - it is better if we have an office in a proper way and some equipment
KEBRI BEYAH TOWN WATER SUPPLY SERVICE AUTHORITY	We collect the money only for four months for the rest months totally no water. Our main problem is mainly power because the location of well in around 25km from the town that cannot manage.
13 REGION: SOMALI	***13.1 SECTOR: GOVERNMENT BODIES***
NAME OF ORGANIZATION	**COMMENT**
JIJIGA ADMINSTRATION W.S. & SEWERAGE AUTHORITY	Now we are on the good truck because the water reservoir from the Taten & Koreder are online hope fully we reach our goal to cover 80%. In addition our employee needs training from this we upgrade ourselves.
JIJIGA WOREDA WATER OFFICE	If we helped to purchase the material we can maintain the deep well transport problem
REGION: SOMALI	***13.2 SECTOR: PUBLIC ENTERPRISES***
NAME OF ORGANIZATION	**COMMENT**
SOMALI DESIGN AND SUPERVIDION WORKS ENTERPRISE	The Somali Design and Supervision Works Enterprise (SDSWE) is established under Ethiopian Somali regional state to work as a public enterprise in August 2010, with the Somali regional state cabinets regulation and later on by proclamation regional government counsel of no 148/2014. Being a young, at the Enterprise is currently fulfilling its structure and is engaged in the study, design, construction supervision & contract administration of water resources projects related projects like road, building and geology and hydrological study. Authorized capital of the Enterprise is ETB birr 100million. The enterprise is expected to play crucial role in the areas of water resources studies, buildings and road constructions development through study and design for water supply and sanitation, irrigation and drainage, hydropower generation road building land use planning and environment studies and other related works. However it is not easy to accomplish this assignments without capable human resource both technical and managerial personnel.

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14 **REGION: BENISHANGUL GUMUS**	*14.1* ***SECTOR: GOVERNMENT BODIES***		
NAME OF ORGANIZATION	**COMMENT**		
BGRS WM&E OFFICE	We as regional water bureau prepare 5 year gtp-2 plan to achieve water access coverage 100% at the end of 2012. So we expect more from EWTI to train professionals and technicians that are critical for the implementation of this GTP-2 plan.		
BAMBASI TOWN WATER SUPPLY & SEWERAGE SERVICE	We are short of professional staff and we highly appreciate the training services of EWTI		
ASSOSA TOWN WATER SUPPLY AND SEWERAGE ENTERPRISE	We are happy for your study because I am sure that you identify our organization problems that are need for us for example training, technology transfer, laboratory service, technical support we expected from you within a short period of time. Thanks		
ASSOSA WOREDA WM&E OFFICE	- Establishment of electromechanical department COC center is very important -academic upgrading movement was very narrow -manpower and labor incentive is weak -vehicle logistics insufficient		
REGION: BENISHANGUL GUMUS	*14.2* ***SECTOR: PUBLIC ENTERPRISES***		
NAME OF ORGANIZATION	**COMMENT**		
BGRS WWC ENTERPRISE	-This type of assessment helps our enterprise in future to fulfill the gap of skill in drilling machine operation and in ground water investigation as well as in managing our enterprise.		
15 **REGION: FEDERAL**	*15.1* ***SECTOR: PUBLIC ENTERPRISES***		
NAME OF ORGANIZATION	**COMMENT**		
WATER WORKS DESIGN AND SUPERVISION ENTERPRISE	The questionnaire that requests the amount of the enterprise budget hasn't relation with training service.		
EWWCE	I would like to appreciate your method of survey it required detail and tangible information. The objective of your organization match our future qualified personally which is satisfy our demand		

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添付資料 8：調査結果速報ワークショッププログラム

添付資料 8

Workshop on

Quick Report of the Labor Market Demand Survey on Water Technicians in Ethiopia

December 1, 2015

Capital Hotel, Addis Ababa

Program:

Time	Agenda	Presenter
8:30 - 9:00	Check-in	
9:00 – 9:10	Opening Remarks	EWTI - DG
9:10 – 9:25	Introduction: Background and framework of the Survey	Zewdu
9:25- 9:35	An overview of EWTI's GTP II	Girma
9:35 – 9:45	Perspective from Private Sector	Hilemichael (& Kurata)
9:45 – 10:05	Tea Break (20 min.)	
10:05 – 10:25	Voices from Technicians : Findings from Focus Group Discussions	Yonas
10:25 – 11:25	Field Survey Report -Background(significance of labor demand survey) -Objective, scope, and limitation of the survey -Methodology -Survey areas and team formation -Survey findings +profile of respondents +profile of technical employees +profile of technicians & assistant technicians +labor demand projection +training issues (past and future) +expectation to EWTI -Conclusion and Recommendation -Product of survey: Database	AG Consult
11:25 – 11:35	Comments from JICA Advisor	Kurata
11:35 – 12:15	Q & A, Discussion -What preparation is necessary / is taking place to EWTI to meet the demand? -Policy implication	
12:15 – 12:25	Closing Remarks	EWTI-DG, JICA
12:25 – 13:00	Lunch	

Facilitator: Zewdu Seifu, Registrar of EWTI

添付資料９：データベース画面例

添付資料 9

データベース（ACCESS）の画面例