# THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA MINISTRY OF AGRICULTURE

# NATURAL RESOURCE SECTOR

# SMALL-SCALE IRRIGATION CAPACITY BUILDING STRATEGY FOR ETHIOPIA

COOPERATION ETHIOPIA GERMANY

Ministry of Agriculture

MASHAV
Israel's Agency for International Development Cooperation
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## STATEMENT FROM THE STATE MINISTER

This Small-Scale Irrigation Capacity Building Strategy formulation is in line with the priority development agenda of the country. Traditional small-scale irrigation development in Ethiopia has a history of antiquity; while "modern" irrigation development was started only in the 1950s' by the commercial irrigated farms established in the Awash Valley through the joint venture of the then Government of Ethiopia and a foreign company. However, the irrigation sub-sector has not yet well developed and thus is not contributing its share to the overall economic development of the country as required. Hence, the Federal Democratic Republic of Ethiopia has given top priority to the irrigation sub-sector in the overall development plans of the country with the ultimate objective of enhancing agricultural production and productivity in general and crop production in particular thereby improving the food security situation. Therefore, this strategy document is a joint output of a trilateral cooperation among the Federal Republic of Germany, the State of Israel through MASHAV – the Centre for International Cooperation and the Government of the Federal Democratic Republic of Ethiopia destined to guide the efforts being made to build the capacity of enhancing irrigated agriculture in Ethiopia.

Irrigation is generally considered as a means of modernizing the country's agricultural economy and is an important investment for improving the rural income through increased agricultural production and productivity. It is also central for reducing the ever increasing pressure on land, especially up in the highlands primarily by increasing the productivity of a unit of land and to some extent by bringing new land under cultivation, particularly in the lowlands where population density is relatively lower and uncultivated land is abundantly available. Moreover, irrigation plays an important role in combating the effects of recurrent droughts and sustains production with efficient and effective use of the available resources; namely, water and land in order to primarily alleviate the problem of food insecurity, improve nutritional status of the rural population and in the long-run to achieve the bigger picture of alleviating poverty. It is through irrigation and integrated crop management that sustainable crop production can be ensured.

This strategy document, which is an output of the joint efforts of all the three parties involved prepared into two parts. The first part discusses the capacity building needs assessment and the constraints identification process undertaken through the course of the joint mission, particularly in the area of small-scale irrigation, where emphasis was given to the overall background of the trilateral cooperation, the objectives of the study, expected outputs, methodologies and approaches followed, overview of the existing relevant policies and strategies of the agriculture and water sectors. In addition, the status of irrigation development in the country has been highlighted. Furthermore, gaps identification and analysis has been captured. Of course, the capacity needs assessment and constrain analysis report is produced as part one in a separate volume. Part two is considered the main strategy document, which discusses introduction and background of the strategy, the main strategic directions and action steps to be taken and detail action plan for the first five years implementation period and resource requirements are indicated.

The first draft strategy document was presented for a stakeholders' workshop and enriched further by the

feedback from the deliberations. Furthermore, a Task Force was further assigned to work to refine the first draft strategy, prepare detail action plan and estimate the resource requirements to put the recommended activities into action. This is, therefore, the amended version of the final strategy document, which is ready for circulation to all parties involved to be used as a long-standing and guiding framework for planning and implementation of capacity building programs in small-scale irrigation development in the country.

Since this is the outcome of a joint effort made by the three parties, we hope that similar efforts and commitments will be relentlessly dedicated for its implementation as well to bring about a sound and momentous change in the area of irrigated agriculture in Ethiopia in a bid to increase its role in the overall economic development of the country and improvement of the livelihood of its people.

Sileshi Getahun

State Minister, Ministry of Agriculture

## ACKNOWLEDGEMENTS

The need for a Small- Scale Irrigation Capacity Building Strategy was conceived in the trilateral cooperation memorandum agreed upon by the higher officials of the Federal Republic of Germany, the State of Israel and the Federal Democratic Republic of Ethiopia for enhancing irrigated agriculture capacity in Ethiopia in the light of the colossal role that the sector plays in the national economic development of the country. Therefore, we would like to extend our sincere appreciations to the higher officials of the three parties involved for taking such an important initiative and committed for its realization.

The preparation of this strategy document is the result of the concerted efforts of all the three parties involved. The capacity needs assessment and the development of the strategy would not have been possible without the contributions of the financial and technical support of GIZ–SLM Program Office of Addis Ababa, Ethiopia and the GIZ Head Quarters and we are grateful for their unfailing assistances. Similarly, the technical support provided by CINADCO-the Centre for International Cooperation for Agricultural Development in organizing the study tour to Israel and active involvement in capacity building needs assessment carried out in Ethiopia was indeed invaluable for which we are quite indebted.. Of course, the overall effective coordination and dedicated efforts of the Ethiopian side for the successful completion of the strategy development is highly appreciated and acknowledged. In particular, we are grateful to the task force members assigned to finalize the strategy; Sorssa Natea (RED&FS SWG), Ermias Birru (GIZ-SLM), Yalew Belete (MoA, AGP), Hussein Kebede (MoA, NRMD) and Aweke Nigatu (MoWE) who worked intensively in revising the situation analysis and worked out in detail the action plan and the resource requirements for implementation of the Strategy.

We would like to thank the respective Heads and Senior Experts of the respective Bureau of Agriculture of Amhara, Tigray, Oromia, SNNPR and Harari Regions for their active participation during the capacity needs assessment and for providing valuable information for the joint mission. We would also thank the Ministry of Water and Energy, Irrigation and Drainage Directorate and International Water Management Institute (IWMI) for providing us with comprehensive information during the briefing sessions held in their respective offices and for supplying supportive materials at the time of capacity needs assessment. We are also grateful to the Melkassa Agricultural Research Centre for their fruitful discussions and for the interesting site visit we made under the guidance of the Agricultural Mechanization Research Unit of the centre.

We are also obliged to extend our heartfelt gratitude to the dedicated efforts and timely decisions made by the officials of all the parties involved for expeditiously supporting the Joint Mission throughout the whole process. We are particularly grateful to Dr. Andrea Balm, former Director of GIZ-SLM Program Coordinating Office of Addis Ababa and Mr. Zvi Herman, Head of CINDACO with the MoARD of the State of Israel and H.E Ambassador Oded Ben-Haim, Embassy of Israel to Ethiopia.

We are also grateful to the members of the Joint Assessment Mission for their efforts and

dedication to come up with concrete proposed strategic directions that could be further taken on board by the prominent stakeholders for implementation in the country. The recommended strategic directions are expected to serve as a long- standing framework to implement successfully and bring a sound change in the area of small- scale irrigation development in Ethiopia.

We are confident that all the parties involved in the development of this strategy document and, of course, all the other stakeholders and development actors who would share the vision contained therein, will exert their utmost efforts in supporting, both financially and technically, the implementation of the proposed strategy to translate it into action.

Sileshi Getahun

State Minister, Ministry of Agriculture

## Acronyms/Abbreviations

| | | |
|---|---|---|
| AED | ► | Agricultural Extension Directorate |
| AGP | ► | Agriculture Growth Programme |
| ATVET | ► | Agricultural Technical Vocational and Educational Training |
| BoA | ► | Bureau of Agriculture |
| BoWE | ► | Bureau of Water and Energy |
| CINADCO | ► | Centre for International Agricultural Development Cooperation |
| DA | ► | Development Agent |
| EIAR | ► | Ethiopian Institute of Agricultural Research |
| FREG | ► | Farmer- Research-Extension Group |
| FYGTP | ► | Five Year Growth and Transformation Plan |
| FTC | ► | Farmers Training Center |
| GDP | ► | Gross Domestic Product |
| GIZ | | German International Cooperation Society |
| GIZ-SLM | ► | German International Cooperation Society- Sustainable Land Management |
| IWMI | ► | International Water Management Institute |
| IWRM | ► | Integrated Water Resource Management |
| MASHAV | ► | Centre for International Cooperation of the State of Israel |
| MoA | ► | Ministry of Agriculture |
| MoWE | ► | Ministry of Water and Energy |
| NGOs | ► | Non- Governmental Organizations |
| NRMD | ► | Natural Resources Management Directorate |
| O&M | ► | Operation and Maintenance |
| PASDEP | ► | Plan for Accelerated and Sustained Development to End Poverty |
| PIF | ► | Policy and Investment Framework |
| RED&FS SWG | ► | Rural Economic Development and Food Security Sector Working Group |
| SD | ► | Strategic Direction |
| SMS | ► | Subject Matter Specialist |
| SNNPR | ► | Southern Nations, Nationalities and Peoples Region |
| SSI | ► | Small-Scale Irrigation |
| WADO | ► | Woreda Agricultural Development Office |
| WUAs | ► | Water Users' Association |

## EXECUTIVE SUMMARY

The overall objective of the Small-Scale Irrigation (SSI) capacity building strategy is to undertake infrastructural, institutional and human resource capacity building which will help the country to optimize the efficient use of water resources with improved land management of small-holder irrigated agriculture development and contribute to improve food security and alleviate poverty. This capacity building strategy is a 15 years road map that guides the government and its development partners address the capacity constraints in order to improve efficiency of smallholders irrigated agriculture. It is aligned with the country's development policies, strategies and the recently launched Growth and Transformation Plan (GTP).

The guiding principles used in this SSI capacity building strategy development are the sound beliefs 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. The guiding principle also include the involvement of relevant stakeholders starting from the inception, planning, implementation and management of small-scale irrigation scheme, ensure environmental responsibilities of beneficiary farmers in irrigated agriculture, maintaining/establishing collaboration and coordinated efforts among key stakeholders, and finally, the assumption is that capacity building is a long-term process that proceeds in a step wise approach through building on what has been achieved.

The SSI capacity building strategy focuses on developing the capacity at different levels in irrigation infrastructure development, water and crop management, institutional capacity, research on irrigated agriculture, input supply and marketing, knowledge management and information system. It will strive to involve beneficiaries starting from the inception through implementation and management of irrigation schemes in a participatory manner, adoption of appropriate technologies, development of practical skills and indigenous knowledge for increased productivity, establishing and strengthening collaboration and coordinated efforts among key stakeholders to enhance irrigated agriculture.

Based on the set of gaps identified during a situation analysis, priority areas of the capacity building strategic directions are identified for sustainable development and implementation of SSI in Ethiopia. Identified strategic directions are presented below in a more summarized manner in order to provide an overview of the identified strategic directions and the subsequent action steps to be undertaken.

Strategic Direction #1: Improve Existing and Develop New Irrigation Infrastructures: The key focuses of this strategic direction are to enhance community participation in SSI planning and implementation; rehabilitate the existing schemes, which are currently deteriorating, due to inappropriate design and lack of proper operation and management; complete those schemes which were started but discontinued for various reasons, and to develop and implement new schemes to expand irrigation infrastructure to areas where there is resource potential and community felt need is secured. This strategic direction maintains integration of watershed development approach as a guiding principle that needs to be followed for SSI development in order to ensure sustainability of the schemes and efficient resources use.

Strategic Direction #2: Strengthen on- farm Irrigation water and Crop Management: The major focus tasks under this strategic direction are improving the capacity of extension services in irrigated agriculture that would enable delivering the required services in a more effective and efficient manner. This includes improving on-farm water and crop management practices and improving farmers' skill in operation and maintenance of irrigation schemes.

Strategic Direction # 3: Establish and Strengthen Appropriate Institutions: Strengthening existing and establishing new institutional and regulatory frameworks is necessary to ensure smooth implementation of the key tasks and responsibilities without creating duplication of efforts. The aim of this endeavor is to put in place/strengthen the appropriate institutional structures at all levels including support services for the proper implementation and management of irrigated agriculture.

Strategic Direction # 4: Strengthen Research on Irrigated Agriculture: Under this strategic direction activities will be undertaken to develop a national research master plan for irrigated agriculture. Subsequently, need based applied researche on irrigated agriculture will be executed. Activities will be directed towards enhancing linkages, strengthening networking and cooperation between national, regional and international research institutes through the establishment of a knowledge management system, establishing documentation centres and information dissemination systems, promotion of on-farm research in partnership with the extension personnel and the local farmers.

Strategic Direction # 5: Strengthen Input Supply, Credit and Marketing System: The existing inputs supply, credit and marketing system are primarily established to serve the rain-fed agriculture. Improved irrigated crops, seed varieties and planting materials, fertilizers, pesticides, fungicides standardized farm tools/equipment will be made available at the nearest location possible to farmers actively engaged in irrigated agriculture. Rural micro-finance institutions and a credit system focused on SSI will be strengthened. A financial instrument such as revolving fund, bank guarantee, etc will be promoted to support resource-poor farmers to assist them in adopting new irrigation technologies. An integrated marketing system between farmers, collection centres (to be established in selected locations) and the market with the involvement of the private sector that will be based on fair deal will be promoted.

Strategic Direction # 6: Establish and Strengthen Knowledge Management and Information System: In Ethiopia the knowledge management system for SSI is not well developed. Under this priority strategic direction knowledge management of SSI will involve the consolidation of data and the development and application of appropriate software tools. Information management on small-scale irrigation in the country is identified as an essential strategic option to provide effective support to the irrigation sub-sector.

# 1. INTRODUCTION

Agriculture is the leading sector of Ethiopia's economy as the overall economic growth of the country largely depends on the agricultural sector. The sector provides employment to 83% of the population, contributed 41.6% to the county's GDP in 2009/10 fiscal year (GTP, 2010) and 85% of its export earnings. Improving the productivity of the agriculture sector can thus undoubtedly benefit both the rural and urban population by providing more food and raw materials at lower prices; generate foreign exchange; provide a growing amount of labor and capital needed for industrialization; and provide market for industrial goods.

Ethiopia has untapped resource bases for agriculture development. The major resource bases for agriculture development are land, diverse agro-ecology, water resources, bio- diversity and human resources. The agriculture sector has promising opportunities to transform itself from subsistence to a level of modern and commercial sector. Nevertheless, the sector faces several challenges to produce adequate food supply for domestic consumption and export earnings. Furthermore, the agriculture sector is largely depends on rainfed production and is dominated by smallholder farming systems.

The annual rainfall pattern of Ethiopia is characterized by spatial and temporal differences. The western part and the central highlands in particular, receive rainfall that is in normal years sufficient for crop production and animal husbandry. Much of the eastern, southern and northern parts of the country very often receive insufficient and/or unpredictable rain. The vast majority (approximately 80%) of Ethiopia's population is concentrated in the highland areas, which in most cases, experiences adequate rainfall during the main season. Thus, in the past, irrigated agriculture as such has not been a priority issue for those particular areas. However, considering the current situation with growing population pressure in the highland areas and a rapidly declining natural resource base has necessitated irrigated agriculture and in line with this irrigation is given prime attention on the country's development agenda.

The irrigation potential of the country is estimated to be about 3.7 million hectares. Of the total potential, until now only about 20 to 23% of this potential is put under irrigated agriculture up until now (both traditional and modern irrigation systems). Recent estimates indicate that the total irrigated area under small-scale irrigation in Ethiopia has reached to 853,000 ha during the last implementation period of PASDEP – 2009/10 and the plan set for development of small-scale irrigation is 1850,000 ha, which is planned to be achieved by the end of the five years GTP of 2015 (GTP, 2010). The existing irrigation development in Ethiopia, as compared to the resources potential that the country has, is not significant and the irrigation sub-sector is not contributing its share accordingly. However, irrigation development is a key to the sustainable and reliable agricultural development, and thus, for the overall economic development of the country. In order to ensure food security at the household level for Ethiopia's fast growing population, smaller, medium and large scale irrigation infrastructure needs to be developed. Such development could also generate externally marketable surpluses in order to earn the required foreign exchange and provide required raw material to the local industries and factories.

The major limitations that constrained the development of the irrigation sub-sector, among

others are: (i) predominantly based on traditional farming systems, (ii) inadequate improved agricultural inputs, (iii) limited access to improved irrigation technologies, (iv) inadequate trained human power, (v) inadequate extension services and capital, (vi) absence of appropriate institutions at different levels responsible for the promotion, planning and development of irrigated agriculture (vii) inadequate information system on agricultural water management and irrigation development.

Irrigation development, particularly in the small holder sub-sector has significant importance raising production and productivity to achieve food self-sufficiency and ensure food security at national level in general and household level in particular. The irrigated agriculture can also play a vital role to supply the required raw materials for domestic agro-industries and increase export earnings. Thus, considering the importance of the irrigation sub-sector in the overall country's development agenda, the Government of Ethiopia gives high priority to irrigation development including smallholder and large scale commercial schemes to exploit the untapped resources.

The Plan for Accelerated and Sustained Development to End Poverty (PASDEP), which was implemented from 2005/06 to 2009/10 gave high emphasis and recorded significant achievements in the development of small-scale irrigation. In the five years GTP strategic directions rolled forward the pivotal role of irrigation development on the basis of solid performance achieved in the previous plan period as well as growing demand for food and industrial raw materials. In the GTP strong emphasis is given to irrigation development and improving water use efficiency in order to improve production and productivity level of irrigated agriculture on a sustainable basis that would contribute to the growth of the agriculture sector. Furthermore, the GTP indicates that emphasis will be given to production of high value crops by taking into account the situation of specific geographic areas, market availability and infrastructures.

In view of the situation analysis and assessment, the recently endorsed Agriculture Sector Policy and Investment Framework (PIF) suggested a strategic review of agricultural water management to accompany the proposed major investments in irrigation development. Given the prominence of irrigation sub-sector in Ethiopia's investment plans, there is also a need to strengthen the planning and design of irrigation schemes, including encouraging community participation at all stages of implementation and integrating irrigation development with environmental impact assessment and to strengthen extension services in irrigated agriculture and strengthen the role and functioning of the Water User Associations (WUAs) in operation and maintenance of irrigation schemes and overall organizational aspects.

Based on the capital intensive nature of irrigation development, with investment costs typically in the range of USD 5,000 to USD 20,000 per hectare, irrigation is likely to account for the largest share of investments under the PIF. The PIF envisions to achieve eight percent annual increase of arable land irrigated and foresees to allocate about thirty-eight percent of the PIF ten years (2010 – 2020) financial Plan, USD 18 Billion. This clearly shows the attention that the Government accorded to the irrigation sub-sector. It is with this vision that this Small-Scale Irrigation Capacity Building Strategy is developed to service as a guiding and long standing framework to be used as a roadmap for small-scale irrigation development in Ethiopia.

Considering the mandate of the MoA in relation to small-scale irrigation and establishing a

common understanding on the scope of this capacity building strategy, it is important to provide a more simplified definition for small-scale irrigation. In this connection, small-scale irrigation is defined as irrigation schemes including traditional and modern, which are owned and managed by smallholders where irrigation water is being supplied and used for irrigation purpose from rivers, ponds, lakes, springs and groundwater sources using different water abstraction techniques and supplied to the irrigation fields using different irrigation methods in order to satisfy crop water requirements. It is applied in an integrated manner with improved crop management practices to increase production and productivity of irrigated crops on sustainable basis.

## 2. RATIONALE

Ethiopia has great potential of fertile agricultural land, untapped water resource, varied climatic conditions and rich biodiversity suitable for diverse agricultural activities to ensure food self-sufficiency, supply adequate raw materials to domestic factories and industries and increase export earnings. Despite, these potential resources available, agriculture has remained underdeveloped and recurrent drought has become a common phenomenon, which has compelled the country to depend on foreign food aid.

Irrigation is one of the potential means to modernize Ethiopia's agriculture based subsistence economy dominated by smallholder farmers. However, the irrigation subsector is confronted with different constraints and challenges. These include inadequate resources (financial, human and logistical), technical know-how (skill & research information) and a management system.

The existing irrigation development in Ethiopia, as compared to the resources the country has, is not significant. In order to ensure food security at household level for the fast growing population of the country the irrigation potential has to be developed to ensure optimum productivity of irrigated agriculture. Such development could also generate externally marketable surpluses that could contribute to earn the required foreign exchange and provide required raw materials to the local industries. To this effect, the situation calls for the unreserved dedication and commitment of the relevant institutions to work towards creating enabling environment for the planning and implementation of efficient and sustainable irrigation system.

Thus, in order for SSI to effectively perform its part and succeed in adequately serving its overriding objectives, the SSI development needs to follow a well-planned and coordinated process. Such a planned move, in turn, requires a thorough analysis of the prevailing constraints, setting priorities and systematically plan the actions directed to realistically achieve the set objectives with respect to the available resources and implementation capacity. It is therefore, essential to determine the what, how and when aspects of the SSI development tasks and set its priorities on the basis of the existing internal and external situations. This requires undergoing a process of envisioning SSI's future as well as setting clear goals and realistic objectives with a defined timeframe for their attainment. Such a process involves a strategic planning exercise by which major stakeholders determine their roles and set the outstanding procedures and modalities of operation to achieve the desired results.

Thus, the purpose of the strategic planning exercise is to enable the leadership, constituency and major stakeholders to undertake a process of determining what priority and essential tasks have to be performed. The overriding rationale of SSI capacity building strategic document is to lay the roadmap for the small holder subsector how to contribute to the achievement of increased productivity of the sub-sector and achieve food security.

## 3. SCOPE OF THE STRATEGY

This Small- Scale Irrigation Capacity Building Strategy encompasses the creation of enabling environments by putting in place a conducive policy environment and regulatory frameworks, institutional development, and enhancing technical capacity and capability of professionals and the community. Community participation and involvement in sharing responsibilities for efficient management of irrigation schemes is identified as a critical element in SSI development in order to improve and the sustain production and productivity of irrigated agriculture to contribute positively to the growth of the agriculture sector.

This capacity building strategy is mainly focusing on developing institutional capacity, including human resource development to deliver effective and efficient support services, irrigation infrastructure development, improving technical capacity and capability of professionals at all levels and beneficiary farmers actively engaged in irrigated agriculture, particularly giving emphasis to smallholders and private investors engaged in small-scale irrigated agriculture.

# 4. SMALL-SCALE IRRIGATION CAPACITY BUILDING STRATEGY

## 4.1 Vision

By the year 2025, small- scale irrigation in Ethiopia will be modernized, commercialized and will sustain optimum productivity and profitability with sustainable natural resources management.

## 4.2 Mission

Promote small-scale irrigation development on a sustainable basis through developing efficient irrigation infrastructure and agricultural water management, establishing and strengthening of appropriate institutions and building the technical capacity and capability of the irrigation sub- sector. This could be achieved using improved and appropriate irrigation technologies and efficient services to transform the existing subsistence farming system into a more efficient, market- oriented and profitable production system.

## 4.3 Objective

### 4.3.1 Overall objective

The overall objective of the SSI capacity building strategy is to lay down a road map that would ensure irrigation water availability and access to smallholder farmers for increased production and productivity of irrigated agriculture.

### 4.3.2 Specific objectives

The specific objectives of small-scale irrigation capacity building strategy are to:

- Improve the technical and institutional capacity, expand infrastructure for SSI and create appropriate institutions at all levels to deliver more effective and efficient services;
- Increase production and productivity of irrigated agriculture to ensure food security, supply adequate raw materials to domestic factories and industries and increase export earnings,
- Improve institutional linkages and sustain effective coordination between key stakeholders,
- Strengthen the input supply schemes and market information systems in order to improve access for quality inputs and improve value chain to ensure profitability of irrigation sub-sector and
- Encourage the participation of private sector in the development and management of SSI.

## 5. GUIDING PRINCIPLES

The basic principles of SSI Capacity Building Strategy pertaining to the national water strategy are:

- Water is a natural endowment, commonly owned and its fair distribution shall be exercised;
- SSI development shall be based on participatory approach and integrated framework;
- The participation of all stakeholders particularly user communities and women's will be promoted in the relevant aspects of water resources management;
- Irrigation in general, should be integrated with maintaining environmental sustainability and
- Capacity building is a long-term process that builds on what has been achieved.

# 6. PRIORITY ISSUES ADDRESSED BY THE STRATEGIC DIRECTIONS

In practical terms, the capacity building strategy can address only some issues among the many categories that constrain the performance of the SSI. Within the planning timeframe of fifteen years, considering implementation capacity and limited resources it is highly important to focus on key critical areas.

On the basis of the situation analysis and the capacity needs assessment conducted, six strategic directions are identified that will help to systematically address the gaps and build the capacity to promote SSI. These strategic directions are interrelated and provide broad framework of the SSI sub-sector. Under each strategic direction action steps are laid which will guide the implementation of the strategic directions. The identified strategic directions and actions steps are discussed hereunder in detail.

## 6.1 Strategic Directions

### SD#1. Improve Existing and Develop New Irrigation Infrastructures

**Purpose:** *Upgrade existing and develop new SSI infrastructures to ensure irrigation water supply*

The key focuses of this strategic direction are to assess resource potential to SSI and to enhance community participation in SSI planning and implementation; rehabilitate the existing schemes suffering from inappropriate design and lack of proper operation and management; complete construction of ongoing schemes which were started sometimes back but discontinued for various reasons, and to initiate and develop new schemes to expand irrigation infrastructures to where there is resource potential and community felt need is secured. In addition, in this strategic direction potential assessment of small-scale irrigation will be given, due attention.

Moreover, this strategic direction will facilitate that proper attention is given to integrate planning in the development and implementation of irrigation scheme by adopting watershed based development approach in studying and implementing irrigation schemes and will guarantee the complimentarity of irrigation development schemes with other allied sectors' activities such as watershed management and agricultural practices, livestock farming system, hydropower generation and potable water supply schemes.

The surface water resource potential of the country still remains the main source of irrigation water supply for small-scale irrigation development. But in areas where surface water resource is limited and rainfall is inadequate to ensure crop production of high value crops, the development of groundwater resource and water harvesting , particularly in drought-prone areas of the country will be considered as potential sources for supplementary means of irrigation. Due attentions will be given to upgrade the skill of farmers, technicians and professionals to adopt the best practice of in SSI implementation. Necessary provision and support will be given to the private sector involvement in SSI development.

Technical guidelines and standards will be developed for scheme planning, implementation and promoting of appropriate irrigation technologies to ensure irrigation water supply and improve water use efficiency through application of improved on-farm water and crop management practices. The guidelines and standard procedures to be prepared will be upgraded and improved periodically based on field experiences during implementation and results of new research findings.

### SD#2. Strengthen on- farm Irrigation Water and Crop Management

**Purpose:** *Sustain improved on-farm irrigation water and crop management to increase productivity and production of irrigated agriculture*

In most areas of the country, existing small-scale irrigation infrastructures are not being managed as effectively and efficiently as they are supposed to be and the scheme performance is low and unprofitable. Therefore, the major focus areas under this strategic direction are improving the capacity of extension services in irrigated agriculture, which includes improving on-farm water and crop management and improving farmers' know-how and practical skills in operation and maintenance of irrigation systems.

Furthermore, other activities set under this priority area include developing guidelines for scheme operation and maintenance, demonstrating affordable and improved irrigation technologies, and engaging private sector in scheme operation and maintenance. Most importantly necessary attention will be accorded to strengthening WUAs in organizational aspects and scheme management. In addition, the sustainability of SSI through regular assessment will be given, due attention. To this effect, standard SSI scheme performance assessment will be developed and applied by taking into consideration the country context.

### SD# 3. Establish and Strengthen Appropriate Institutions

**Purpose:** *Set up appropriate institutions for effective planning and implementation of irrigation initiatives*

Strengthening existing and establishing new institutional and regulatory frameworks is necessary at different levels by undertaking an assessment of the existing institutional capacities with respect to the regulatory and implementation roles and responsibilities of institutions at all levels. The aim of this endeavor is to develop the appropriate institutional structures in undertaking effective and efficient implementation and management of the irrigated agriculture. Duties will be streamlined and overlaps of duties and responsibilities among institutions within the sector will be avoided as much as possible.

Establishing and/or strengthening of Water Users Associations (WUAs) is identified as a critical element to effectively and efficiently manage irrigation schemes. Providing proper guidelines to WUAs in order to undertake O&M activities properly and making them fully responsible for all aspects scheme management is essential. Therefore, establishing/strengthening of WUAs is identified as one of the focus areas included under this strategic direction for proper management of small-scale irrigation infrastructures.

As part of institutional issues, identifying of appropriate centres for providing short-term practical in-service training activities in the area of irrigation will be given emphasis to improve practical skills of technicians.

### SD# 4. Strengthen Research on Irrigated Agriculture

**Purpose:** *Generate affordable and appropriate technologies to improve productivity of irrigated agriculture*

Under this strategic direction activities will be undertaken to develop a national research master plan for irrigated agriculture. Subsequently, need based applied research on irrigated agriculture will be executed in different agro-ecological zones of the country where irrigation potential exists. The main focus areas of research will be developing and selecting appropriate crop varieties suitable for irrigation regime, determining improved irrigation water management and crop management practices including soil fertility management aspects under irrigation condition and developing post-harvest technologies.

Activities will be directed towards enhancing linkages between research, extension service and farmers. Furthermore, emphasis will be given to strengthen networking and cooperation between national, regional and international research institutes through the establishment of a knowledge management system, documentation and information dissemination systems, promotion of on-farm research in partnership with the extension personnel and the local farmers.

### SD# 5. Strengthen Improved Input Supply, Credit and Marketing Systems

**Purpose:** *Improve access to financial provision, input supplies and market facilities for better adoption of improved irrigation technologies and to create better market opportunities*

Support services for SSI such as input supply, credit and marketing systems are virtually absent. The existing support services are primarily established to serve the rain-fed agriculture. Various activities will be undertaken under this strategic direction to address the gaps and fulfil SSI beneficiary farmers need.

Improved irrigated crops seed varieties and planting materials, fertilizers, pesticides, fungicides standardized quality farm tools/equipment will be made available to farmers at the nearest location possible. Technical service centres (for maintenance of irrigation pumps, farm tools, irrigation equipments, supply of spare parts, farm equipment rental services) will be established in selected and more appropriate locations to provide the required services nearby. The private sector will be encouraged and supported in seed multiplication, processing, packaging and supply of seeds of high value crops and technical services.

Rural micro-finance institutions and a credit system focused on SSI will be strengthened. A financial instrument such as revolving fund mechanism will be put in place for resource-poor farmers to assist them to adopt new irrigation technologies and applied other recommended agricultural inputs accordingly in their respective fields.

Integrated marketing systems between farmers, collection centres and the main market with the involvement of the private sector that will be based on fair deal need to be promoted to support farmers to get fair prices for their produce and increase their income in order to improve their living standard. In particular, emphasis will be given to provide the required technical assistance and facilitate financial provision to establish horticultural crop collection centres linked to national and international market outlets with the facilities of integrated cold chain, value addition and packaging centres and preservation infrastructure schemes with the necessary

components. This will significantly promote the market oriented production system that will maximize farmers' benefit and improve supply of fresh produce to the market.

Therefore, establishing of integrated cold chain, value addition and packaging centres and preservation infrastructure schemes with the required components will then be essential and needs to be given prime attention. Strong linkage can be established between these centres and the local farmers in providing training activities, supplying of inputs, support in field inspection, sorting, packaging and properly leveling of agricultural produces in order to maintain quality produce for better market value.

### SD# 6. Establish and Strengthen Knowledge Management and Information System

**Purpose:** *Improve easy access to up- to- date information to all users for better planning and efficient management of irrigated agriculture*

In Ethiopia a knowledge management system for SSI practically does not exist. Under this strategic direction knowledge management of irrigation will involve data collection, processing, storing and dissemination of consolidated information or data and the development and application of appropriate software tools.

Information management on irrigation in the country is identified as an essential strategic option to support the on- farm objectives of effective irrigation operation. It is recognized that farmers, field level technicians and irrigation professionals require a coordinated approach to irrigation information management. It is also recognized that while some information is available, the data is fragmented, at different scales across the country, requires different levels of interpretation to be useful, and is often out of date and is not accessible to end users and decision makers. A detailed implementation plan for a Knowledge Management System for SSI will be subsequently developed. Need based software tools will be developed around the key information systems which make up the knowledge management for irrigation. In addition, identification and formulation the best management practices in irrigation development will be given emphasis.

## 6.2 Strategic Directions and Action Steps

Under each strategic direction action steps are presented in brief as follows.

### SD#1: Improve existing and develop new irrigation infrastructures

a) Conduct water resource assessment and mapping for small-scale irrigation development

b) Ensure community participation in scheme planning and implementation through awareness creation and providing the necessary guidelines.

c) Integrate watershed management approach into irrigation planning, design and implementation

d) Improve the capacity of professionals in irrigation scheme planning, design and implementation

e) Develop guidelines and standard procedures for scheme planning, design and implementation, including procedures for environmental issues and ground water exploration

f) Encourage private sectors involvement in irrigation development and supply of technologies

g) Enhance knowledge and skill of farmers in the use of labor intensive irrigation technologies

h) Upgrade and rehabilitate existing small-scale irrigation schemes for their optimum performance

i) Complete ongoing schemes, which were started but discontinued for various reasons

j) Develop and implement new small-scale irrigation schemes

k) Develop regulation & guideline for water use rights between upstream and downstream users

l) Develop standards and technical guideline for irrigation pumps selection, operation & maintenance

m) Develop know-how and practical skills of smallholders in promoting low cost and appropriate household irrigation technologies (HIT), including household water harvesting structures

### SD#2: Strengthen on- farm irrigation water and crop management

a) Improve capacity of extension services in irrigated agriculture with particular emphasis to high value crops

b) Enhance knowledge and skills of farmers in operation and maintenance and crop management

c) Develop technical guidelines for scheme operation* and maintenance

d) Demonstrate improved and affordable irrigation technologies

e) Encourage private sectors engagement in irrigation scheme operation and maintenance

f) Strengthen capacity of WUAs' in organizational aspects and scheme management

g) Develop and establish standardized scheme performance assessment guideline

### SD# 3: Establish and strengthen appropriate institutions

a) Setup appropriate institutions responsible for irrigated agriculture

b) Improve human resource development through long-term training in irrigated agriculture

c) Put in place the legal framework for the establishment and functioning of WUAs
   - Lobby for putting in place rule and regulation for WUAs'
   - Prepare regulation, submit and follow up for its endorsement
   - Ensure implementation of WUAs' regulation
   - Establish/strengthen WUAs' for efficient scheme management and administration

d) Establish support services /centres for maintenance of irrigation pumps, farm tools and equipment

e) Develop regulation and guideline for equitable and efficient use of irrigated land

f) Encourage establishment of low cost specialized well drilling institutions

### SD# 4: Strengthen research on irrigated agriculture

a) Develop national research master plan for irrigated agriculture
   - Identify outstanding researchable issues

b) Plan and implement need- based applied researches on irrigated agriculture
   - develop affordable and appropriate irrigation technologies

c) Strengthen research-extension-farmers linkage

### SD# 5: Strengthen input supply, credit and marketing system

a) Establish and strengthen input supply, credit and marketing support services

b) Develop appropriate guidelines and incentives for provision of irrigation inputs for smallholders

c) Establish and/or strengthen cooperatives to ensure input delivery and marketing systems

d) Encourage contract farming and out growers to transfer technologies and sustain production

e) Strengthen support for promotion of post- harvest technologies

f) Establish integrated cold chain, value addition & packaging centres & preservation infrastructures

g) Establish multiplication centers for improved seeds/planting materials of high value crops

h) Encourage PPP in irrigation technology and other inputs multiplication and distribution

i) Promote private sector investment in agribusiness processing plants and market linkages

j) Provide support to private and public sectors to encourage their participation in irrigated agriculture (acquiring heavy machineries, irrigation technologies/pumps, farm equipment, etc)

k) Develop standard procurement procedures and guidelines for irrigation technologies/pumps

l) Develop & implement a price stabilization mechanism to protect producers against market risks.

**SD# 6: Establish and strengthen knowledge management and information system**

a) Develop and strengthen knowledge and information management capacities to improve the adequacy, reliability, and accessibility of existing databases at all levels

b) Establish database management system on agricultural water management

c) Identify, document and disseminate best practices on appropriate and affordable irrigation technologies including indigenous knowledge for expansion of irrigated agriculture

d) Establish standard M&E system to monitor and evaluate performance of irrigated agriculture

e) Establish inter-sectoral coordination, linkages and networking/experience sharing events

## 7. ACTION PLAN

The Small-Scale Irrigation Capacity Building Strategy sets a road map on how to develop and effectively manage the water resources at smallholders' level to increase production and productivity of smallholders irrigated agriculture in particular and to contribute to the growth of the agriculture sector in general. This will ultimately ensure food-self sufficiency and contribute to achieve the national economic development objectives. In the detailed action plan it is indicated that implementation of the most important actions and measures are given priorities to be implemented in the short-term period, which are then carried over to the next phases-medium and long-term objectives. Achieving of long-term development objectives is not a one-time shot, but it should be viewed as a result of a continuous process that is to be built and strengthened overtime on the achievements of short and medium-term implementation efforts. The success or failure of the actions and measures in the short-term determines what should be done next–whether implementation of actions should continue, or how the scope and direction of measures should be adjusted and/or additional measures should be considered.

Accordingly, the implementation of the strategic directions proposed in this capacity building strategy need to be viewed as a process aiming to achieve long-term objectives by implementing the recommended actions in a more sequential manner building on the lessons and experiences gained. Therefore, the action plan shows the detailed actions to be undertaken in the short-term (within the 3-5 years), medium (5-10 years) and long-term (10-15 years) of implementation periods. Successful implementation of these measures in the short-term will secure a necessary basis for the implementation of more complex measures in the medium and long-term implementation periods. However, it is important to note that the action steps recommended under the six strategic directions to be implemented in the short, medium and long-term implementation periods are expected to be implemented in a more integrated manner and they can start simultaneously to achieve the long-term development objectives of the country, increase production and productivity of the agriculture sector that would contribute to the overall economic development of the country. This strategy needs to be implemented in a more integrated and coordinated manner with the allied sectors.

The expected result is an increase or an improvement in planning, design and management of SSI in technical competency, coordination and communication, as well as in the capacity of target groups to engage in increasing agricultural productivity and marketing.

The SSI capacity building strategy is designed for fifteen years, which is expected to be effective from January 01, 2012 to 2025. It is expected that this plan will be reviewed and revised during implementation.

# DETAIL ACTION PLAN

The total budget required for implementation of the proposed action plan for the coming 5 years' is estimated to be ETB 226,508,700,000.00 (two hundred twenty six billion five eight million seven hundred thousand). Overall, the total budget required for the fifteen years implementation period is estimated at ETB 815,431,320,000 (ETB eight hundred fifteen billion four hundred thirty one million three hundred twenty thousand), which is equivalent to 47,966,548,235 USD (forty seven billion nine hundred sixty six million five hundred forty eight thousand two hundred thirty five USD). The estimate of resource requirements for the subsequent implementation periods is expected to be worked out considering the specific situations of the time.

*Table 1. Detail action plan prepared for implementation of the proposed strategic directions and action steps*

| No. | Strategies | Action steps | Indicator | Targets | Timeframe/ deadline | 5 years Indicative Budget (Birr) '000,000 | Responsible |
|---|---|---|---|---|---|---|---|
| 1 | Improve existing and develop new irrigation infrastructures | Conduct water resource assessment and mapping (surface and ground water) | # of study documents | 2 | 2011 - 2013 | 200 | MoA, BoA, MoWE, BoWE and WADO |
| | | Ensure community participation in scheme planning, design and implementation | % of community involvement in scheme development and management | 95 | 2011 - 2016 | No cost implication | MoA, BoA, MoWE, BoWE and WADO |
| | | • Create awareness | # of events conducted for awareness creation | Minimum 5 events/scheme | 2012 - 2013 | 8.5 | MoA, BoA, MoWE, BoWE and WADO |
| | | • Develop guideline for community cost sharing mechanism in scheme development, | # of guideline developed | 1 | 2011 - 2016 | 3.5 | MoA, MoWE, BoA, BoWE and WADO |
| | | • Ensure community cost sharing mechanism in scheme development and management | % of schemes developed and managed with community cost sharing | 80 | 2011 - 2013 | No cost implication | MoA, BoA, MoWE, BoWE and WADO |
| | | Integrate watershed management approach into irrigation planning, implementation & management | • # of watersheds treated in integration to development of SSI schemes | 95 | 2011 - 2016 | 1,500.0 | MoA, BoA, MoWE, BoWE and WADO |
| | Improve existing and develop new irrigation infrastructures | Improve the capacity of professionals in planning, design and implementation of SSI schemes | • # of professionals trained | 3500 | 2011 - 2016 | 2,615 | MoA (NRMD, Agriculture Extension Directorate) |
| | | | • %age of scheme under good management | 90 | | | |
| | | Develop guidelines and standards procedures for scheme planning, design and implementation, including procedures for appropriate environmental issues and ground water management | # of guidelines developed | 5 | 2011 - 2016 | 7.0 | MoA (NRMD, Agriculture Extension Directorate) and .BoWRE and BoA) |
| | | Develop guideline for water use rights between upstream and downstream users | # of guidelines developed | 1 | 2011 - 2016 | 2.0 | MoA and MoWE |
| | | Develop guideline for sustainable ground water management | # of guideline developed | 1 | 2011 - 2016 | 0.5 | MoA and MoWE, |
| | | Upgrade and rehabilitate the existing SSI Scheme for optimum performance | # of rehabilitated schemes | 150 (100) | 2011 - 2016 | 6700 | MoA (NRMD, Agriculture Extension Directorate) and .BoWE and BoA) |
| | | Complete ongoing irrigation schemes | # of completed schemes | 200 | 2011 - 2016 | 13125 | MoA (NRMD, Agriculture Extension Directorate) and .BoWE and BoA) |
| | | Develop and implement new irrigation schemes | Hectare of developed schemes | 1000,000 | 2011 - 2016 | 200,000 | MoA (NRMD, Agriculture Extension Directorate) and .BoWE and BoA) |
| | | Encourage Private sector in irrigation scheme development and supply of technologies | % of schemes designed and implemented by private sector | 50 | 2011 - 2016 | No cost implication | MoA, BoA and BoWE |

| No. | Strategies | Action steps | Indicator | Targets | Timeframe/ deadline | 5 years Indicative Budget (Birr) '000,000 | Responsible |
|---|---|---|---|---|---|---|---|
| | Improve existing and develop new irrigation infrastructures | Enhance knowledge and skills of farmers in the use of labour intensive technologies | % age of farmers adopted labour intensive technologies | 80 | 2011-2016 | 510 | MoA (NRMD, AED), MoWE, .BoWE and BoA) |
| | | Develop standards and technical guideline for irrigation pumps selection, operation and maintenance | # of developed guideline | 1 | 2012-2013 | 0.5 | MoA (NRMD, AED), MoWE, .BoWE and BoA) |
| | | Develop know-how and practical skills of smallholders in promoting low cost and appropriate household irrigation technologies | • # of trained farmers<br>• % of adopted technologies | 200,000<br>50 | 2011 - 2016 | 500 | MoA (NRMD, AED), MoWE, .BoWE and BoA) |
| 2 | Strengthen on-farm irrigation water and crop management | Improve capacity of extension services in irrigated agriculture | • % age of scheme under good management<br>• # of farmers received extension service | 75 | 2012-2016 | 43 | MoA (NRMD, Agriculture Extension Directorate) |
| | | Enhance on- farm water and crop management practices with particular emphasis to high value crops | % age of SSI schemes fully functioning | 80 | 2011-2016 | 17 | MoA (NRMD, Agriculture Extension Directorate) and .BoWE and BoA) |
| | | Enhance knowledge and skills of farmers in operation and maintenance | • % of farmers adopted recommended on-farm water and crop management practices | 80 | 2011-2016 | 510 | MoA (NRMD, Agriculture Extension Directorate) and .BoWE and BoA) |
| | | Develop technical guideline for scheme operation and maintenance | # of guideline developed | 1 | 2011-2016 | 4.5 | MoA (NRMD, Agriculture Extension Directorate) and .BoWE and BoA) |
| | | Demonstrate improved and affordable irrigation technologies | # of demonstrated and adapted technologies | 25 | 2011-2016 | 3.5 | MoA and MoWE |
| | Strengthen on-farm irrigation water and crop management | Strengthen capacity of WUA's in organization and scheme management | % age of well functioning WUA.s' | 100 | 2011-2016 | 3.5 | MoA (NRMD, AED, Coop Agency) and .BoWE and BoA) |
| | | Develop and establish standardized scheme performance assessment guideline | # of guideline developed | 1 | 2012 - 2013 | 8.5 | MoA (NRMD, AED), MoWE, .BoWE and BoA) |
| | | Engage private sector in irrigation system operation and maintenance | % of schemes operated and maintained by private sector | 50 | 2011-2016 | No cost implication | MoA , BoA and BoWE |
| 3 | Establish and strengthen appropriate institutions | Setup appropriate institutions responsible for irrigated agriculture | # of institutions established | At all level | 2011-2016 | 1.0 | MoA, BoA and BoWE |
| | | • Lobby and prepare proposals for the required institutional setup | # of proposals prepared | 12 | 2011-2016 | 3.0 | MoA, BoA and BoWE |
| | | Improve existing human resource development through long-term training in irrigated agriculture | # of professionals trained | 250 | 2011-2016 | 87.5 | MoA, BoA and BoWE |
| | | Encourage establishment of low cost specialized well drilling institutions | # of established drilling institutions | 100 | 2012 -2016 | 10 | MoA, BoA and BoWE |
| | | Establish support service providing centres for maintenance of irrigation pumps, farm tools and equipment | # of established support service providing centres | 50 | 2012 -2016 | 5 | MoA, BoA and BoWE |
| | | • Lobby for putting in place regulation for WUAs' | # of brief meeting with concerned officials | 22 | 2012 - 2013 | 1.0 | MoA, Coop Agency, BoA and BoWE |
| | | • Prepare draft regulation, submit and follow up for its endorsement | # of regulations prepared and endorsed | 11 | 2012 - 2013 | 3.0 | MoA, Coop Agency, BoA and BoWE |
| | Establish and strengthen appropriate institutions | • Ensure implementation of the WUAs regulation | # number of familiarization events conducted | 11 | 2012 - 2013 | 1.0 | MoA, Coop Agency, BoA and BoWE |
| | | • Establish and/or strengthen the WUAs | % of established and/or strengthened WUAs | 100 | 2011-2016 | 3.5 | MoA, Coop Agency, BoA and BoWE |
| | | Develop regulation and guideline for fair and efficient use of irrigated land | # of guideline developed | 1 | 2012 - 2013 | 3.5 | |

| No. | Strategies | Action steps | Indicator | Targets | Timeframe/ deadline | 5 years Indicative Budget (Birr) '000,000 | Responsible |
|---|---|---|---|---|---|---|---|
| 4 | Strengthen research on irrigated agriculture | Develop national research master plan for irrigated agriculture | # of developed research master plan | 1 | 2011-2016 | 2.5 | MoA, EIAR, BoA and Regional Research Centres |
| | | Plan and implement need based applied researches on irrigated agriculture | # of conducted research programmes | 50 | 2011-2016 | 170.0 | EIAR, Regional Research Centres |
| | | • develop affordable and appropriate irrigation technologies | # of initiated and implemented activities | | 2011 - 2016 | 8.5 | EIAR, Regional Research Centres |
| | | Improve research-extension –farmers' linkage | ➢ # of disseminated technologies<br>➢ # of need-based researches conducted | 25 | 2011 - 2016 | 8.5 | MoA, EIAR, BoA and Regional Research Centres |
| 5 | Strengthen inputs supply, credit and marketing system | Establish and/or strengthen cooperative to ensure input delivery and marketing | % of established /strengthened cooperatives | 100 | 2011 - 2016 | 5.0 | MoA, Coop. Agency, BoA and WADO |
| | | Link farmers engaged in irrigated farming in input supply and marketing channels | % of cooperatives linked with input marketing channels | 100 | 2011 - 2016 | 4.5 | It is merged with the above activity |
| | | Strengthen support for post-harvest technologies | # of constructed facilities/ centers | 100 | 2011 - 2016 | 300.0 | MoA, Coop. Agency, BoA and WADO |
| | | Establish integrated cold chain, value addition and packaging centers and preservation infrastructures | # of constructed facilities/ centers | 5 | 2011 - 2016 | 50 | MoA, Coop. Agency, BoA and WADO |
| | Strengthen inputs supply, credit and marketing system | Establish and strengthen input supply, credit and marketing support services | Amount of credit provided<br># of farmers gained access to improved irrigation technologies as | | 2011 - 2016 | 4.25 | MoA, Coop. Agency, BoA and WADO |
| | | Encourage PPP in irrigation technology and other inputs multiplication and distribution | # of private sectors involved<br># public enterprises involved | | 2011 - 2016 | 2.5 | MoA and BoA |
| | | Develop appropriate credit guideline for provision of irrigation inputs | # of guideline developed | 1 | 2012 – 2013 | 1.7 | MoA, Coop. Agency, BoA and WADO |
| | | Encourage contract farming and out growers to sustain the marketing system | # of farmers engaged in contract farming | | 2012 - 2016 | 2.5 | BoA, BoWE and WADO |
| | | Promote private sector investment in agribusiness processing plants and market linkages | # of established agribusiness centers | 50 | 2012 - 2016 | 5 | BoA, BoWE and WADO |
| | | Provide support to private and public sectors to encourage their participation in irrigated agriculture | # of institutions received the required support | 150 | 2012 - 2016 | 5 | BoA, BoWE and WADO |
| | | Develop standard procurement procedures and guidelines for irrigation technologies/pumps | # of guideline developed | 1 | 2012 - 2013 | 5 | BoA, BoWE and WADO |
| | | Develop and implement a price stabilization mechanism to protect the producers against market risks | • # of developed market facilities<br>• # of developed policy support | | 2012 - 2016 | | BoA, BoWE and WADO |
| 6 | Establish and strengthen knowledge management and info system | Establish database management system on agricultural water management | # of collected and documented data<br># of established data management system | | 2012 - 2013 | 25.5 | MoA, BoA, MoWE, BoWE and WADO |
| | Establish and strengthen knowledge management and information system | Identify, document and disseminate best practices (appropriate and affordable irrigation technologies including indigenous knowledge) in irrigated agriculture | # of documents produced and distributed | 5 | 2011 - 2016 | 8.5 | MoA, BoA and WADO |
| | | Establish standard M & E system to monitor and evaluate performance of irrigated agriculture | # of prepared standard M&E system | 1 | 2011 - 2013 | 4.25 | MoA, BoA, MoWE, BoWE and WADO |
| | | Establish inter-sectoral coordination, linkages and networking/experience sharing events among stakeholders | # of established networking<br># experience sharing events conducted | | 2011 - 2016 | 15.0 | MoA, BoA, MoWE, BoWE and WADO |