

# Design, implementation and sustainability of Japanese development cooperation in Ethiopia: A study of selected cases

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## **Abstract**

*This research examines the design, implementation, and sustainability of Japanese development cooperation projects in Ethiopia. Key case studies include the Alemgena Training and Testing Centre's role in heavy machinery training, the Ethiopian Water Technology Institute's support for water sector education and technology transfer, and Japanese-backed rice sector development supported by Japan's development cooperation. These efforts have strengthened Ethiopia's capacity in human resources, infrastructure, and institutional development, advancing goals such as self-reliance and self-sufficiency. Success is attributed to Japan's targeted approach, long-term strategic planning, and comprehensive interventions, ensuring sustainable and impactful development outcomes. The key success factors can serve as a lesson for other development partners in adapting the project design approaches and implementation modalities for sustainable impact of development cooperation.*

**Keywords:** *Development cooperation, sustainable development, project design, Ethiopia, JICA/Japan*

## **Introduction**

Development cooperation in the form of assistance to promote economic growth has been considered important globally, given the success of the USA's Marshall Plan, which provided aid to European allies to rebuild their economies and promote future growth in the 1950s after the destruction of WWII. The plan targeted the stimulation of

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European production, the promotion of the adoption of policies that lead to stable economies, and measures to increase trade among European countries and between Europe and the rest of the world (CRS, 2018). Later on, this type of foreign assistance was renamed as Official Development Assistance (ODA) to indicate government aid designed to promote economic development and the welfare of developing countries, with a significant change in the approach considering the own economic, foreign policy and other interests (OECD, 2022a; Klingebiel, 2014).

The effect of foreign aid on growth has been the subject of debate, where scholars from both recipient and donor countries often see its role either positively and try to frame it as development cooperation (Chaturvedi et al., 2021; Kishor and Bhattarai, 2013; Petermann, 2012), or negatively and consider it as a cause of underdevelopment in the recipient countries (Adams and Ellassal, 2020; Dambisa, 2009)

Ethiopia is among the major recipient countries of ODA from different countries, including Japan. Japan is among the major global donors, which has contributed a total of \$17.63 billion in 2021 (OECD, 2022b). Recognising the role of international cooperation to tackle global issues, including the entry into force of the Paris Agreement and adoption of the Sustainable Development Goals (SDGs), Japan has revised its development cooperation charter and laid out its development cooperation to cover (i) countering the challenges against the international order, (ii) responding to economic and social vulnerability, (iii) addressing growing complexity and severity of global issues related to poverty reduction, health, climate change, environment, humanitarian assistance, fragile countries and segments (MoFA, 2024, 2023). Japan's development assistance to Ethiopia is generally channelled through the Japan International Cooperation Agency (JICA), which has been operational in Ethiopia since 1993. JICA is an implementing body of the Japanese government's Official Development Assistance (ODA). JICA's cooperation in Ethiopia is primarily focused on (i) agriculture and rural development, (ii) industrial promotion, (iii) infrastructure development and (iv) education. In general, JICA provides the ODA as bilateral aid in the form of Technical Cooperation, Japanese ODA Loans and Grant Aid (MoFA, 2024; Yasunaga et al., 2024).

The main objective of this research is to document the approach followed along with the extent of contribution of the Japan ODA to Ethiopia in addressing systemic challenges for economic growth by building domestic capacity to sustainable development based on selected three JICA projects. The rationale for this research is to generate a comprehensive understanding of key lessons in development cooperation across the full project cycle—from design to implementation, as key lessons for effectiveness, coordination, ownership, and sustainability in development cooperation.

## **Methodology**

### **Overall approach and scope**

Japanese development cooperation in Ethiopia is primarily implemented through the Japan International Cooperation Agency (JICA) under the framework of bilateral agreements between the Government of Japan—through its embassy—and the Government of Ethiopia. To examine how these cooperation projects are designed and implemented to ensure sustainable impact, this study adopts a two-tiered analytical approach. First, it assesses the general procedures and modalities followed across the project cycle, from design to implementation. Second, it presents an in-depth analysis of selected projects implemented over time, examining their different phases to generate detailed insights into effectiveness and sustainability.

### **Selection of case studies (projects)**

The case studies (sample projects) were selected considering the availability of data, the time of implementation, where we considered the cases to cover trends over time, and the targeting of different economic sectors. Accordingly, three projects that have been implemented since the early 2000s were selected as cases for the study. These are:

- a) Project for building the domestic capacity of heavy-duty machine operation, implemented together with the Ethiopian Ministry of Transport, from 2002 to 2006.
- b) Ethiopian Water Technology Centre Project implemented with the Ministry of Water and Energy, which has become Ethiopian Water Technology Institute by the Council of Ministers

Regulation No. 293/2013. The project was implemented in four phases: Phase I (1998 - 2003), Phase II (2005 - 2008), Phase III (2009 - 2014), and Phase IV (2017 - 2023);

- c) Grant aid for the establishment of the National Rice Research and Training Center and the Project for Functional Enhancement of the National Rice Research and Training Center (Ethio-Rice Project), implemented together with the Ethiopian Institute of Agricultural Research (EIAR). Grant aid (2013), Phase I (2015 – 2020), and Phase II (2020 – 2025).

### **Data collection and analysis**

The required data generation heavily depended on desk review of (i) Japan ODA policy documents, and (ii) review of project documents, i.e. project proposals, progress reports and final reports. The data generated from the desk review was complemented with Key informant interviews (KIIs) with experts in respective partner implementing ministries and offices and the authors' experience in JICA project implementation. The data generated were then synthesised using qualitative analysis.

### **Results and discussion**

#### **JICA approaches in project design and implementation: overview Design of a high-level country assistance program**

Japan's ODA to Ethiopia dates back to 1967, when it provided "technical cooperation assistance" to the then Imperial Central Institute of Public Health. With the opening of the JICA Ethiopia office in 1993, the ODA expanded to road rehabilitation and maintenance and groundwater development in addition to food aid and debt relief (Table 1).

With increased ODA, the identification of support areas has been through detailed policy consultation through an "Annual Ethio-Japan Policy Dialogue". The first policy consultation was held in 1997 to identify priority areas for aid. Since 2003, local policy consultations have been held annually, leading to policy consistency, alignment and respect for ownership (Izumi, 2008). Since the late 2000s, there is a shift in emphasis from poverty reduction and human security to economic growth and private investment in aid projects to Ethiopia as outlined in the ODA Development Cooperation and the Tokyo International Conference on African Development (TICAD), with an

increased consideration of Kaizen approach, investment climate improvement, and agricultural value chain in Ethiopia since 2009 (MoFA, 2025).

Table 1 presents the number of development projects under implementation by identified cooperative programs and emphasis by sector, presented in the proportion of financial aid allocated in Ethiopia.

Table 1 Projects underway in Ethiopia (as of April 2019)<sup>1</sup>

Focus Areas (% of resource allocated)	Cooperative Programs	Number of projects
Agriculture and Rural Development (12.8%)	Rural market	2
	Improved agricultural productivity and stability	8
Industrial promotion (53.7%)	Industrial development	10
Diversification and efficiency of power sources (10.4%)	Stable power supply	4
Transportation and Urban Infrastructure Development (3.3)	Transportation and urban infrastructure development	5
Improving access to safe water and urban sanitation measures (10.5)	Improved access to safe water and urban satellite measures	8
Improving education (9.1%)	Industrial human resource development	4
Health (0.1%)	Health	2
<b>Total</b>		<b>43</b>

*Source: Prepared by the authors based on the Ministry of Foreign Affairs Business Development Plan for the Federal Democratic Republic of Ethiopia.*

The development assistance to Ethiopia is framed through the Country Assistance Plan (CAP), which is often designed for five years. The main modalities of ODA from Japan are (i) grant aid and loan aid, namely loan for development in developing regions; (ii) technical cooperation; and (iii) contributions and subscriptions to multilateral institutions.

Once the CAP is designed within the ODA for each country, then JICA takes the responsibility of implementing it in the respective target countries.

Under the Ethiopian context, the Ethio-Japan Economic cooperation policy dialogues are annually organised with the objectives of alignment of the Japanese Country Assistance programs with Ethiopian government demands, assessment of the status of programs and projects under implementation and addressing emerging challenges in the implementation process. The annual policy dialogues are held at the Ethiopian Ministry of Finance, chaired by the State Minister for Economic Cooperation, in the presence of the Ambassador of Japan, the country director of JICA, JICA senior experts and representatives of project implementing partners.

The following section presents the approaches applied in project design, implementation, and follow-up, drawing on evidence from a desk review and key informant interviews (KIIs) with project experts, complemented by the authors' practical experience in project implementation and based on the evidence from the target three JICA projects.

### **Project design**

The key principle of project design for development assistance is pragmatism and the concrete 'how' of learning, i.e., how developing countries can enhance policy and societal capacity to learn external knowledge and technology and adapt them to the local context (MoFA, 2025; Izumi et al., 2023). This, in practice, implies consideration of diverse dimensions in the project design, including the potential alignment with global and/or continental Japanese development assistance initiatives like the UN SDGs, Tokyo International Conference on African Development (TICAD) and Coalition for African Rice Development (CARD).

As per MoFA (2024), Key informants and the authors' experience, the specific steps in the project design, as depicted in Figure 1, consider the following main steps. The first steps target a proper understanding of the challenges and opportunities within the thematic area of a project by deploying an assessment team (high-level expert mission) with the

required professional background and expertise from Japan. This is also linked with ensuring alignment with government programs, like the Growth and Transformation Programs (GTPs) and other development partner-supported programs and projects like the Ethiopian Food System Resilience Program -EFSRP (Embassy of Japan in Ethiopia, 2019). The second step covers a validation of the identified intervention areas of a project through sequential consultations with relevant stakeholders in the country. The crucial step in the third step, where sequencing of interventions is made considering the needed long-term contribution and impact that covers the three aspects, namely (i) technological innovations, (ii) human capacity, and (iii) physical infrastructure as key inputs for project proposal drafting covering Project Design Matrix (PDM) and Plan of Operation (PO) for the project. The fourth step is the identification of a relevant hosting public organisation for ensuring mainstreaming and sustainability of the project interventions. The final step is the identification of required Japanese expertise for effective implementation of the project intervention, which is followed by the approval of the project document during the Annual Ethio-Japan Policy Dialogues, often hosted by the Ethiopian Ministry of Finance. Once the project is approved, the official signing of the agreement by the representatives of the two governments is followed. Before the end of implementation, there is an end-evaluation made by Japanese experts with the main target of documenting the achievements and exploring a recommendation for a potential follow-up project (Figure 1).

The above-stated activities are undertaken by a high-level mission of Japanese experts. The mission undertakes a series of consultations with local experts from relevant organizations and prepares two project proposal documents: (i) Project Design Matrix /PDM/ and (ii) Plan of Operation /PO/ for the project (JICA, 2015). The PDM clearly presents the overall goal, purpose, outputs and activities of the project with clear and objectively verifiable indicators, their means of verification and associated important assumptions. Linked with the PDM, the PO provides a detailed list of activities by output along with responsible implementers for each quarter of a year covering the project life time, which is often five years.

The uniqueness of the project design process is aimed at achieving a long-term target of systemic changes. It is often the case, as it is documented in this article, that projects include introduction and/or local development of innovations (physical, procedure, policy), human capacity development, and required infrastructure development.

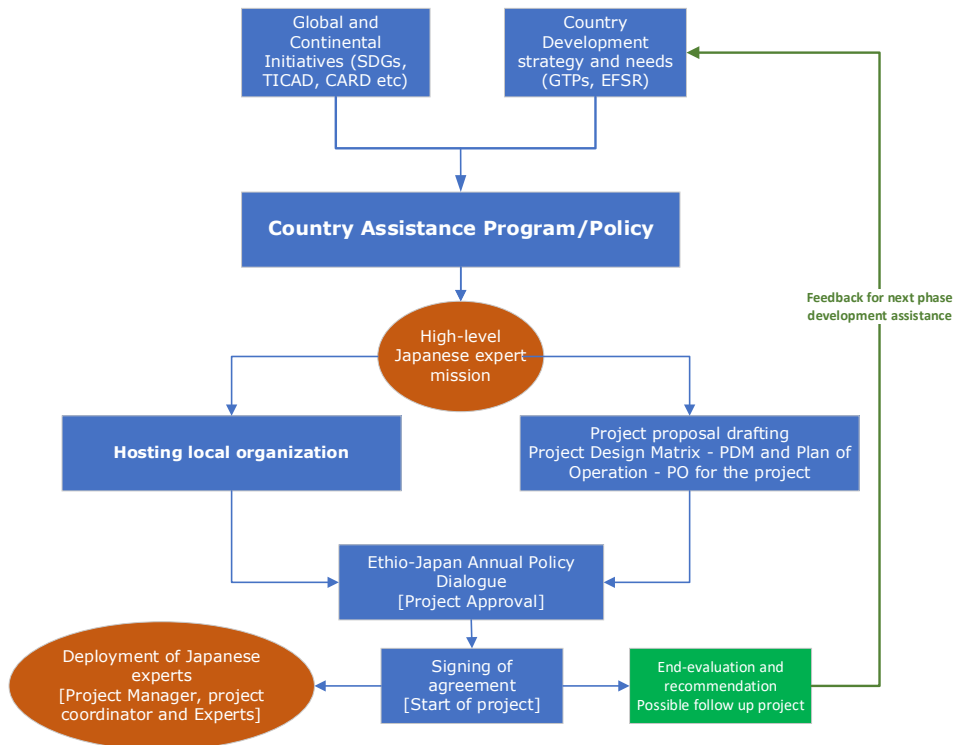


Figure 2 Project design process

Source: Own schematic presentation based on MOFA (2002), JICA (2020); MoFA (2024) and authors' experience

### Project implementation

The approaches in project implementation generally follow unique processes in terms of project management, planning, consideration of local human capacity development, and mechanisms to ensure sustainability (JICA, 2015; MOFA, 2002, MoFA, 2008; and Authors' experience, as presented below:

- **Project management:** once a project is approved, its implementation is managed by both the Japanese Chief Advisor and the local project manager, who take the overall responsibility of project implementation with the support of the Japanese project coordinator. The project coordinator's responsibility is financial management, considering the local and Japanese financial regulations. The local project manager is often a seconded staff member from the hosting organization, who is expected to ensure mainstreaming into the system of different innovations within the hosting organization.
- **Annual Project activity planning:** the PDM and PO documents provide the project implementation framework, allowing the planning of activities in an agile manner every year. Once the project team together with experts from the hosting organization drafts each year's annual plan of activities, the planned activities are further discussed and evaluated mainly to ensure (i) ownership among relevant stakeholders, (ii) alignment with ongoing initiatives, and (iii) timely adjustments considering prevailing dynamism of opportunities and challenges at annual Joint Coordinating Committee (JCC) meetings. JCC meetings are often attended by higher officials, relevant stakeholders from both national and regional organizations, and senior experts from JICA.
- **Mainstreaming local human capacity building:** the capacity building aspects of Japanese projects are generally need-based and aligned with what the project requires for sustainability and cover almost all types of capacity building including (i) on-job training using local or international expertise, (ii) short-term training locally or abroad, and (iii) long term postgraduate level training at local universities or abroad mainly in Japan (at masters and doctoral levels).
- **Focus on ensuring sustainability:** This aspect often considers (i) adequate investments in required infrastructure, including as a model, (ii) investments in institution building linked with construction of facilities and buildings, and/or (iii) exploring business incubation.

### **Follow-up project design**

Japan's development assistance projects are designed for five-year phases, considering a clear sequencing of types of interventions and

follow-up projects as presented below, based on the three case projects and the ODA approach of the government of Japan (MoFA, 2002). As it is indicated below in the case of selected projects, the initial phase often starts with the required infrastructure development, followed by facilitating the functionality of the developed infrastructure, along with interventions to ensure sustainability, like capacity development and building institutions with Ethiopian government approval.

### **Impacts of JICA projects**

The impact indicators considered are more on the contribution to domestic human capacity development through skill transfer, institutional innovation, and suitability of the different dimensions of interventions, considering the three case studies (projects).

### **Project for capacity building of the Ethiopian Roads Authority Training and Testing Center at Alemgena**

#### **Background**

The Alemgena Training and Testing Center (ATTC) of the Ethiopian Roads Authority (ERA), located 18 km west of Addis Ababa, was established in 1956 in order to upgrade the skill level of those engaged in the construction and maintenance of roads in the country. However, given the limited investments for improving the road sector and the demand for qualified professionals, the ATTC was not in a position to fulfil its mission (RSDP Advisory office, 2000). Accordingly, the Ethiopian government requested (when?) the Government of Japan for technical cooperation to support ATTC.

With due consideration of (i) the official request from the Ethiopian government, (ii) the recognition to the dire road condition in the country, (iii) the Ethiopian government's priority given to the road sector improvement in the national development and poverty reduction strategies, and (iv) the stated needs in the Road Sector Development Program (RSDP) for the 1997-2007 period, the project was initiated by the Japanese government within its development assistance to Ethiopia. Accordingly, a Japanese preliminary study team organized by JICA visited the country in 2000 and drafted a four-year project (2002 – 2006) on capacity building of the ERA Training and Testing Center at Alemgena with the overall objective of enabling the ATTC to provide training in sufficient quantity and quality in the field of construction

equipment operation, construction equipment maintenance, and road construction and maintenance through (i) transfer of management know-how, (ii) preparation of teaching materials, (iii) development of curriculum along with a teaching system, (iv) ToT for ATTC instructors, (v) enhancing availability of equipment relevant for the provision of the training, and (vi) provision of training courses (PDM document, and JICA, 2006)

The project was implemented from April 2002 - 31 March 2006 by JICA with the Ethiopian Roads Authority as the hosting organization and the Ministry of Land, Infrastructure, Transport and Tourism of Japan as the supporting Organization. The Project Design Matrix (PDM) of clearly indicates the roles and responsibilities of these organizations in the implementation process (JICA, 2000).

In order to guide effective implementation of the project, concretization of the planned outputs and associated activities identified by the Japanese expert mission into relevant and need-based specific activities, the project had made a need assessment along with a baseline survey (ATTC, 2002). This survey was instrumental in designing the training program, considering the needs of the public-owned Ethiopian Roads Authority and the Rural Roads authorities of the regional states of Ethiopia, and also from private construction companies.

### **Project components**

For the achievement of the stated objectives, the project had the following key components:

#### **Dispatching long and short-term Japanese experts**

The long-term experts dispatched included (i) chief advisor, responsible for the overall management of the project, (ii) project coordinator, responsible for the project finance and logistics, (iii) construction equipment operation expert, (iv) construction equipment maintenance expert, and (v) road maintenance expert. The short-term Japanese experts were dispatched on a need basis, and a total of seven experts were engaged specializing mainly in the areas of soil and asphalt testing, component diagnosis, workshop management, welding, and electrical engineering (JICA, 2006).

### Training of counterpart personnel in Japan

These trainees are personnel who are involved in the project and employees of the ATTC, and their number is determined annually through need assessments through discussion of both parties (Table 1).

### Provision of required equipment

The type and number of equipment to be procured by the project were determined through a needs assessment. Accordingly, 19 types of equipment were provided to ATTC, including bulldozers, motor graders, wheel loaders, excavators, vibration and tyre rollers, dump and flatbed trucks, asphalt distributors and tip spreaders, crane trucks, and equipment for maintenance and laboratory (JICA 2006).

### Project impact

The project impact can be assessed considering its direct and indirect contributions. In terms of the direct impact, the project has built the capacity of ATTC, where the number of trainees increased from 68 persons per annum in the first year of the Project to 664 in the final year of the Project, with a total of 3,312 trainees over six years, with specializations for machine operation, craftsmanship and civil engineering (Table 2). This created improved availability of well-trained experts in the country, who can operate and maintain contemporary road construction and maintenance equipment.

Table 2 Number of trainees by specialization (2002/03 – 2007/08)

Implementation year	Specialization			Total
	Machine Operation	Craftsmanship	Civil Engineering	
2002/03	48	20	0	68
2003/04	205	91	19	315
2004/05	175	201	174	550
2005/06	418	183	63	664
2006/07	911	56	55	1022
2007/08	437	179	77	693
<b>Total</b>	<b>2194</b>	<b>730</b>	<b>388</b>	<b>3312</b>

Note: The project was implemented from 2002/03 – 2007/08 (JICA, 2008)

The indirect impact was also reported to be the establishment of private heavy-duty machine operation and maintenance centers across the country by those who were trained in Japan and at ATTC (JICA, 2008), which creates a spill-over effect related to the availability of training facilities in nearby locations across the country.

As a result of both the direct and indirect impacts of the project, the country's dependence on imported expertise for road construction and maintenance equipment operation and maintenance was considerably reduced, as the local availability of well-trained operators and maintainers has considerably increased with improved access to training facilities across the country.

### **Ethiopian Water Technology Institute (EWTI)**

Ethiopia has issued a Water Resources Management, Protection and Utilisation Proclamation with a target of putting the water resources to the highest social and economic benefit for its people through appropriate protection and due management (FDRE, 2000). However, the water supply rate in Ethiopia in 1998 was extremely low, estimated at 19% of the national average, 11.5% in agricultural villages compared with the 41% average of sub-Saharan African countries in 1998 (JICA, 2013). The key challenge reported was the lack of skilled manpower related to (i) groundwater investigation, (ii) drilling technology operation, (iii) drilling machinery maintenance, (iv) water supply management, and (v) operation and maintenance of mechanical and electrical equipment for water supply.

Recognising the importance of developing the country's water resources along with the main challenge related to making available required and qualified human resources, the Japanese government engaged with the Ethiopian government through JICA to develop skilled manpower by implementing four phases of capacity development projects from 1998 to 2024. In all phases of the projects, the key components were (i) development of local institutions to ensure sustainability of human resource development, (ii) availing required technological innovations, and (iii) deployment of professional experts to ensure required skill and knowledge transfer (Table 3). The four phases were implemented as JICA's technical Cooperation Projects with Japanese government grant aid (JICA, 2024).

Table 3 Different phases of JICA's technical Cooperation Projects on groundwater and water supply development (1998 – 2024)

Project title	Period	Main contents of cooperation
Groundwater Development and Water Supply Training Project (EWTEC1)	January 1998 – January 2005	Develop government staff involved in groundwater development and water supply programs to ensure the provision of adequate and safe water. Key activities included strengthening the Groundwater Development and Water Supply Training Center, developing training courses, and managing a model site.
Groundwater Development and Water Supply Training Project Phase-II (EWTEC2)	March 2005 – March 2013	Developed the functions of the existing training center further. The major activities included expanding the training center's functions and achieving full-scale operation, implementing diverse training courses to develop human resources and enhance the management capabilities of center staff, conducting research and development activities to develop and improve training and materials, and formulate appropriate technology dissemination plans, launching training programs for African countries (third-country training), utilizing the model site for training, and strengthening collaboration with similar projects implemented in Ethiopia under grant aid programs.
Ethiopian Water Technology Center Project Phase-III (EWTEC3)	January 2009 – December 2013	Supported EWTEC (Ethiopian Water Technology Center) to meet diverse training needs. Main activities included support for EWTEC's self-reliance and functional enhancement, and

		improvement of training courses through training evaluations, development of an external lecturer database, etc.
Project for strengthening capacity for training operation and management for the Ethiopian Water Technology Institute (EWTI)	June 2017 – August 2024	In 2013, the Ethiopian Water Technology Center (EWTEC) was upgraded to the Ethiopian Water Technology Institute (EWTI). The objective was to strengthen the training operations and management system of the institution and enable EWTI to sustainably implement human resource development in the water sector.

Source: JICA, 2024, project evaluation reports of the four phases.

### **Institutional development**

The establishment of the Ethiopian Water Technology Centre was the initial target of investment to ensure the provision of formal training in groundwater development and water supply management in Ethiopia under the project entitled Groundwater Development and Water Supply Training project (1998 – 2003, with extension up until 2005). Specifically, the project had three main components, which were related with (i) establishment of the Water Technology Training Centre in Addis Ababa with required facilities (equipment and materials) along with technologies, related knowledge and curriculum for training; (ii) development of model areas (construction of water supply facilities at model districts) for groundwater development and management to ensure practical training and developing a learning cycle to accumulate the experiences in sustainable rural water supply development and management process (JICA, 2024)

Due to the need to further strengthen the role of the centre, during the third phase of the project (2009 – 2013), the centre was upgraded to the Ethiopian Water Technology Institute with wider roles and responsibilities set by the Council of Ministers Regulation No. 293/2013 as a core national training centre for water supply technicians and engineers of Ethiopia with specific engagements in the areas of (i) supporting the water sector Education and Training, (ii) Research and

Technology Transfer, (iii) provision of specialized laboratory Service, and (iv) support to Technical and Vocational Education and Training institutes (TVETs) (JICA, 2024)

### **Training and research technological support**

EWTEC as the first training organization established in 1998, not linked with formal education system (upgraded to the Ethiopia Water Technology Institute – EWTI in 2013) in the fields of groundwater development and water supply in the country, it provides five basic training courses, namely (i) groundwater investigation (GWI), (ii) well drilling technology ((DT), (iii) Drilling Machinery Maintenance Technology (DMMT), (iv) Electro Mechanical Maintenance Technology (EMMT), and (v) Water Supply Engineering (WSE) (JICA, 2024)

To ensure the availability of trained local experts for the centre, 13 counterpart Ethiopian experts participated in short-term training in the 1<sup>st</sup> phase of the project in Japan in the areas of training management, community development, mechanical machine maintenance, capacity development of rural women, vocational training administration, water resource development, drilling technology and waterworks engineering (JICA, 2003) Through the centre, a total of 711 engineers from regional governments and drilling institutes were trained through the project period, and EWTEC successfully became the sole training institute in the water sector (JICA, 2024).

### **Deployment of professional experts**

The experts have been dispatched from Japan over several phases with a wide range of specialisations, including groundwater development, drilling technology, electrical and mechanical equipment maintenance, water supply system design, water supply management, community development, gender, training management, curriculum/materials development, and teaching methodology. The experts were dispatched as long-term (a total of seven in the first phase, and 17 in the 3<sup>rd</sup> phase) and short-term experts. The long-term experts' role has been ensuring the seamless implementation of the project-planned activities covering both management and technical issues, while the role of short-term experts was to provide specific technical training in the diverse areas of water technology (JICA, 2024, 2003).

### **Equipment provision**

As part of the project, considerable investment was made in the provision of required training facilities and machinery in the range of 21 to 38 million Ethiopian Birr per phase, which includes well-drilling machines, exploration equipment, water quality measuring devices, computers, audiovisual equipment, books, and vehicles (Terminal evaluation reports of each phase). These investments were made over the different phases, considering the need for the provision of relevant training.

The Japanese development cooperation through JICA in facilitating the development of local capacity and infrastructure, Ethiopian Water Technology Institute, was established by the Council of Ministers Regulation No. 293/2013 as a centre of excellence with a focus on water sector capacity building and research and technology transferring activities in August. The institute plays a critical role in building the capacity of experts from the regional water bureaus, town water supply services, zonal water resources offices, woreda water offices, water works construction enterprises, water works design and supervision enterprises, and private actors. This has resulted in developing national capacity where there are over 1000 private actors engaged in water and sanitation in addition to the federal and regional public enterprises (Defere, 2015).

### **NRRTC and Ethio-rice projects**

Though rice in Ethiopia is a recent introduction, it has recently become one of the priority commodities in the country. The key driver for receiving its current importance has been the considerable support from development partners since the introduction of its value chain development (Alemu et al., 2019; Alemu and Thompson, 2020). With several attempts to promote rice in different parts of the country, well established commercial rice production especially under small-scale farmers condition started in the Fogera plain since early 1984 through a project entitled “Ethio-Jigna Development Project” where a team of nine North Korean agriculture experts came to the area, with the objective of promoting rice and horticultural crops (Tadesse et al., 2018). With the technical support of those North Korean experts, rice research was initiated in Jigna (Dera woreda) and Shaga (Fogera

woreda) cooperatives and the popular X-Jigna rice variety was introduced to the area.

The importance of rice in terms of production expansion and increasing trend in domestic consumption since its introduction in the 1970s is strongly associated with several key factors: (1) the existence of suitable agro-ecologies and the quest of successive governments to address food insecurity and improve agricultural production; (2) the compatibility of rice with local farming systems and traditional foods, especially with the preparation of 'injera' (traditional flat bread); (3) the economic incentives for its production related mainly to higher productivity in relation to better unit prices versus other cereal crops; (4) the emergence of processors acting as pull factors for rice commercialisation; (5) government concerns about increasing rice imports to meet rising consumer demand, which has put pressure on scarce foreign currency reserves; and (6) the favourable public policy environment and support of international development partners to promote research and development (R&D) efforts to increase rice production (Alemu and Thompson, 2020). Even though the domestic production is expanding, the rate of increase in the consumption has been very high that has forced the country to spend its meagre foreign currency revenue on rice import reaching about 700 million USD (Alemu, et al., 2021).

In line with JICA's strategic support in promoting rice sector development in Africa through the framework of the Coalition for African Rice Development (CARD), JICA recognized the potential of the rice sector in Ethiopia and started to support the country in drafting a national Rice Research and Development Strategy in 2008, which the Ethiopian government approved in 2010 (MoARD, 2010). The strategy clearly identified (i) the potential the country has, (ii) the key challenges, and (iii) what needs to be done if the country is to benefit from rice sector development.

JICA's role in Ethiopian rice sector development are related with (i) supporting the design and revision of the National Rice Research and Development Strategy since 2008, (ii) investment in the construction of the National Rice Research and Training Centre, and (iii) facilitating the full operationalization of the centre as a national centre of

excellence, and (iv) human resource development through deployment of Japanese experts and through short and long-term training of Ethiopian experts (Shiratori et al., 2019).

### **National rice sector development strategy**

The support for the design of the National Rice Sector Development emanated from the CARD initiative, and the engagement with the MoA in Ethiopia started in 2008. With the support of CARD, an international Japan-based NGO, SG2000 facilitated the design of the strategy, where a national rice sector development taskforce was established, composed of experts from MoA, EIAR, and SG2000, that took the responsibility of drafting the strategy. CARD experts were engaged in backstopping and benchmarking experiences from other CARD member countries and also from Asian countries. The first strategy was approved by the government in 2010, entitled “National Rice Research and Development of Ethiopia (2010 – 2019)” (MoARD, 2010). Facilitation of the drafting of a strategy specific to the rice seed system was made, and the government approved it in 2017 (MoANR, 2017). This was followed by the support to revise, and the revised strategy entitled National Rice Development Strategy-II (2020 – 2030) was approved in 2020 (MoA, 2020). In line with the development of these strategies, the development cooperation also supported running a national rice secretariat within the MoA that facilitates the functioning of the National Rice Technical Committee (D. Alemu, personal communication, March 10, 2025).

### **Construction of a national rice research and training centre**

Linked with the first National Rice Research and Development strategy, one of the priority needs and investment areas identified was capacitating the country with rice research, and also the development of human capacity through training. The Japanese government, through JICA, invested in the construction of a full-fledged research and training centre dedicated to rice in the Fogera plain, the initial rice production and processing areas near Woreta town. The centre was officially inaugurated in 2018, even though the research and training activities partially started in 2013 when the government approved the centre as one of the federal research centres under the Ethiopian Institute of Agricultural Research (EIAR). The centre, officially called National Rice Research and Training Centre (NRRTC), serves as a

national centre of excellence for rice, and it closely works with AfricaRice and International Rice Research Institute, especially to ensure the generation and release of rice varieties and associated technologies (Shiratori et al., 2019, D. Alemu, personal communication, 2025)

### **Capacity building**

The implementation of rice projects considers building capacity both in terms of human resources and also investing in the required facilities needed to undertake research and training. The human capacity development covers (i) formal long-term training for researchers, (ii) short-term training for researchers, extensionists and beneficiary rice farmers and rice value chain actors, and (iii) exposure visits to major rice-producing countries for policy makers, including to Japan, other Asian countries and Africa (Tanzania and Uganda) (Shiratori K., 2025).

### **Implications for development partners**

The approaches in the design and implementation modalities of projects through the Japanese development cooperation in Ethiopia clearly indicate key lessons and experiences in contributing to the national development in a sustainable manner. The key lessons are related to the need for (i) proper identification of target areas for development collaboration. This is manifested in the considered three cases, where JICA had identified key development needs where the country demands support in terms of the lack of skilled manpower for operation and maintenance of heavy duty construction machines, for groundwater development, and for research for development of rice sector; (ii) assistance and guidance for design and development of long-term strategy in the target areas of development cooperation; (iii) targeting long-term objective(s) for each of the development collaboration areas. In all three cases, there were long-term interventions until the country developed internal capacity in terms of required infrastructure, institutional setup, and human capacity (iv) engagement of relevant actors, both public and private, and (v) comprehensive coverage (human capacity, infrastructure and institutional development), as it has been seen at Alemgena, EWTI and NRRTC at Woreta.

**Identification of target areas for development collaboration**

The identification of areas for development cooperation often considers not only reflected domestic demand from the Ethiopian government but also covers critical assessment and design of a high-level country assistance program, often revised every five years. The target areas of development collaboration are then designed within the framework of the high-level country assistance program, that are often aligned with Ethiopia's multiannual development plans (MoFA 2008, 2002).

**Assistance and guidance for the design and development of a domestic long-term development strategy**

Once the areas for development cooperation are identified, one of the key components of the interventions is assisting the development of a domestic development strategy. For instance, the first intervention for the rice sector development was assisting the development of the National Rice Research and Development Strategy in 2010, which guided the different interventions for the rice sector, including the need for the establishment of the National Rice Research and Training Center within the national agricultural research system. Strategy development often considers: (i) international benchmarking to gain experiences, (ii) thorough assessment of the domestic challenges and opportunities, (iii) technical backstopping for the design process, (iv) international and national validation of the draft strategy and (v) facilitation of regular revision considering emerging trends, often every five years (D. Alemu, Shiratori K., Personal communication, 2025).

**Setting long-term objective(s) for identified areas of the development collaboration**

The uniqueness of the Japanese development cooperation is setting long-term objectives since the start of interventions for the identified area of development assistance. As presented in each of the cases presented above, the projects were implemented in phases (each phase about five years), and the implemented activities in each phase complement each other so that the set long-term objective is achieved, mainly ensuring the development of local capacity in terms of infrastructure, human capacity and institutional setup. The three cases show that the country now has a state-of-the-art training center for heavy-duty machinery operation and maintenance at the Training and Testing Center of ERA. An institute for Water Technology (Ethiopian

Water Technology Institute – EWTI), which started with the establishment of EWTEC as the first training organisation in the fields of groundwater development and water supply in the country, which started covering the first basic training courses covering groundwater investigation, well drilling technology, drilling machinery maintenance, and electrical machinery maintenance and now is engaged in producing the required number of skilled human resources who can deal with groundwater and water supply management for sustainable water supply construction and maintenance in Ethiopia. And the NRRTC, which is serving as a national center of excellence for rice research and development with state-of-the-art research infrastructure, human capacity and institutional setup.

### **Engaging relevant stakeholders**

In general, the different development cooperation projects are often hosted in a relevant public organisation with a formalised relationship that sets a clear expectation from both the project and the hosting public organisation. Depending on the nature of the respective projects, relevant private actors are engaged in different aspects, including capacity building. This aspect often contributes to the sustainability of the project investments.

### **Comprehensive coverage targeting sustainability**

For each of the areas of development cooperation, the coverage of interventions is comprehensive, including (i) skill and knowledge transfer, (ii) local human capacity building, (iii) required infrastructure development, (iv) organisational/institutional development, and (v) facilitation of policy and strategy development. As summarized above, the reviewed cases indicate how the interventions in each of the development cooperations were covered with an end result of an established organizational setup that continues with initiated activities sustainably, as the development cooperation covers development of required infrastructure, human capacity and institutional setup.

### **Conclusions**

Although development cooperation is often debated regarding its effectiveness in promoting economic development, Japanese development cooperation in Ethiopia has made a substantial contribution to sustainable capacity development in priority sectors.

Evidence from the reviewed cases demonstrates tangible and long-term impacts. For instance, the Alemgena Training and Testing Centre (ATTC) of the Ethiopian Roads Authority has developed the capacity to train skilled personnel in heavy-duty machinery operation and maintenance, with notable spillover effects, including the emergence of private training centres across the country. Similarly, the Ethiopian Water Technology Institute has strengthened national capacity in the water sector through education and training, research and technology transfer, provision of specialized laboratory services to maintain quality standards, and support to Technical and Vocational Education and Training (TVET) systems.

In the rice sector, support provided under the Japanese-led Coalition for African Rice Development (CARD) initiative has contributed to the revision of the National Rice Sector Development Strategy, the establishment of essential infrastructure—particularly the National Rice Research and Training Centre at Fogera Plain—and subsequent capacity-building interventions to operationalize the centre. These investments are contributing to Ethiopia’s strategic objective of achieving rice self-sufficiency, which is critical for reducing the substantial foreign exchange burden associated with rice imports, currently exceeding USD 700 million annually.

The effectiveness of Japanese development cooperation can be attributed to several interrelated factors, notably its distinctive approach and implementation modalities. These include the careful identification of priority sectors for collaboration, sustained engagement in the design and development of long-term strategies, clear articulation of long-term objectives, and a comprehensive approach that integrates human capacity development, infrastructure investment, and institutional strengthening. These key interrelated factors related to the approach in development cooperation project design and implementation modalities can serve as key lessons for similar development cooperations in the country.

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*The number of projects includes technical/scientific cooperation projects, grassroots technical cooperation, individual experts, Japan Overseas Cooperation Volunteers, preparatory/planned studies for cooperation, grant aid, and training in Japan. The amount of assistance is the planned amount for projects that had been finalized as of the beginning of FY 2007, and does not include the amounts for individual experts, Japan Overseas Cooperation Volunteers, preparatory/planned studies for cooperation, and training in Japan.*