Proposal and Guideline for Baseline Survey

For Oromia Irrigation Development Authority (OIDA)
Monitoring & Evaluation System

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Agriteam Canada Consulting Ltd.

In association with:
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ACRONYMS AND ABBREVIATIONS

AGP  Agricultural Growth Program
CI   Confidence Interval
CL   Confidence Level
DIDA District Irrigation Development Authority
ETB  Ethiopian Birr
FF   Finfinnee
FHH  Female-Headed households
FiMHH Female in Male-Headed households
FS   Farm Survey
HH   Households
IWUA Irrigation Water User Association
JES  Job-embedded Support
KM   Kilo Meter
LM   Logic Model
LSI  Large Scale Irrigation
M&E  Monitoring and Evaluation
MHH  Male-Headed households
MI   Micro Irrigation
MoA  Ministry of Agriculture
MSI  Medium Scale Irrigation
OIDA Oromia Irrigation Development Authority
OSMIS Oromia Small Scale and Micro Irrigation Support
PB and M & E Planning, Budgeting, Monitoring & Evaluation
PI   Partner Institutions
PIDM Participatory Irrigation Development and
RBM&E Results-based Monitoring & Evaluation
RMEE Regional Monitoring and Evaluation Expert
SD   Standard Deviation
SMIS Small Scale and Micro Irrigation Support
SMS  Subject Matter Specialist
SPSS Statistical Product for Service Solutions
SSI  Small Scale Irrigation
ToR  Terms of Reference
ZIDA Zone Irrigation Development Authority
Executive Summary

Results of any development endeavor can be tracked, measured and realized only if an effective and well-designed M&E system put in place. In this regard, OSMIS is providing a capacity development support for OIDA, among others, establishing a standard M&E system based on the request and censuses building interactions with OIDA senior officials. The system establishment consists of two stages namely; design and implementation. In the design stage, in close and active participation with OIDA, major activities including choosing or understanding the existing outcomes and outputs, developing an LM, 52 indicators for outputs and outcomes in the LM, an M&E framework, 5 data collection tools and providing SPSS training for 10 experts from OIDA have been undertaken since December 2015. Currently, OIDA is in the implementation stage of the system where setting baseline data and targets are the most important milestones.

A baseline data greatly supports project in efficient and effective planning, monitoring and evaluation. It is used to learn about current or recent levels and patterns of performance. It helps to inform decision makers about current circumstances to identify strategies that promote increased irrigated agricultural production and productivity for small holder farmers.

Based on the final list of 19 indicators that require data through baseline survey, the following 5 tools (see annex-3 for details) were developed to collect quantitative and qualitative baseline data:

- Farm Survey - to collect data from farmers through structured interviews
- WUA Assessment – to collect data from WUA through group interview
- Efficiency Assessment - to collect data through self-experiment
- Inspection of Schemes – to collect data through observation and from records
- Verification Assessment – to collect data through observation and from records

To get dependable baseline data, it is found important to conduct the baseline survey in both irrigation seasons of the 2009 Ethiopian fiscal year or 2016/17. In the first season, it will be conducted twice (during and after the season) depending on the type of information that can be captured either in the season or after. WUA, efficiency and verification assessment, and inspection of schemes will be conducted during the irrigation seasons while farm survey will be undertaken immediately after the seasons to capture production and productivity related data. Accordingly, this baseline survey proposal is prepared to conduct the survey “during the first irrigation season” which is scheduled from 4-10 December 2016, and “after the 1st irrigation season” which will be conducted most likely in February 2017. The survey for the 2nd irrigation season will be conducted upon the availability of resources.

The Survey will be conducted by OIDA experts, organized into three teams, who have been involved from the very first stage of the M&E system Development. The survey will cover six SSI schemes in six woredas from three agro ecological zones- East Harargie, Horroguduru Wollega and Arsi- selected by OIDA. Employing stratified disproportional random sampling techniques, 211 HHs will be selected for farm
survey interview. Survey using the other four tools will be made at worda, WUA and scheme level. The estimated budget is amounting to birr 150,136.

After collecting the data, data cleaning and entry into SPSS, analysis, report writing, sharing and using the findings for baseline and targets will be the subsequent activities in the implementation stage.

1. Background

SMIS Project, in alignment with the SSI and MI capacity development strategy of MoA, aims to support the capacity of concerned Partner Institutions (PIs) in the four major regions. One of the areas of those capacity development is improving the capacity of public institutions to coordinate and manage the planning, design and construction of SSI schemes. Result Based Monitoring & Evaluation (RBM&E) is one of the thematic areas that is intended to be supported by the project.

The SSI and MI Capacity Building Strategy was formulated with the guiding principle that **water is a natural resource commonly owned by communities and its fair distribution and efficient use should be exercised with the ultimate objective of improving production and productivity of the irrigated agriculture and subsequently improve food security for rural households and increase supply of raw materials to domestic factories and industries and export earnings.**

OIDA is one of the public institutions, which is in charge of improving the production and productivity of irrigated agriculture. To achieve such a higher level objective, OIDA requires a systematic management strategy. As a response, OSMIS is rendering its support to establish a result based M&E system where currently the design stage of the system is completed. So far, a Logic model and an M&E framework have been developed, 51 Key performance indicators to monitor outputs and outcomes have been selected, 6 data collection methods and tools were designed, pilot test was conducted, with a view to analyses the baseline data, SPSS training was provided for 10 OIDA experts. All these outputs have been achieved through OIDA Experts active participation. In the implementation stage of the system, establishment of baseline data on 19 indicators, is the first step. This proposal has been developed to illustrate what information is needed, how, where and by whom it can be collected. It is to be noted that the basis for identifying the information needs should be the logic model which is already defined earlier in the design stage of the system.

2. Purpose of a baseline survey

A baseline survey greatly supports project in efficient and effective planning, monitoring and evaluation of a project. A baseline data is the first measurement of an indicator that sets the current condition against which future change can be tracked. It helps to inform decision makers about current circumstances before embarking on setting project targets. Importantly, baselines provide the evidence by which decision makers are able to measure subsequent project performance. It is used later to provide a comparison for assessing the net effect of the project. One cannot project performance into the future (set targets) without first establishing a baseline. Though OIDA is persistently managing LSI, MSI, SSI & MI
projects, it can conduct baselines and set targets periodically (e.g. every 5 years) to measure changes occurred due to its effort.

There are two common ways to measure changes:

- ‘with and without’ project – this seeks to mimic the use of an experimental control, and compares change in the project location to change in a similar location where the activity has not been implemented, and
- ‘before and after’ project – this measures change over time in the project location alone.

However, the scope of this baseline is limited to the ‘before and after’ scenario as it is difficult to get true controls.

3 Survey Scope

Though OIDA is managing various irrigation schemes in terms of number and type, this survey will only consider 6 functioning small scale irrigation schemes that are found in six districts of three agro ecological zones namely: East Harargie, Horroguduru Wollega and Arsi. These zones are selected by OIDA which are considered representative having all characteristics of SSIs in Oromia Region.

4 Survey Plan

Setting baseline involves collecting data on the selected indicators for which collection tools, sources, sample size, team building, schedule and finance to be determined pre-hand.

4.1 Indicators and data collection tools

In the M&E system, 14 expected results in 3 levels (an intermediate; 5 immediate and 9 output) and 52 meaningful, relevant and cost effective indicators have been developed for which data to be collected through various methods and tools from different sources. However, the baseline survey is confined to collect only values for 19 indicators using 5 collection tools which are already coded and pre-tested. The summary of data collection methods, no and type of indicators is illustrated in the following table.

<table>
<thead>
<tr>
<th>Data Collection Tool</th>
<th>Indicators to be Measured</th>
<th>No of Indicators</th>
<th>Comment</th>
</tr>
</thead>
</table>
| Farm survey on selected schemes | B. Average yield per hectare for irrigated crops (MHH/FHH)  
C. Average % of irrigated area used for market-oriented crops (MHH/FHH)  
D. % of market-oriented crops rejected by traders (MHH/FHH)  
2000a. Level of satisfaction of farmers (MHH/FHH/FIMHH) with extension service delivered | 12 (3 intermediate, 6 immediate, 3 output level indicators) | Tool already developed  
To be completed after each irrigation season |
<table>
<thead>
<tr>
<th>Data Collection Tool</th>
<th>Indicators to be Measured</th>
<th>No of Indicators</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3000a. % of farmers (MHH/FHH) using irrigated agronomy packages</td>
<td></td>
<td>• This tool can be also discussed with ZIDA/ districts (separate collection of indicators needed)</td>
</tr>
<tr>
<td></td>
<td>3000c. Average yield per hectare for main agronomic packages, by package (MHH/FHH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4000a. % of requested inputs supplied by supply organizations on-time (before irrigation season)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4000b. % of farmers (MHH/FHH) utilizing minimum technology package per hectare</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5000a. % of farmers (MHH/FHH/FIMHH) receiving advice on crop selection based upon market forecast</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1400c. % of schemes implementing water schedule as planned</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1400e. Satisfaction of farmers (MHH/FHH/FIMHH) with irrigated water delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4200c. % of irrigated farmers (MHH/FHH/FIMHH) supported on the distributed technologies and inputs for irrigation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Verification Assessment on selected schemes | 1000a. Average % of irrigated command area per scheme receiving water in new modern/old modern (greater than 5-year-old) schemes 1000b. % of schemes delivering 100% of water for whole system in new modern/old modern schemes | 2 Immediate outcome indicators | • Tool already developed  • To be completed once during irrig. season  • (This tool can should be also discussed with ZIDA/ districts (separate collection of indicators needed) |

| Efficiency assessment on selected schemes – 2 times per irrig. season | 1000c. % efficiency of scheme (water conveyance and distribution) for modern and traditional schemes 3000b. Yield per cubic meter of water at farm gate for selected packages (water productivity) | 2 Immediate outcome indicators | • Tool already developed  • To be completed twice during irrig. season                                                                                                                                   |

| Inspection of selected schemes | 1200b. % of completed schemes which meet quality standards                                                                                                         | 1 output                  | • Tool already developed  • To be completed once during irrig. season                                                                                                                                   |

| Water user association assessment tool | 1400c. % of schemes implementing water schedule as planned 1400d. % of water user associations with ability to manage scheme operations and maintenance | 2 immediate outcome indicators | • Tool already developed  • To be completed once during irrig. season                                                                                                                                   |

| Total | 19 indicators |                                                                                                              |                                                                       |

The remaining 33 indicators will use secondary data from OIDA and ZIDA reports, feasibility study documents, and other relevant documents.
4.2 Data collection tools and procedures

Data collection tools and procedures allow for the systematic collection of information pertaining to the baseline study objective. They include observation and questionnaires administered through face-to-face interviews. For baseline studies in OIDA, observation and administered/controlled questionnaire are the recommended tools and techniques. Observation involves the collection of information related to the issues under investigation by watching, listening, inspecting and recording of information or activities noticed.

4.2.1 Farm Survey

The farm survey will cover the 12 indicators with a written questionnaire which developed with questions defined earlier. It involves a list of closed questions with a choice of possible responses, ranking and/or ratings. However, open ended questions will also be asked. Informants will be chosen in advance as representative samples of the wider scheme beneficiaries before interviewing begins. Out of the 12, values for 2 indicators (B & 3000c) will be re-conducted in an annual basis from zone reports at the end of each physical year just to triangulate what the beneficiaries stated during the farm survey. All indicators could be also used at the mid and/or end of every five years to assess changes in productivity, irrigation water system, individual water user’s satisfaction, etc. The number of questionnaire to be used depends on the sample size i.e 211 HHs. Farm survey will be done twice in a year under consideration.

4.2.1 Verification Assessment

Verification Assessment is done through discussion with ZIDA scheme administration sector against the field observations to triangulate scheme information gathered through interview or other methods before. There are 2 immediate level indicators to be assessed through this method. Verification Assessment will be done per irrigation season (twice per year). Data for 2 indicators (1000a & 1000b) will be re-conducted in an annual basis from zone reports at the end of each physical year. The number of assessment is one per the six sample schemes that were determined by OIDA.

4.2.3 Efficiency Assessment

Water efficiency assessment is measuring the amount of water flow at the conveyance and distribution structures to know the water is used efficiently or there is a wastage. The efficiency assessment tool will be used to get the base value for two immediate level indicators. The number of assessment is one per sample schemes, i.e 6.

4.2.4 Water Users Assessment

The purpose of the assessment is to assess Irrigation Water Users Associations (IWUAs) technically, financially and administratively as being partially responsible for irrigation system
management during the investment period in each selected schemes. Water Users Assessment tools will be used to collect base value for 2 output level indicators. The number of assessment is one on IWUA per SSI Scheme, i.e 6.

4.2.5 Inspection Assessment

This assessment tool will be used to assess the quality of irrigation infrastructure meeting the quality standards set by OIDA. There will be one output level indicator to get base value with this tool. The number of assessment is one per sample SSI scheme.

4.3 Data collection tools and procedures

Data collection methodology describes the way in which the data will be collected. We will use interview—both individual and group, physical assessment, and inspection of schemes. The details for data tools and methods are identified in the following table:

Table 2  Survey Tools and Procedures

<table>
<thead>
<tr>
<th>Data Collection Tools</th>
<th>Number of tools to be used</th>
<th>Data sources</th>
<th>Data Collection Methods</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Survey</td>
<td>211</td>
<td>Zone Irrigation Dev. &amp; Ext. Farmers (MHH/FHH) in selected schemes</td>
<td>Survey - Farmers Interview</td>
<td>Indicator B and 3000c for ZIDA</td>
</tr>
<tr>
<td>Verification Assessment</td>
<td>6</td>
<td>Zone scheme administration Selected schemes</td>
<td>Verification Assessment</td>
<td>Interview ZIDA experts/heads; Observation (Indicator: 1000a &amp; 1000b)</td>
</tr>
<tr>
<td>Water Users assessment</td>
<td>6</td>
<td>Water user groups and farmers (MHH/FHH) in selected schemes</td>
<td>Interview of IWUA members</td>
<td></td>
</tr>
<tr>
<td>Efficiency Assessment</td>
<td>6</td>
<td>Selected schemes</td>
<td>Efficiency assessment</td>
<td>Survey Team experiment</td>
</tr>
<tr>
<td>Inspection</td>
<td>6</td>
<td>Selected schemes</td>
<td>Inspection/Woreda</td>
<td>Interview woreda experts/heads; Observation</td>
</tr>
</tbody>
</table>
5 Sampling Method and Size

5.1 Sample size determination

The population is the total group from which samples are taken for statistical measurement—in OIDA case, population is the beneficiary HHs in a given SSI scheme. Rather than surveying every HHs (census), it is sound efficient to interview a sample of the population. Using samples is less costly in terms of time, money, materials, human resources, and effort than surveying or interviewing an entire population. A good sample is a subset of the population that reflects the characteristics of, or is representative of, the target population. In other words, such a sample must contain all the important characteristics of the population from which it is drawn. One important aspect when planning an M&E program is determining how many households or respondents to sample. There are two ways of determining the sample size representing the population: Statistical calculation and calculation based on value judgement.

5.2.1 Statistical calculation

If we have a small to moderate population, we should use a standard formula.

i/ The standard formula for sample size is:

\[
\text{Sample Size} = \frac{[z^2 \times p(1-p)]}{e^2} \div \left(1 + \frac{[z^2 \times p(1-p)]}{e^2 \times N}\right)
\]

- N = population size
- z = z-score
- e = margin of error
- p = standard of deviation (Since this value is difficult to determine before we have the actual survey, most researchers set this value at 0.5 (50%).)

ii/ Slovin’s formula:

This formula is widely used in statistical analysis as a tool to determine the minimum sample size of a population that when we have no z-score and standard deviation.

\[
\text{Sample Size} = \frac{N}{1 + Ne^2}
\]

- N = population size
- e = margin of error
Note that this is the least accurate formula and, as such, the least ideal. We should only use this if circumstances prevent us from determining an appropriate standard deviation and/or confidence level (thereby preventing us from determining our z-score, as well).

Definitions and meanings of key statistical parameters and values are described as follows:

1. **e = Margin of error, also referred to as "confidence interval," refers to the amount of error you wish to allow in your results**

   - The margin of error is a percentage the indicates how close our sample results will be to the true value of the overall population in our study.
   - Smaller margin of errors will result in more accurate answers, but choosing a smaller margin of error will also require a larger sample.
   - When the results of a survey are presented, the margin of error usually appears as a plus or minus percentage. For example: "35% of people sampled agree with “strongly agree”, with a margin of error of +/- 5%".
   - In this example, the margin of error essentially indicates that, if the entire population were asked the same poll question, we are “confident” that somewhere between 30% (35 - 5) and 40% (35 + 5) would agree with “strongly agree”.

2. **CL = Confidence level is closely related to confidence interval (margin of error).**

   - This value measures our degree of certainty regarding how well a sample represents the overall population within our chosen margin of error.
   - In other words, choosing a confidence level of 95% allows us to claim that we are 95% certain that our results accurately fall within our chosen margin of error.
   - A larger confidence level indicates a greater degree of accuracy, but it will also require a larger sample. The most common confidence levels are 90% confident, 95% confident, and 99% confident.
   - Setting a confidence level of 95% for the example stated in the margin of error step would mean that we are 95% certain that 30% to 40% of the total concerned population would agree with “strongly agree” of our survey.

3. **z = The Z-score is a constant value automatically set based on your confidence level.**

   - It indicates the "standard normal score," or the number of standard deviations between any selected value and the average/mean of the population.
We can calculate z-scores by hand, look for an online calculator, or find our z-score on a z-score table. Each of these methods can be fairly complex, however.

Since confidence levels are fairly standardized, most researchers simply memorize the necessary z-score for the most common confidence levels:

- 80% confidence => 1.28 z-score
- 85% confidence => 1.44 z-score
- 90% confidence => 1.65 z-score
- 95% confidence => 1.96 z-score
- 99% confidence => 2.58 z-score

4. *p = Standard deviation (SD) indicates how much variation we expect among our responses.*

Since this value is difficult to determine before we have the actual survey, most researchers set this value at 0.5 (50%). This is the worst case scenario percentage, so sticking with this value will guarantee that our calculated sample size is large enough to accurately represent the overall population within our confidence interval and confidence level.

5.2.2 calculation based on value judgement

Both of the sample size formula are designed to answer a single research question/phenomenon one would like to test. In addition, all of the key values – e, z, p- to be plugged in the formulae should be estimated. However, determining SD is difficult to determine without the actual survey.

M&E system of OIDA is not to test just a single phenomenon rather to have the base level of 19 important parameters/indicators stated in the M&E Framework. Therefore, it is better to determine the sample size based on value judgement. In this case, statistical calculation of the sample size is outside the scope of this document. The value Judgement approach requires consideration of variations of scheme beneficiaries from one scheme to another. Hence, it is sound to consider the following two options to determine the sample size.

Option 1: variable % of beneficiaries – the higher the beneficiary in a scheme, the lower the percentage of its population will be taken as a sample and vice versa.

Option 2: fixed % of population/beneficiary as a sample – *Option 2 is employed for OIDA*
5.2  Sampling Methods

Once the sample size is determined, selection process will start. Before going to the selection process it is important to know which selection method to be employed. Sampling methods usually are categorized in two types: probability sampling and non-probability sampling.

5.2.1  Probability sampling

This method is a method of sampling that uses random selection so that all units/cases in the population have an equal probability of being chosen. Selecting randomized and/or representative samples usually involves first-hand collection of data from people.

Selecting a sample using random (probability) sampling, or probability sampling is based on random selection of units (farmers) from the identified population. This sampling method eliminates subjectivity in choosing a sample and provides a statistical basis for claiming that a sample is representative of the target population. Every member of the target population has a known probability of being included in the sample. Several types of random (probability) sampling techniques are available evaluators- Simple Random Sampling, Stratified Random Sampling, Cluster Random Sampling.

5.2.1.1 Simple random sampling

Selecting a sample using random (probability) sampling, or probability sampling is based on random selection of units (farmers) from the identified population. This sampling method eliminates subjectivity in choosing a sample and provides a statistical basis for claiming that a sample is representative of the target population. Every member of the target population has a known probability of being included in the sample. Several types of random (probability) sampling techniques are available evaluators- Simple Random Sampling, Stratified Random Sampling, Cluster Random Sampling.
5.2.1.2 Stratified random sampling

This involves dividing the population into distinct subgroups according to some important characteristics, e.g. age, gender, race, socio-economic status, geographical distribution, etc. and then selecting a random sample out of each subgroup or strata. The population within each subgroup, called a “stratum,” are numbered separately, then a random sample is selected from each stratum.

![Figure 3 Stages in Stratified Random Sampling](image)

The principal reasons for using stratified random sampling rather than simple random sampling include:

1. Stratification may produce a smaller error of estimation than would be produced by a simple random sample of the same size. This result is particularly true if measurements within strata are very homogeneous.
2. The cost per observation in the survey may be reduced by stratification of the population elements into convenient groupings.
3. Estimates of population parameters may be desired for subgroups of the population. These subgroups should then be identified.

5.2.1.3 Disproportional stratified sample

In a disproportional stratified sample, the size of each stratum is not proportional to its size in the population. If we look up the demographics of beneficiaries in each scheme and find that 85% male and 15% are female headed households. We divide our population into strata based household type demographics. Here we have two strata, one for each of the household type. Using this information, we can conduct either a proportional stratified sample or a disproportional stratified sample. In this case we have to conduct a disproportional to accommodate more women in the sample. If the population consists of 30% or more FHH, we could employ a proportional stratified sample. In a proportional stratified sample, the size of each stratum in the sample is proportionate to the size of the stratum in the population.
5.2.2 Non-probability sample

This method does not involve random selection and methods are not based on the rationale of probability theory.

*Figure 4 Non Probability Sampling Methods*

5.2.2.1 Purposeful (judgmental) sampling:

Nonprobability sampling does not involve random selection, which does not mean nonprobability samples aren’t representative of the population. It is a sampling chosen based on who/which one thinks would be appropriate for the study and a sample to be selected based on an experienced individuals’ belief.

_Having the above theoretical background, let’s see how do we choose our sample in a stratified random technique._

A two-stage sampling method will be used for OIDA baseline where combining both random and purposeful sampling technique. At the first stage six SSI schemes were purposefully selected while in the second stage MHH and FHH in 7 to 3 ratio will be selected using stratified disproportional random sampling technique.

*Specific steps in the 2\textsuperscript{nd} stage sampling:*

I. partition each SSI Scheme beneficiaries into groups (strata), in our case MHH and FHH. For example, in Kombolcha SSI scheme, there are 134 beneficiary HHs. Using Option 2, the sample size, 20 HHs will be eligible for survey. Before selecting the 20 HHs, first we have to prepare sampling frame for MHH and FHH separately to satisfy stratification. This method can be interpreted as one level strata.

II. obtain a simple random sample from each group of HH (stratum) using either lottery approach or online random number calculator. In case of Kombolcha scheme, let’s assume there are 34 FHH and 100 MHH. To ensure the 7 to 3 ration between MHH and FHH, we need 14 MHH and 6 FHH from 20 sample size determined as eligible HHs to satisfy disproportional method. Then randomly select the sample size.

\[(20 \times 0.7) = 14 \text{ MHH}; \quad (20 \times 0.3) = 6 \text{ FHH}\]
To select the sample from the population, follow the following link to get random numbers online.  [http://stattrek.com/statistics/random-number-generator.aspx](http://stattrek.com/statistics/random-number-generator.aspx) It can also be done manually through lottery.

III. Collect data on each sampling unit that was randomly sampled from each group (stratum) and aggregate the results – mostly a mean average to set the baseline data.

Accordingly, the beneficiary farmers will be selected using random sampling to ensure that certain population subgroups- male vs female- are represented in the sample at least women to be 30% despite their number is less than 30% of the total beneficiaries.

If we could produce a list for both MHH and FHH separately ahead of time before field trip, we can use an on line random number generator to get 14 random numbers for MHH and 6 random numbers for FHH. This way we can identify how many survey participants we need from each stratum.

 Totally from all the six schemes, the proposed sample size as per option 2, i.e “Fixed percentage of the population” i.e 15% on average we will be having 211 HHs as a sample size. The detail is indicated in table 3 below:

**Table 3 Proposed Sample Size per each SSI Scheme**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Woreda</th>
<th>Scheme</th>
<th>Woreda Distance in KM from FF</th>
<th>Command Area (ha)</th>
<th># of actual beneficiary HH</th>
<th>WUA</th>
<th>Suggested Sample size in %</th>
<th>Estimated Sample Size</th>
<th>Estimated Sample size per team</th>
</tr>
</thead>
<tbody>
<tr>
<td>E/ Harargie</td>
<td>Combolcha</td>
<td>Dembia</td>
<td>555</td>
<td>50</td>
<td>134</td>
<td>Yes</td>
<td>15%</td>
<td>20</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Qersa</td>
<td>Water 02</td>
<td>71</td>
<td>350</td>
<td></td>
<td>Yes</td>
<td>15%</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Horroguduru</td>
<td>Horro</td>
<td>Bolo</td>
<td>30</td>
<td>116</td>
<td></td>
<td></td>
<td>15%</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Wollega</td>
<td>Jimma Genete</td>
<td>Goraso</td>
<td>30</td>
<td>160</td>
<td></td>
<td></td>
<td>15%</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Arsi</td>
<td>Tiyo</td>
<td>Ketur 1</td>
<td>175</td>
<td>108</td>
<td>322</td>
<td></td>
<td>15%</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ziway Dugda</td>
<td>Areta Chufa</td>
<td>207</td>
<td>100</td>
<td>324</td>
<td></td>
<td>15%</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>389</td>
<td>1406</td>
<td></td>
<td></td>
<td>15%</td>
<td>211</td>
<td></td>
</tr>
<tr>
<td>Average sample size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15%</td>
<td>211</td>
<td></td>
</tr>
</tbody>
</table>

Source: PBM&E, OIDA

For the other survey components, such as Verification Assessment; Efficiency Assessment; Water Users Assessment and Inspection Assessment, the assessments will be conducted on the selected schemes, WUA, ZIDA and DIDA.
6. Selecting and training/ briefing the M&E team

Surveys and personal interviews are popular forms of data collection for evaluating agricultural projects and programs and generally utilize more than one person to collect data. Although many factors may affect data quality, minimizing interviewer variance is critical for acquiring quality (valid and reliable) data. As so many factors may affect variance in results attributed to interviewers, careful selection and training of interviewers can help ensure data quality and consistency. Fortunately, OIDAs survey will be conducted by relevant experts from different processes of OIDA, who are the one actively involved in the entire process of M&E system development and more specifically on data collection tool development and pre-testing. Accordingly, nine experts and process owners has been nominated by OIDA officials to form an M&E working group/ team. OIDA is responsible, have the expertise and is also capacitated by OSMIS to conduct and manage the survey process. On top of this, they will be conducting ongoing monitoring activities thereafter. Therefore, the survey team should encompass the team members unless unforeseen circumstances happen. There will be three teams for the survey comprising of 3 experts each. According, the three team, consisting of 10 experts in total, have been established. (Annex 3)

7. Briefing the team and preparing for the survey

After identifying the team to conduct the M&E, some guidance is essential prior to actual data collection that all individuals involved in data collection understand the correct procedures, keep diligent records and can troubleshoot issues in the field. Two of the team members have got an opportunity for hands-on training during the pre-test of the tools and they can share their insights during the team briefing session to be conducted in early December 2016.

Although the specific format of training is beyond the scope of this document, the main areas to be covered include:

7.2 Goals of the M&E program (collecting data) include:

- **Project management**: Is the project having the intended results? What can be done differently to better meet goals and objectives? These are the questions that monitoring and evaluation allow organizations to answer based on the information base. Collecting M&E data is necessary to track project/program progress and performance.

- **Learning**: Monitoring and evaluation are important management tools to track progress and facilitate decision making. The greatest beneficiaries of an evaluation can be the community with whom the organization works. By closely examining our work, our organization can design programs and activities that are effective, efficient, and yield powerful results for the community. For example, the MoA SSI capacity development strategy of 2011 emanates from M&E findings and learnings.
7.2 An introduction to the study
- The purpose of a baseline study is to provide an information base against which to monitor and assess an activity’s progress and effectiveness during implementation and after the activity is completed.
- Survey tools/ instruments
- The survey method includes surveys interviews, group interview, observation and experiment
- Selected SSI Schemes, Zones & Districts
- Sampling technique (stratified random) and size (211)

7.3 Review of the questionnaire and interview protocols

Comprehensive reviewing of all questions is mandatory to obtain informed consent among the team member specifically Efficiency Assessment as it requires technical measurement of water efficiency. Specific benefits are:

- Be familiar with the questions in the interview protocol in order to respond to any inquiries from the respondent about the question
- Questions (a protocol generally groups questions by topic since it makes sense for the flow conversation)
- The team has to gone through the protocol to get to obtain informed consent among the team member

7.4 Tips for Effective Data Collection Techniques for the Structured Interview – (The role of the survey team)

1. Choosing Situation-specific dressing – depends on the respondents and context of the interview

2. Introduction: The interviewer begins the interview by introducing himself or herself, its organization and the study. The introduction begins the process of building a positive empathy with the respondent. It is the basis for gaining cooperation. The introductory statement is presented in the beginning of the data collection tool. The interviewer should:
   - Conduct the interview in a semi-private area where the respondent will be comfortable answering questions;
   - Identify himself/herself, the purpose of data collection, the use of the information, and the interview process;
   - Tell the respondent that he/she has a right to anonymity and confidentiality, a right to choose not to participate in the data collection process, and a right to refuse to answer any particular question; and
• Ask the respondent if he/she has any questions before beginning the interview.
• The interviewer should think carefully about how much time is to be allotted to the interview and how many questions can be covered in that time – be optimal

3. Building rapport: Rapport is the feeling of being comfortable with someone and trusting them. The interviewer should work to put the respondent at ease by: (1) being an active listener and (2) watching and responding in kind to the respondent’s body language and physiology, including facial expressions, gestures, and the quality and type of movements.

4. Asking the questions:
• Follow the data collection protocol exactly: even slight variations in wording may affect responses.
• Ask all questions.
• Ask questions exactly as worded.
• Never assume or anticipate responses.
• Be patient and let the respondent finish.
• Ask all questions in a positive manner.

5. Probing: Effective interviewers need to be proficient at probing. Probing is not a data collection technique per se. Instead, it is a technique for drawing information from respondents in an indirect way during interviews. It is an act of asking additional questions in order to discover the answer as our goal is to let the respondent ‘tell the story’. Probing augments/ supplements other data collection techniques such as in-depth interviews, group discussions, or open-ended questions in structured interviews.

In our structured interview protocol, there are several numerical and text for open ended questions which might require more probing. Another common set of questions that may require probing are those that asking a respondent to rank or rate response. Typical questions requiring probing include: recalling the quantity of a particular crop produced in the last irrigation season or recalling the amount of fertilizer or pesticide used during irrigation season.

In general probes should also be used whenever:

✓ the respondents give an answer that doesn’t fit and seem to have not understood the question
✓ the respondent seems to have not understood the question
  ▪ e.g. in Question D01 of Farm Survey if they seem have not understood “Do you use agronomic package”?, the interviewer has to explain.
✓ the question specifically indicated that we should probe using the respective technique
  ▪ clarity (can you be more specific? can you telling me more about that?)
  ▪ Completeness (anything else, tell me more)
Other probing techniques (Repeat the question, echo their response, pause a second, encourage talking by nodding your head, etc)

6. Listening to and encourage the respondent to talk. This means:
   - Giving space for long answers, making encouraging noises.
   - Not answering back when a respondent is provocative/provoking, but accepting what they say. —do not react
   - Not making verbal judgments about what people tell you.
   - Recording answers even if you think they are incorrect.
   - Responding to questions (if asked) at the end of the interview.
   - Continuing to listen even if you don’t understand (ask for clarification during a break in the conversation using wording such as “could you please tell me more about...”).
   - Probing that indicates engagement with what the respondent is saying and encourages the respondent to explain their answer in more detail.
   - Downplaying/ moderating status differences verbally as well as through body language using body language that does not appear judgmental or exposes any negative feelings (for example, don’t cross your arms).
   - Using body language that signals interest (focus on the interviewee, maintain eye contact if culturally appropriate, nod, smile, sit upright, stay alert, and engage).
   - Although the interviewer should encourage the respondent to talk, there needs to be a careful balance with moving the interview along in a timely manner.

7. Maintain a neutral attitude so as not to influence how the respondent answers the question.
   - Do not suggest an answer
   - Do not assume answers ahead of time
   - do not give your own opinions
   - Do not agree or disagree with the person’s comments
   - Avoid making gestures that could indicate that you approve or disapprove of a respondent’s answer or comment

8. Recording the answers: Ask and record answers to all questions. Use insightful probing when necessary to identify the appropriate pre-coded responses or, in the case of open-ended questions, write the exact wording used by the respondent.

9. Prompting: Follow the data collection protocol for each question

10. Ending the interview (the interviewer should always close on a positive note) by:
    - Thanking the respondent for his or her collaboration and time.
    - Indicate how useful and productive the interview has been. Let them know!!!
    - Asking if the respondent has any questions.
    - Addressing any questions raised.
11. Make sure that you cover all the material in the interview protocol before closing the interview, the interviewer should review the protocol and return to questions that were not covered. Ask if the respondent has any questions about the study.

12. Review: Upon leaving the respondent, locate a place where you can review the questionnaire to ensure that you have not missed anything. If you missed a question or are uncertain of a response, return and complete or correct the tool immediately.

13. Ongoing Interaction (debriefing) among the tea members at the end of each day

8. Conduct the M&E

The survey will be conducted twice for each irrigation season. For the first irrigation season, the farm survey will be done after the seasons, most likely in February 2017 and while the survey using the other 4 tools will be done during the irrigation seasons in November 2016. In the 2nd season, the farm survey will be done in June 2017 while other 4 tools will be in March 2017. The duration of the Survey for farm survey will take 7 days while for the rest of the assessments it will take 5 days for each team. The Survey schedule is attached as annex 1 to this document.

9. Quality Assurance

Quality checks during the fieldwork should be given a very high priority to minimize nonresponse errors, either missing or incomplete data. Nonresponse can create bias in the results for each surveyed unit. To mitigate such problem, the quality control process should include multiple filters. The interviewer is responsible for checking the data immediately after they have been collected. The supervisor and/or coordinator should perform random checks at a later stage. Consistency checks is built into the farm survey and IWUA questionnaire. Team members from OIDA Planning and M&E office and OSMIS RMEE will take the responsibility of quality assurance at the field. In addition, each team member should be debriefed at the end of each day to find out what experiences he/she had during the day and the difficulties faced. If they are finding it difficult to collect certain information this should become obvious during the debriefing and a solution found. Keep record of any difficulties in case explanations are needed for certain discrepancies during analysis and presentation of results.

10. Entering and reviewing the data

Once the surveys have been completed, the collected data should be cleaned and collated/gathered into one database. Once the data is entered, it should be reviewed ("cleaned") to ensure that entry and outlying data points are identified. Once a clean and complete dataset is obtained, analysis can begin. OIDA, with OSMIS support, will have data entry staff. The data analyst from the planning and Monitoring process of OIDA, will supervise the data entry and carry out data cleaning by using different tests like range tests, etc., to ensure accuracy of data.
When working with paper-and-pencil surveys, the quality benchmark for the data entry process should be that the raw physical data are exactly replicated in the digitized version, with no modifications made to them while they are being entered. To minimize data entry errors, it is advisable to commission a double-blind data entry procedure that can be used to identify and correct for any remaining errors.

12. Analyzing the data

One of the tasks that is most often neglected in an M&E programme is that of analyzing, understanding and, most vitally, using the M&E findings to improve project activities and results. Shortly after data collection, preliminary results should be provided to key stakeholders and decision-makers.

A variety of methods exist for analyzing results, including to calculate frequencies, such as the percentage of households that received the OIDAs support, comparison between two variables, central tendencies, etc. Such analyses can effectively summarize outputs and outcomes and graphically provide a description of the programme. OIDAs M&E team has been provided with the SPSS training where they have got the necessary skills and knowledge of using the SPSS for data management and analysis. After having the base level for indicators, setting targets will be the next activity.

12.1 Report Writing (First Draft)

A draft report will be developed on an agreed format highlighting the major findings of the baseline survey. The draft will be shared with the PIs to get their feedback and comments, which will be incorporated in the Final Draft.

12.2 Final Report - Disseminating the results

After the feedback and comments of the client, the required changes will be made to the report and a final version of the baseline report will be submitted to the OIDA. Baseline survey material and filled questionnaires will be submitted to OIDA once they have taken the Final Report.

13. Resources Requirement

13.1 Human resources

The Farm Survey will be done by 3 teams comprising of 3 experts from OIDA, one alternate from three zones and one alternate from 6 districts which will make up one team with a 5 members on each scheme. Other surveys can be done with one team comprising of four thematic area experts to cover all survey zones/ woredas/ schemes. In addition, the RMEE from OSMIS will
provided JES (coordination) for each team to oversight the process. Expert allocation in the three teams have been undertaken by OIDA. (Annex 3)

Table 4 Data Collection Methods and Human Resource allocation

<table>
<thead>
<tr>
<th>Data Collection Tools</th>
<th>Data Collection Methods</th>
<th>Data Source</th>
<th>Frequency</th>
<th>Responsibility as per the PMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Survey</td>
<td>/ Survey/ Farmers Interview</td>
<td>Farmers in selected schemes</td>
<td>Per irrigation season (end of)</td>
<td>Survey Team – Irrigation Dev., Ext. and Planning.</td>
</tr>
<tr>
<td>Verification Assessment</td>
<td>Interview and Assessment/observation of SSI</td>
<td>Zone, Woreda and selected schemes</td>
<td>Per irrigation season (during)</td>
<td>Survey Team – Irrigation. Dev., Scheme and Ext</td>
</tr>
<tr>
<td>Water Users assessment</td>
<td>Interview of WUA members</td>
<td>Water User groups and farmers in selected schemes</td>
<td>Per irrigation season (during)</td>
<td>Survey Team – Scheme and Community</td>
</tr>
<tr>
<td>Efficiency Assessment</td>
<td>Experiment by the survey team</td>
<td>Selected Schemes</td>
<td>2 times per irrigation season</td>
<td>Sevey Team /Zone Scheme Admin/</td>
</tr>
<tr>
<td>Inspection</td>
<td>Assessment and observation</td>
<td>Woreda and Selected schemes</td>
<td>Annual</td>
<td>Survey Team-Scheme, contract admin, community</td>
</tr>
</tbody>
</table>

Table 5 Team Composition from all OIDA levels

<table>
<thead>
<tr>
<th>Number</th>
<th>Team</th>
<th>Expertise from OIDA</th>
<th>Expertise from zones</th>
<th>Expertise from Districts</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E/ Harargie Team</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1 district expert per scheme</td>
</tr>
<tr>
<td>2</td>
<td>Horoguduru Wollega Team</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>”</td>
</tr>
<tr>
<td>3</td>
<td>Arsi Team</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>”</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>13</td>
<td>3</td>
<td>6</td>
<td>22 Experts from all levels</td>
</tr>
</tbody>
</table>

Each team will be conducting the survey separately, two teams in round one while the third team will go in the 2nd round. All the three teams are unable to go at once due to shortage of vehicles.
13.2 Material Resources

During surveying, each data collector will need to be prepared with the equipment necessary to complete the data collection for the day, such as survey tools, in our case paper, pencils, water efficiency testing supplies like ruler, etc. The survey will also require three vehicles for the three zones as each team will be handling one zone simultaneously.

13.3 Program financing

The duration of the farm survey per each agro ecological zones are not exceeding 7 days. For the four non-farm survey components, the duration will be 5 days for each zone. As both of them will be done by three teams, the total duration will be 12 days in two trips.

Financing for a baseline amounting to be ETB 150,136 will come from OSMIS for the first irrigation season.

*Table 6 Financial Arrangement*

<table>
<thead>
<tr>
<th>Financiers</th>
<th>Amount in Birr for Farm Survey</th>
<th>% share</th>
<th>Amount in Birr for Other Survey</th>
<th>% share</th>
<th>Total Amount In Birr</th>
<th>Total % Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGP OIDA</td>
<td>35,712</td>
<td>42%</td>
<td>25,632</td>
<td>40%</td>
<td>61,344</td>
<td>41%</td>
</tr>
<tr>
<td>OSMIS</td>
<td>50,286</td>
<td>58%</td>
<td>38,506</td>
<td>60%</td>
<td>88,792</td>
<td>59%</td>
</tr>
<tr>
<td>Total</td>
<td>85,998</td>
<td>100%</td>
<td>64,138</td>
<td>100%</td>
<td>150,136</td>
<td>100%</td>
</tr>
</tbody>
</table>

If the survey should be done twice a year, i.e per each of the two irrigation seasons, it has a financial, HR and time implication. Accordingly, the cost will be double i.e. ETB 300,272. The financing for the 2nd irrigation season will depend on the availability of finance. Refer Annex 2 of this document. As per the M&E FW, efficiency assessment will also be done twice each irrigation season which will also require some additional resources.

14. Conclusions

The ultimate aim of collecting M&E data and disseminating M&E results is to achieve the main benefit of the farmers increasing Production and Productivity of Irrigated Agriculture. Effective M&E require honest reflection of the successes and failures of irrigation projects and a willingness to share these results with the wider development sectors. The progressive accumulation of M&E data from irrigation projects will provide an important knowledge resource for guiding implementation, scaling up and improving sustainability. In addition, disseminating lessons learnt from projects that do not achieve their objectives
is as important as highlighting successes. Understanding what does and does not work is essential for the iterative improvement of implementation strategies. In turn, this will greatly increase the likelihood of achieving the goals of irrigation program.
### Annex 1 Survey Schedule

#### Schedule for Farm Survey Tools

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Study duration for each team</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departure to Zones</td>
<td>Departure</td>
<td></td>
</tr>
<tr>
<td>Discussion with Zone + District 1 and travel to the site and identify sample beneficiaries</td>
<td>ZIDA and DIDA 1</td>
<td></td>
</tr>
<tr>
<td>ZIDA and DIDA 1 survey</td>
<td>FS</td>
<td>FS</td>
</tr>
<tr>
<td>Discussion with District 2 and travel to the site and identify sample beneficiaries, FS</td>
<td>DIDA 2 and FS</td>
<td></td>
</tr>
<tr>
<td>Survey</td>
<td></td>
<td>FS</td>
</tr>
<tr>
<td>Departure from zones</td>
<td></td>
<td>Back to Finfinnee</td>
</tr>
</tbody>
</table>

#### Schedule for Other Tools

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Study duration for each team</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departure to Zones</td>
<td>Departure</td>
<td></td>
</tr>
<tr>
<td>Discussion with Zone + District 1 and travel to the site to prepare sample IWAs and schemes</td>
<td>ZIDA and DIDA 1</td>
<td></td>
</tr>
<tr>
<td>ZIDA and DIDA 1 survey</td>
<td>scheme 1 Survey 4 tools</td>
<td></td>
</tr>
<tr>
<td>Discussion with District 2 and travel to the site and do the survey</td>
<td>DIDA 2 &amp; Scheme 2</td>
<td></td>
</tr>
<tr>
<td>Departure from zones</td>
<td></td>
<td>Back to FF</td>
</tr>
</tbody>
</table>

23
## Annex 2 Financial Proposal in two scenarios (Farm Survey and Other surveys)

### Farm Survey Financial Proposal

<table>
<thead>
<tr>
<th>Item</th>
<th>Survey Duration/no</th>
<th>Daily per diem</th>
<th>Incidental-Region</th>
<th>Meals-zone</th>
<th>Persons-Region</th>
<th>Persons-zone</th>
<th>Persons-woreda</th>
<th>Person days-region</th>
<th>Person days -zone</th>
<th>Person days-woreda</th>
<th>Total Expense</th>
</tr>
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<tbody>
<tr>
<td>per diem for PI staff - region</td>
<td>7</td>
<td>300</td>
<td>200</td>
<td>9</td>
<td>7</td>
<td>1,500</td>
<td></td>
<td></td>
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<tr>
<td>per diem for PI staff from -Zone</td>
<td>180</td>
<td>3</td>
<td>5</td>
<td>5,700</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>per diem for PI staff from -Woreda</td>
<td>126</td>
<td>6</td>
<td>2</td>
<td>8,512</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SMIS SMSs allowance including 3 Drivers</td>
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<td>656</td>
<td>4</td>
<td>7</td>
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<td>SMIS Accommodation including 3 drivers</td>
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<td>600</td>
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<td>7</td>
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Total cost for three teams: 85,998
# Other Tools Financial Proposal

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### Annex 3 Team Composition

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<th>Remark</th>
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<td>Planning &amp; Budgeting</td>
<td>Enumerator and Supervisor</td>
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<td>Firaol Muluneh</td>
<td>Irrig. Eng.</td>
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<td>Sheleme Beyera</td>
<td>Extension -OIDA</td>
<td>Agronomist</td>
<td>Enumerator</td>
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<tr>
<td></td>
<td>Dhuguma Megersa</td>
<td>Scheme admin - OIDA</td>
<td>Scheme Maintenance</td>
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<td>M&amp;E</td>
<td>Enumerator and Supervisor</td>
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<td></td>
<td>Girma Abebe</td>
<td>sociologist</td>
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<td>Enumerator</td>
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<td>Tewodros Gebeyehu</td>
<td>Study &amp; Design - OIDA</td>
<td>Economist</td>
<td>Enumerator,</td>
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<td>3</td>
<td>Solomon Bekele</td>
<td>Planning, M&amp;E - OIDA</td>
<td>P,B,M&amp;E</td>
<td>Enumerator and Supervisor</td>
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<td>Dr. Getu Bekere</td>
<td>AGP-OIDA</td>
<td>Sociologist</td>
<td>Enumerator</td>
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<td>Birhanu</td>
<td>Extension OIDA</td>
<td>Horticulturalist</td>
<td>Enumerator</td>
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Annex 4 Data Collection Tools

1. Farm Survey

Code: Farm Survey 2016, ID ______

OROMIA IRRIGATION DEVELOPMENT AUTHORITY

Survey Questionnaire for Irrigation Water User Farmers, 2016

The following survey checklist is a product of joint endeavors by relevant experts from OIDA and SMIS Project. The goal of OIDA is to increase the production and productivity of irrigated crops. It is activities are being implemented in almost all zones with different coverage with a total number of 612 schemes in 18 Zones.

This survey checklist is mainly focused on __________________________ scheme in __________________________ district of __________________________ zone.

In case there is any need of enquiry regarding this survey, please contact the Planning, Budgeting and Monitoring & Evaluation (PB and M & E) department of OIDA through Telephone number: 011 126 2241.

Objective: the main objective of this baseline survey is to gather baseline data for M & E system which is helpful for performance indicators that assist the development of data base for baseline and subsequent management interventions.

Unit of Analysis: In technical terms the unit of analysis is at household level

Sampling method and sample size: It is suggested that the farmer survey sample size for baseline data should be based on the actual capacity of this project.

✓ Proper sampling method should be used as per the need and the nature of the population
✓ The sample size may range from 5 to 20 % of the total population
✓ For the selected sample size 30% should be FHH and the remaining will be MHH, when available.

Remarks
✓ Do not survey any farmers working only on rain fed agriculture within the command area.

✓ Attention should be given to survey both male and female households. If only a male or female farmer is available, take whichever is available. If both male and female farmers are available, choose the female farmer the first time this happens, then a male farmer the next time, alternating to ensure you get a similar proportion of male and female farmers in the overall sample.

✓ Explain to farmers that you work for an irrigation project and you are doing a short survey to improve irrigation performance in Ethiopia.

✓ As a guarantee of confidentiality, tell them that you would like to ask them a short set of questions to help SMIS project broadly understand the environment of the irrigation system in which farmers are targeting.

✓ Tell them that their response will only be used for survey purposes.

✓ Request the farmers (respondents) to provide their honest opinion.

✓ Thank them for their time and suggestions.

Section A: General Data

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<th>Response options code</th>
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<td>A03 Kebele</td>
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<tr>
<td>A04 Scheme</td>
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Section B: Demographic data

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<tr>
<td>B03 Respondent’s age</td>
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<tr>
<td>B04 Respondents education level</td>
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<tr>
<td>B05 Household/ Family Size</td>
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<td>B06</td>
<td>Number of family less than 18 years old</td>
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<td>----------------------------------------</td>
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| B07      | Type of Household                      | 1 = Male Headed /MHH/  
2 = Female headed /FHH/  
3 = Female in male Household /FIMHH/ |
|          | B071 Other                             | _________________ |
| B08      | How many hectares are irrigable under the command area? | _________________ |
| B09      | How much area is currently irrigated?   | _________________ |

**Section C: Yields per ha for each Crops (Indicators B, C, D & 3000c)**

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<th>C01. How many hectare of land Cultivated per crop type per irrigation season in 2015/16</th>
<th>C02. How many hectare of land used for market oriented crops per crop type in 2015/16</th>
<th>C03. How many quintals of irrigated crops yield do you get per crop type per irrigation round in 2015/16</th>
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<td>C02. How many hectare of land used for market oriented crops per crop type in 2015/16</td>
<td>C03. How many quintals of irrigated crops yield do you get per crop type per irrigation round in 2015/16</td>
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Section D: Minimum package and extension service (indicator 3000a)

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**D02.** If yes, please mention the type of technology used per crop type listed below

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<th>Crop</th>
<th>D02. Type of fertilizer used</th>
<th>D03. Amount of fertilizer in kg</th>
<th>D04. types of seeds used</th>
<th>D05. Methods of Irrigation employed</th>
<th>D06. Ploughing frequency</th>
<th>D07. Integrated pest management</th>
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<td>D042</td>
<td>D052</td>
<td>D062</td>
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<td>3</td>
<td>Pepper</td>
<td>D023</td>
<td>D033</td>
<td>D043</td>
<td>D053</td>
<td>D063</td>
<td>B073</td>
</tr>
<tr>
<td>4</td>
<td>Cabbage</td>
<td>D024</td>
<td>D034</td>
<td>D045</td>
<td>D054</td>
<td>D064</td>
<td>B074</td>
</tr>
<tr>
<td>5</td>
<td>Carrot</td>
<td>D025</td>
<td>D035</td>
<td>D046</td>
<td>D055</td>
<td>D065</td>
<td>B075</td>
</tr>
<tr>
<td>6</td>
<td>Onion</td>
<td>D026</td>
<td>D036</td>
<td>D047</td>
<td>D056</td>
<td>D066</td>
<td>B076</td>
</tr>
<tr>
<td>7</td>
<td>Beetroot</td>
<td>D027</td>
<td>D037</td>
<td>D048</td>
<td>D057</td>
<td>D067</td>
<td>B077</td>
</tr>
<tr>
<td>8</td>
<td>Maize</td>
<td>D028</td>
<td>D038</td>
<td>D049</td>
<td>D058</td>
<td>D068</td>
<td>B078</td>
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<tr>
<td>9</td>
<td>Green bean</td>
<td>D029</td>
<td>D039</td>
<td>D0410</td>
<td>D059</td>
<td>D069</td>
<td>B079</td>
</tr>
<tr>
<td>10</td>
<td>Avocado</td>
<td>D0210</td>
<td>D0310</td>
<td>D0411</td>
<td>D0510</td>
<td>D0610</td>
<td>B0710</td>
</tr>
<tr>
<td>11</td>
<td>Papaya</td>
<td>D0211</td>
<td>D0311</td>
<td>D0412</td>
<td>D0511</td>
<td>D0611</td>
<td>B0711</td>
</tr>
<tr>
<td>12</td>
<td>Mango</td>
<td>D0212</td>
<td>D0312</td>
<td>D0413</td>
<td>D0512</td>
<td>D0612</td>
<td>B0712</td>
</tr>
<tr>
<td>13</td>
<td>Apple</td>
<td>D0213</td>
<td>D0313</td>
<td>D0414</td>
<td>D0513</td>
<td>D0613</td>
<td>B0713</td>
</tr>
</tbody>
</table>

1=as recommended minimum  
2=below recommended min.  
3=above recommended in.  
1=improved  
2=local seed  
1=flooding  
2=furrow  
3=basin  
4=Ring  
5=Drip  
1=once  
2=twice  
3=three times  
4=more  
1=used  
2=Not used
D08. Do you get any support from District (Woreda) expert or DA on how to use irrigation technologies (Improved seeds, fertilizer, chemicals and pumps)? (+4200c)

1 = yes  2 = No

D09. If no, why?
_________________________________________________________________

D10. Do you get enough extension services (Improved seeds, fertilizer supply, chemicals, pumps, technical support and experience sharing) on irrigation activities? (Indi. 2000a)

1 = yes  2 = No

D11. If no, why?
_________________________________________________________________

D12. If yes, what is your level of satisfaction with the extension service provided?

1. Very satisfied
2. Satisfied
3. Medium
4. Dissatisfied

D121 If 3 and 4, Why?
_________________________________________________________________

D13. Do you get water lifting device?

1 = Yes  2 = No

D14. If no, Why? ________________________________________________

D15. If yes, what is the level of your satisfaction with the supplied water lifting devices? (Indi. 4200e)

1. Very satisfied
2. Satisfied
3. Medium
4. Dissatisfied

D151 If 3 and 4, Why? ________________________________________________
______________________________________________________________

D16. Do you get enough technical support on installation and the use of water lifting device?

1 = Yes 2 = No

D17. Do you get an advice on selection of market oriented crops? (Ind. 5000a)

1 = Yes 2 = No

D18. If no, why? ____________________________________________

Section E: Water User

E01. Do you get irrigation water according the proposed schedule? (Ind. 1400c)

1 = Yes 2 = No

E02. If no, Why? ________________________________________________

E03. Is the quantity of water enough?

1 = Yes 2 = No

E04. If no, what is the reason?

______________________________________________________________

E05. What is your level of satisfaction on irrigation water supply/schedules? (1400E)

1. Very satisfied
2. Satisfied
3. Neutral
4. Dissatisfied
5. Very Dissatisfied
E051. If 4 and 5, Why?  _____________________________________________________

F. Comments

F1. Other Comments by respondent ____________________________________________

__________________________________________________________________________

We would like to thank you for your time and suggestion. Your information will be kept confidential.

Completed by (enumerator’s name) __________________________ Signature _______ Date_______

Checked and approved by (supervisor name) __________________ Signature _______ date ________
The following survey checklist is a product of joint endeavors by relevant experts from OIDA and SMIS Project. The goal of OIDA is to increase the production and productivity of irrigated crops. It is activities are being implemented in almost all zones with different coverage with a total number of 612 schemes in 18 Zones.

This survey checklist is mainly focused on _________________________ scheme in _______________district of _______________zone.

In case there is any need of enquiry regarding this survey, please contact the Planning, Budgeting and Monitoring & Evaluation (PB and M & E) department of OIDA through Telephone number: 011 126 2241.

Objective: the main objective of this baseline survey is to gather baseline data for M & E system which is helpful for performance indicators that assist the development of data base for baseline and subsequent management interventions.

Unit of Analysis: Water user association level

Instruction:

✓ Interview with IC/ WUA board members/ management
✓ Undertake with 1 scheme per district

Section A: General Data

<table>
<thead>
<tr>
<th>Respondent’s code</th>
<th>Response options code</th>
<th>__________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01 Zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A02 District</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A03 Kebele</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A04 Name of Scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A05 Duration for Interview</td>
<td>______ hr; ______ min</td>
<td></td>
</tr>
</tbody>
</table>
### Section B: Demographic data

<table>
<thead>
<tr>
<th>B01</th>
<th>Name of Respondent</th>
<th>________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>B02</td>
<td>Designation</td>
<td></td>
</tr>
<tr>
<td>B02</td>
<td>Sex 1=Male; 2=Female</td>
<td>________________</td>
</tr>
<tr>
<td>B03</td>
<td>Age</td>
<td>________________</td>
</tr>
<tr>
<td>B04</td>
<td>Name of Respondent</td>
<td>________________</td>
</tr>
<tr>
<td>B05</td>
<td>Designation of</td>
<td></td>
</tr>
<tr>
<td>B06</td>
<td>Sex 1=Male; 2=Female</td>
<td>________________</td>
</tr>
<tr>
<td>B07</td>
<td>Age</td>
<td>________________</td>
</tr>
<tr>
<td>B08</td>
<td>Name of Respondent</td>
<td>________________</td>
</tr>
<tr>
<td>B09</td>
<td>Sex 1=Male; 2=Female</td>
<td>________________</td>
</tr>
<tr>
<td>B10</td>
<td>Age</td>
<td>________________</td>
</tr>
</tbody>
</table>

### Section C: Implementation of Plans (Indicator 1400c)

**C01.** Is the scheme providing water as planned schedule?

1 = Yes  
2 = No

**C02.** If no, why not? ________________________________________________________________

### Section D: Operation & Maintenance (Indicator 1400d)

**D01.** Do you formulate internal rules and regulations for IWUA?

1 = Yes  
2 = No

**D02.** If no, why not?

_____________________________________________________________________________________

**D03.** If yes did the IWUA implement the formulated rules and regulation?

1 = yes  
2 = No

**D04.** If no, why not?

_____________________________________________________________________________________

**D05.** If yes, did you collect the fee as per the Rules & Regulations?
D06. If no, why not? __________________________________________________________________________

D07. Do you have procedures and ways to resolve conflicts on irrigation water distribution?

1 = yes  
2 = No

D08. If no, why not?

____________________________________________________________________________________

D09. Is maintenance procedure carried out under the IC/IWUA responsibility?

1 = Yes  
2 = No

D10. If no, who is responsible?

1=District IDA

2 = OIDA

D101 = others, specify ________________

D11. If yes, do you maintain it timely?

1 = Yes  
2 = No

D12. If no, why not?

____________________________________________________________________________________

D13. Which of the following activates being implemented by IWUA? Tick that apply

1 = Record keeping

1 = Yes  
2 = No

2 = Measuring amount of water supplied

1 = Yes  
2 = No

3 = Operation of water distribution structures (gates)

1 = Yes  
2 = No
4 = Resolving conflicts raised on water distribution
   1 = Yes    2 = No

5 = Operation of pump (in case of water supply from a pump)
   1 = Yes    2 = No

6 = Managing fuel use of the pump, if any
   1 = Yes    2 = No

D15. Do you get any training including O & M?
   1 = Yes    2 = No

D16. If yes do you think that you have got knowledge & skill from the training?
   1 = Yes    2 = No

D17. Do you apply it?

   1 = Yes    2 = No

D18. If no, why not?

E. Comments

E1. Other Comments by respondent

We would like to thank you for your time and suggestion. Your information will be kept confidential.

Completed by (enumerator’s name) Signature Date

Checked and approved by (supervisor name) Signature date
3 Efficiency Assessment Tool

Code: Efficiency Assessment 2016, ID ______

OROMIA IRRIGATION DEVELOPMENT AUTHORITY

Survey Checklist for Efficiency Assessment on SSI Schemes, 2016

The following survey checklist is a product of joint endeavors by relevant experts from OIDA and SMIS Project. The goal of OIDA is to increase the production and productivity of irrigated crops. It is activities are being implemented in almost all zones with different coverage with a total number of 612 schemes in 18 Zones.

This survey checklist is mainly focused on ___________________ scheme in ________________ district of ________________ zone.

In case there is any need of enquiry regarding this survey, please contact the Planning, Budgeting and Monitoring & Evaluation (PB and M & E) department of OIDA through telephone number: 011 126 2241.

Objective: the main objective of this baseline survey is to gather baseline data for M & E system which is helpful for performance indicators that assist the development of data base for baseline and subsequent management interventions.

Unit of Analysis: At scheme level

Instruction: Fill the following questions with ZIDA and DIDA Staff

Section A: General Data

Conduct the assessment

| A01 | Zone          | ________________ |
| A02 | District      | ________________ |
| A03 | Kebele        | ________________ |
| A04 | Scheme        | ________________ |
| A05 | Duration for  | _____ hr, ___ min. |
Section B: Water Conveyance efficiency for main canal and secondary canal (Indicator 1000c)

B01. What is the design capacity of discharge rate of the main canal at the intake (L/S)?

B02. What is the current discharge rate of the main canal at the intake (L/S)/

B03. What is the current discharge at the end of the main canal (L/S)?

B02. What is the current discharge rate of the secondary canal at the inlet (L/S)? (optional)

B03. What is the current discharge at the end of the secondary canal (L/S)? (optional)

Section C: Water Productivity (Ind. 3000b)

<table>
<thead>
<tr>
<th>No.</th>
<th>Crop</th>
<th>C01. Irrigated area (Ha)</th>
<th>C02. Crop Water Requirement. m</th>
<th>C03. Volume of water (m³)</th>
<th>C04. Total production (quintal)</th>
<th>C05. Yield/Volume (C04/C03)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tomato</td>
<td>C011________</td>
<td>C021________</td>
<td>C031________</td>
<td>C041________</td>
<td>C051________</td>
</tr>
<tr>
<td>2</td>
<td>Potato</td>
<td>C012________</td>
<td>C022________</td>
<td>C032________</td>
<td>C042________</td>
<td>C052________</td>
</tr>
<tr>
<td>3</td>
<td>Pepper</td>
<td>C013________</td>
<td>C023________</td>
<td>C033________</td>
<td>C043________</td>
<td>C053________</td>
</tr>
<tr>
<td>4</td>
<td>Cabbage</td>
<td>C014________</td>
<td>C024________</td>
<td>C034________</td>
<td>C044________</td>
<td>C054________</td>
</tr>
<tr>
<td>5</td>
<td>Carrot</td>
<td>C015________</td>
<td>C025________</td>
<td>C035________</td>
<td>C045________</td>
<td>C055________</td>
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<td>C026________</td>
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<td>C056________</td>
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<td>C027________</td>
<td>C037________</td>
<td>C047________</td>
<td>C057________</td>
</tr>
<tr>
<td>8</td>
<td>Maize</td>
<td>C018________</td>
<td>C028________</td>
<td>C038________</td>
<td>C048________</td>
<td>C058________</td>
</tr>
<tr>
<td>9</td>
<td>Green bean</td>
<td>C019________</td>
<td>C029________</td>
<td>C039________</td>
<td>C049________</td>
<td>C059________</td>
</tr>
<tr>
<td>10</td>
<td>Avocado</td>
<td>C0110________</td>
<td>C0210________</td>
<td>C0310________</td>
<td>C0410________</td>
<td>C0510________</td>
</tr>
<tr>
<td>11</td>
<td>Papaya</td>
<td>C0111________</td>
<td>C0211________</td>
<td>C0311________</td>
<td>C0411________</td>
<td>C0511________</td>
</tr>
<tr>
<td>12</td>
<td>Mango</td>
<td>C0112________</td>
<td>C0212________</td>
<td>C0312________</td>
<td>C0412________</td>
<td>C0512________</td>
</tr>
<tr>
<td>13</td>
<td>Apple</td>
<td>C0113________</td>
<td>C0213________</td>
<td>C0313________</td>
<td>C0413________</td>
<td>C0513________</td>
</tr>
</tbody>
</table>

Section D: Comments
D01. Other Comments by enumerator

________________________________________________________________________

Completed by (enumerator’s name) Signature Date

Checked and approved by (supervisor name) Signature date
4. Inspection Assessment Tool

Code: Inspection 2016, ID _______

OROMIA IRRIGATION DEVELOPMENT AUTHORITY

Survey Checklist for Inspection Assessment on SSI Schemes, 2016

The following survey checklist is a product of joint endeavors by relevant experts from OIDA and SMIS Project. The goal of OIDA is to increase the production and productivity of irrigated crops. It is activities are being implemented in almost all zones with different coverage with a total number of 612 schemes in 18 Zones.

This survey checklist is focused on ____________________ scheme in ______________ district of __________________ zone.

In case there is any need of enquiry regarding this survey, please contact the Planning, Budgeting and Monitoring & Evaluation (PB and M & E) department of OIDA through Telephone number: 011 126 2241.

Objective: the main objective of this baseline survey is to gather baseline data for M & E system which is helpful for performance indicators that assist the development of data base for baseline and subsequent management interventions.

Unit of Analysis: At scheme level.

Instruction: Fill the following questions.

Section A: General Data

<table>
<thead>
<tr>
<th>A01</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>A02</td>
<td>District</td>
</tr>
<tr>
<td>A03</td>
<td>Kebele</td>
</tr>
<tr>
<td>A04</td>
<td>Scheme</td>
</tr>
<tr>
<td>A05</td>
<td>Duration for Inspection</td>
</tr>
<tr>
<td>A06</td>
<td>Name, office and position of the respondent</td>
</tr>
</tbody>
</table>

|_____ hrs.: ____min |
Section B: Scheme Quality (indicator 1200b)

B01. Was the scheme design improved?
     1 = yes  2 = No

B02. Was the design amended during construction?
     1 = yes  2 = No

B03. If yes, indicate the main design modified for redesign.
     1. Lined main canal (LMC):
     2. Earthen main canal (EMC)

B031 Others structures, Specify ________________________________

B04. Regarding its hydrology, is the intake opening enough for the design discharge?
     1 = yes  2 = No

B05. If no, why? ________________________________

B06. Was the main canal constructed according to the design?
     1 = yes  2 = No

B07. If no, why? ________________________________

B08. Was the earth canal constructed according to the design?
     1 = yes  2 = No

B09. If no, why? ________________________________

B10. Was their material inspected during construction?
     1 = yes  2 = No

B11. If no, why? ________________________________

B12. If yes, then which material was inspected during construction?
     1. stone
     2. Sand
     3. Cement

B13. Regarding its environmental impact, was the mitigation measures seriously considered?
     1 = Yes  2 = No

B14. If no, why?
     1. On the Headwork ______________________________________________
     2. On the Command area ___________________________________________
3. On the Watershed ________________________________________________

B15. Was the scheme participatory during the following project stages?

1 = Yes  2 = No

B16. If yes, on what stages?

1. Study  
2. Supervision  
3. Construction  
4. Handover

B17. What was the contract period of the project (month)? __________

1. How long it took to be completed (months)? ______

2. Delay in months, if any? ______

B18. If 2, why? ________________________________________________

B19. Regarding its WUA, do you apply water scheduling?

1 = Yes  2 = No

B20. If no, why not? ____________________________________________

B21. If yes, in how many day intervals do you get water? ________________

C. Comments

C1. Other Comments by respondent ______________________________________

________________________________________________________________________

We would like to thank you for your time and suggestion. Your information will be kept confidential.

Completed by (enumerator's name) __________________________ Signature ______ Date ______

Checked and approved by (supervisor name) _________________ Signature ______ date ______
The following survey checklist is a product of joint endeavors by relevant experts from OIDA and SMIS Project. The goal of OIDA is to increase the production and productivity of irrigated crops. It is activities are being implemented in almost all zones with different coverage with a total number of 612 schemes in 18 Zones.

This survey checklist is focused on _________________________ scheme in _________________district of __________________zone.

In case there is any need of enquiry regarding this survey, please contact the Planning, Budgeting and Monitoring & Evaluation (PB and M & E) department of OIDA through Telephone number: 011 126 2241.

**Objective:** the main objective of this baseline survey is to gather baseline data for M & E system which is helpful for performance indicators that assist the development of data base for baseline and subsequent management interventions.

**Instruction:** Fill the following questions with ZIDA and DIDA Staff

---

**Section A: General Data**

Conduct the assessment at the following administrative entities.

<table>
<thead>
<tr>
<th>A01</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>A02</td>
<td>District</td>
</tr>
<tr>
<td>A03</td>
<td>Kebele</td>
</tr>
<tr>
<td>A04</td>
<td>Scheme</td>
</tr>
<tr>
<td>A05</td>
<td>Duration for Inspection</td>
</tr>
<tr>
<td>A06</td>
<td>Name, office and position of the respondent</td>
</tr>
</tbody>
</table>

---

**Section B Verification Assessment**

**(Indicator 1000a)**

**B01.** How old is the scheme?
1 = 0-5 years (New modern)
2 = >5 years (Old modern)

B02. If it is 0-5 years old, what is the total command area of the scheme (ha)?
_________________

B03. Is the scheme providing irrigation water for all the command area?
1 = Yes  
2 = No

B04. If no, estimate the area of the irrigated command area getting water (Ha)?

B05. If no, what are the reasons?
_____________________________________________________________________________________
_____________________________________________________________________________________

B06. If it is greater than 5 years old: What is the total command area of the scheme (ha)?
_________________

B07. Is the scheme providing irrigation water for all the command area?
1 = Yes  
2 = No

B08. If no, estimate the area of the irrigated command area getting water (Ha)?

B09. If no, what are the reasons?
_____________________________________________________________________________________
_____________________________________________________________________________________

(Indicator 1000b)

B09. How old is the scheme (Indicator 1000b?)
1 = 0-5 years (new modern)
2 = >5 years (old modern)

B10. If it is less than 5 years old, does the scheme fully get water?
1 = Yes  
2 = No

B11. If no, what are the reasons?
_____________________________________________________________________________________
_____________________________________________________________________________________
B12. If it is older than 5 years, does the scheme fully get water?

1 = Yes
2 = No

B13. If no, what are the reasons?

C. Comments

C1. Other Comments by respondent

We would like to thank you for your time and suggestion. Your information will be kept confidential.

Completed by (enumerator’s name) Signature Date

Checked and approved by (supervisor name) Signature date
The following survey checklist is a product of joint endeavors by relevant experts from OIDA and SMIS Project. The goal of OIDA is to increase the production and productivity of irrigated crops. Its activities are being implemented in almost all zones with different coverage with a total number of 612 schemes in 18 Zones.

This survey checklist is mainly focused on ______________________ scheme in ______________________ district of ______________________ zone.

In case there is any need of enquiry regarding this survey, please contact the Planning, Budgeting and Monitoring & Evaluation (PB and M & E) department of OIDA through Telephone number: 011 126 2241.

**Objective:** The main objective of this baseline survey is to gather baseline data for M & E system which is helpful for performance indicators that assist the development of data base for baseline and subsequent management interventions.

**Instruction:** Fill the following questions.

1. Name of Zone __________________
2. Name of Woreda ______________
3. Total number of Modern schemes ________, please list them in the following table as required

<table>
<thead>
<tr>
<th>No</th>
<th>Name of Scheme</th>
<th>Name of Kebele</th>
<th>Number of WUA</th>
<th>Land size</th>
<th>Potential Beneficiaries</th>
<th>Actual Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potential</td>
<td>Actual</td>
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<td></td>
<td>MHH</td>
<td>FHH</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>MHH</td>
<td>FHH</td>
</tr>
</tbody>
</table>

|    |                |                |               |           | MHH                    | FHH                 |
|    |                |                |               |           | MHH                    | FHH                 |
|    |                |                |               |           | MHH                    | FHH                 |
4. Amount of Input requested in kg / lit / no.
   a. Improved seeds _________
   b. DAP _________
   c. UREA _________
   d. NPS _________
   e. Agro-Chemicals in lit _________
   f. Pumps _________

5. Amount of Input received in kg and lit
   a. Improved seeds _________
   b. DAP _________
   c. UREA _________
   d. NPS _________
   e. Agro-Chemicals in lit _________
   f. Pumps _________

6. How many times you give training on different topics since 2013 /1005 E.C.? ________,
   please list them in the following table.

<table>
<thead>
<tr>
<th>List of Trainings</th>
<th>No pf participants</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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