Republic of Armenia

Ex-Post Evaluation of Japanese ODA Grant Aid Project

"The Project for Improvement of Fire Fighting Equipment in Yerevan City"

External Evaluator: Koichiro Ishimori, Value Frontier Co., Ltd

0. Summary

This project aimed to strengthen firefighting capabilities in the capital, Yerevan City, by deploying firefighting equipment (vehicles and devices) and providing technical guidance for fire rescue detachments in Yerevan City. The project was in line with the development plans and needs of Armenia as well as with Japan's ODA policies, and thus its relevance is high. The implementation of the project has enabled fire rescue detachments to carry out their firefighting activities promptly, and thus its effectiveness is high. It has also contributed to the protection of citizens, entities, and firefighters from fire as well as to international cooperation through its engagement in firefighting activities in Russia. Thus, its impact is high. Since both the project cost and the project period were less than planned, its efficiency is high. There is no problem with the institutional, technical, and financial aspects of the Armenia Rescue Service (ARS), and thus the sustainability of the project's effects is high.

In light of the above, the project is evaluated to be highly satisfactory.

1. Project Description

Project Location

Fire Tank Engines and Ladder Trucks

1.1 Background

Armenia is an inland country that gained independence from the former Soviet Union in 1991. Even after gaining independence, Armenia's economy struggled under harsh conditions and was unable to renovate its deteriorated economic and social infrastructures. Firefighting equipment, which protected the lives and assets of people and society from fire, was used over 20 years after its procurement. Since the automakers of firefighting equipment already stopped producing it, the country was unable to replace spare parts. Consequently, fire tank engines were neither able to respond to fires promptly nor hose the fires appropriately. This

resulted in insufficient firefighting activities. Moreover, ladder trucks were unable to stabilize a ladder, and therefore firefighting activities were very dangerous for both the firefighters and the rescued victims. Under such circumstances, the Government of Armenia made a request that the Government of Japan implement an ODA grant project to deploy new firefighting equipment to fire rescue detachments in Yerevan City, where over 50% of fire cases in Armenia occurred.

1.2 Project Outline

The objective of this project is to strengthen firefighting capabilities in Yerevan City by deploying firefighting equipment (vehicles and devices) and providing technical guidance for thirteen fire rescue detachments.

Grant Limit / Actual Grant Amount	881million yen / 781million yen
Exchange of Notes Date (/Grant Agreement Date)	February 2009 (/February 2009)
Implementing Agency	Armenia Rescue Service (ARS)
Project Completion Date	August 2010
Main Contractor	Toyota Tsusho Corporation
Main Consultant	Fire Equipment and Safety Center of Japan
Basic Design	February 2008 to October 2008
Detailed Design	—
Related Projects	JICA's Group Training (see below for details) 2004: Seminar for Disaster Administrators 2006: Seminar for Disaster Administrators II 2007: Seminar on Disaster Administration in the Central Asia and Caucasus Region 2008: Seminar on Disaster Administration and Fire fighting Techniques in the Central Asia and Caucasus Region 2011: Seminar for Instructors on Improving Fire Administration 2012: Seminar for Instructors on Improving Fire Administration

2. Outline of the Evaluation Study

2.1 External Evaluator

Koichiro Ishimori, Value Frontier Co., Ltd

2.2 Duration of Evaluation Study

The ex-post evaluation study was implemented according the following schedule:

Duration of the Study: August 2013- September 2014

Duration of the Field Study: November 16, 2013～December 1, 2013 and March 15, 2014 ～March 23, 2014

3. Results of the Evaluation (Overall Rating: A[1])

3.1 Relevance (Rating: ③[2])

3.1.1 Relevance to the Development Plan of Armenia

At the time of the ex-ante evaluation study, the law on fire in Armenia, "the Law of the Republic of Armenia on Fire Security (2001)", stipulated that the Emergency Management Administration (EMA), which was renamed the Armenia Rescue Service (ARS) in 2005, should provide reliable fire services. The national development plan, "the Medium-term Public Expenditure Framework 2008-2010", aimed to strengthen functions of ARS in order to protect the public from disasters. In particular, it prioritized provisions of reliable fire services by renovating fire equipment at fire rescue detachments in Yerevan City. Its aim was to strengthen the capabilities to respond to fire.

At the time of the ex-post evaluation study, the Law of the Republic of Armenia on Fire Security (2001) remained unchanged. The Medium-term Public Expenditure Framework 2011-2013 still aimed to strengthen functions of ARS so as to protect the public from disasters. Again, it also prioritized improvement of provisions of reliable fire services.

The project that aimed to strengthen Yerevan City's capabilities to respond to fire by deploying fire equipment (vehicles and devices) and providing technical guidance for fire rescue detachments was in line with the law and the development plan in Armenia – at both the time of the ex-ante and the ex-post evaluation study – and is judged to be relevant.

3.1.2 Relevance to the Development Needs of Armenia

At the time of the ex-ante evaluation study in 2008, there were 1,089 fire cases[3] in Yerevan. However, it was expected that the number of fire cases would further increase due to expansions of town development triggered by population increases. However, fire equipment (vehicles and devices) in Yerevan was over 20 years old and so outdated that they experienced numerous malfunctions. As a result, fire engines could neither leave fire rescue detachments within one minute after receiving an order of dispatch nor sufficiently carry out firefighting activities after arriving at a fire scene. In 2008, fifteen lives were lost and 154 million AMD worth of property was damaged due to the spread of fires. Additionally, four firefighters were injured.

At the time of the ex-post evaluation study in 2013, there were 1,548 fire cases[4] in Yerevan. The number of fire cases increased in conjunction with further town development triggered by population increases. In 2013, two lives were lost and 50 million AMD worth

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1 A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

2 ③: High, ② Fair, ① Low

3 ARS

4 Ibid.

of property was damaged. Additionally, two firefighters were injured. Nevertheless, this is an improvement from the time of the ex-ante evaluation study in 2008.

This project – which aimed to strengthen Yerevan City's capabilities to respond to fire by deploying fire equipment (vehicles and devices) and providing technical guidance for fire rescue detachments - was in line with the development needs of Armenia. Therefore, at both the time of the ex-ante and the ex-post evaluation study, this project is judged to be relevant.

3.1.3 Relevance to Japan's ODA Policy

At the time of the ex-ante evaluation study, the Charter on Official Development Assistance (ODA) (2003) highlighted the importance of "cooperation for improving the quality of life" in order to alleviate poverty in one of its four priorities, poverty alleviation. The Midterm Policy on ODA (2005) highlighted the importance of "protections from sudden threats (including disasters)" through assistance in providing social services in one of its four priorities, poverty alleviations. Besides, the Data Book on Armenia (2008) highlighted the importance of "infrastructure development" in social sectors, including disaster prevention in one of its five priorities, social sectors.

Therefore, the project that aimed to strengthen Yerevan City's capabilities to respond to fire by deploying fire equipment (vehicles and devices) and providing technical guidance for fire rescue detachments was in line with Japan's ODA Policy – at both the time of the ex-ante and the ex-post evaluation study – and is judged to be relevant.

The project played a key role in its aim to deploy fire equipment at fire rescue detachments in Yerevan. This deployment was particularly important in the overall plan to strengthen ARS's capabilities to protect the people from disasters. Further, the project's planned inputs and implementation approaches were considered to be appropriate because the project deployed fire equipment and also provided technical guidance for strengthening Yerevan City's capabilities to respond to fire.

In sum, this project has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Effectiveness[5] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

[5] Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 1： Operation and Effects Indicators

Indicators (Unit)		Figures Before Project	Figures After Project			
		2008	2010 (target)	2011	2012	2013
Percentage of deployed fire tank engines that can leave fire rescue detachments within one minute after receiving an order of dispatch (%)		0	100 (100)	100	100	100
Time required to dispatch fire tank engines after receiving an order of dispatch (min)		2～8	1.5 (1)	1	1	1
Time required to start hosing the fire after arriving at a fire scene (min)	Fire tank engines	7	1 (1)	1	1	1
	Ladder trucks	7	2 (2)	2	2	2
Time required to start hosing the fire after receiving an order of dispatch (min)		19～43	12.5 (10)	12	12	12

Source: ARS

【Percentage of deployed fire tank engines that can leave fire rescue detachments within one minute after receiving an order of dispatch (%)】

New & old fire engines

(Left: new; Right: old)

At the time of the ex-ante evaluation study in 2008, all fire tank engines deployed at fire rescue detachments in Yerevan City were so outdated that they necessitated air supply to an air brake system before their dispatch, which took two to eight minutes. They needed to perform warm-up operations in winter in order to prevent malfunctions, while supplying air to an air brake system, since outside temperature can reach minus 20 Celsius in Yerevan. Consequently, there was no fire tank engine that could leave fire rescue detachments within one minute after receiving an order of dispatch. However, because ARS has since 2010 been properly maintaining new fire tank engines deployed at fire rescue detachments in Yerevan City through the project, the percentage of fire tank engines that can leave fire rescue detachments within one minute after receiving an order of dispatch is 100 percent.

【Time required to dispatch fire tank engines after receiving an order of dispatch (min)】

At the time of the ex-ante evaluation study in 2008, time required to dispatch fire tank engines after receiving an order of dispatch was two to eight minutes, due to the reasons mentioned above. However, as a result of deployment of new fire tank engines through the project in 2010, the issue of supplying air to an air brake system has been resolved, which

resulted in the significant reduction of time required to dispatch fire tank engines after receiving an order of dispatch. In 2010, it took one and a half minutes because they still needed over one minute of warm-up operations in winter in order to prevent their malfunction. After 2011, however, it became possible to dispatch them after receiving an order of dispatch in one minute as planned, because ARS installed heaters at fire rescue detachments to reduce time and introduced warm-up operations on a regular basis.

【Time required to start hosing the fires after arriving at a fire scene (min)】

At the time of the ex-ante evaluation study in 2008, it took fire tank engines seven minutes after arriving at a fire scene to connect and extend hoses and then start hosing the fires. It also took ladder trucks the same seven minutes to extend a ladder and then have firefighters reach the top of a ladder. After 2011, however, time required for fire tank engines to hose the fires after arriving at a fire scene was shortened to one minute as planned, because the project provided such new fire devices as hose couplers, as well as technical guidance that is called soft component activities. Moreover, time required for ladder trucks to hose the fires after arriving at a fire scene was shortened to two minutes as planned, because the project provided ladder trucks that were quickly able to extend a ladder and had a basket at the top of a ladder where firefighters stayed.

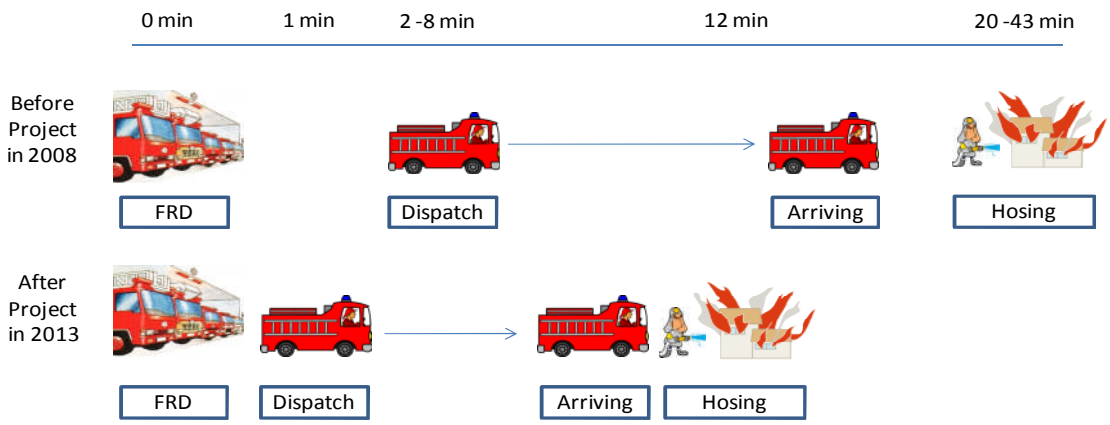
Hose couplers

Basket at the top of ladder

【Time required to start hosing the fires after receiving an order of dispatch (min)】

At the time of the ex-ante evaluation study in 2008, it took two to eight minutes to supply air to an air brake system and perform warm-up operations before dispatch, ten to twenty-eight minutes to arrive at a fire scene because of slow driving due to outdated fire tank engines, and seven minutes to start hosing the fires after arriving at a fire scene. Consequently, time required to start hosing the fires after receiving an order of dispatch was nineteen at the earliest to forty-three minutes at the latest. Since the project provided new fire equipment (vehicles and devices) and technical guidance as its soft component in 2010, it became no longer necessary for fire tank engines to supply air to an air brake system and perform over one minute of warm-up operations. It became also possible for them to drive at higher speeds, and then time required to start hosing the fires after arriving

at a fire scene was shortened. Consequently, time required to start hosing the fires after receiving an order of dispatch was substantially shortened. In 2010, it took fire tank engines twelve minutes and a half to start hosing the fires after receiving an order of dispatch in total, since it took one minute and a half to dispatch fire tank engines after receiving an order of dispatch, another ten minutes[6] to reach a fire scene, and another one minute to start hosing the fires after arriving at a fire scene due to the reasons mentioned above. However, after 2011, it took them twelve minutes in total, because time required to dispatch fire tank engines after receiving an order of dispatch was reduced thirty seconds. Although twelve minutes are two minutes longer than the planned target of ten minutes, it still met the Armenian standard of reaching a fire scene within ten minutes after receiving an order of dispatch. Besides, the planned target of ten minutes was corresponding to the Japanese circumstances where many buildings were made of wood that could rapidly spread the fire and not to the Armenian circumstances where many buildings were made of stones that are strong against the fire. Further, the project contributed to reducing thirty-one minutes in maximum (i.e. forty-three minutes before the project became twelve minutes), which meant that the required time after the project became less than one third of the previous situation before the project and enabled firefighters to carry out firefighting activities at an early stage of the fire that was totally difficult before the project. Therefore, it is judged that the effects are considered to be high.



Source: ARS

FRD: Fire Rescue Detachment

Drawing 1: Time required to start hosing the fires after receiving an order of dispatch before and after the project

[6] It was assumed that it would take one to six minutes to reach a fire scene at the time of the ex-ante evaluation report, but it took ten minutes due to increases of vehicles, i.e. traffic jams in town.

3.2.2 Qualitative Effects

The soft components of the project made manuals on operations and firefighting activities of fire tank engines and ladder trucks, and implemented technical guidance, consisting of lectures and actual practices based on the manuals. The technical guidance continued for 20 days for fire tank engines and 16 days for ladder trucks. Consequently, time required to start hosing the fires after arriving at a fire scene was reduced to one minute for fire tank engines and two minutes for ladder trucks, meeting the target of the project. Therefore, the soft components of the project contributed to improving firefighters' skills on operations and firefighting activities of fire tank engines and ladder trucks.

As illustrated above, the quantitative effects seen in 3.2.1 and the qualitative effects seen in 3.2.2 bring about synergetic effects, and thus it is judged that the degree of achievement of effectiveness is high.

3.3 Impact

3.3.1 Intended Impacts

1) Impacts on citizens and entities in Yerevan that were affected by fires.

The ex-post evaluation study conducted interviews with eight randomly-chosen citizens and six entities in Yerevan that were affected by fires in 2013. The purpose of these interviews was to assess the degree of satisfactions about protections of citizens and entities from fires. The entities were: a nursery, a construction material company, the national natural science academy of botanical garden, an oil retailer, an agricultural trade company, and a candy maker. The results of the interviews received no negative comments about the protections. Many of the respondents commented that if firefighters had not quickly and effectively carried out firefighting activities, they could have lost almost all properties at the fire scenes, though they could protect their lives by themselves by evacuating from the fire scenes." They also expressed their great appreciation for the project; this revealed their strong satisfaction. Especially, the national natural science academy of botanical garden was able to prevent losses of hundreds of kinds of minor species and the oil retailer was able to prevent thousands of tons of oil from catching fire and ultimately exploding. Therefore, the impact is considered to be high.

2) Impacts on firefighters at fire rescue detachments as direct beneficiaries

The ex-post evaluation study conducted interviews with twelve heads of twelve fire rescue detachments[7] and sixty randomly-chosen firefighters (five from each fire rescue

[7] There were thirteen fire rescue detachments in Yerevan at the time of the ex-ante evaluation study. Later that number became twelve in June 2012 due to reasons mentioned in section of 3.5.1 of the institutional aspects of operation and maintenance.

detachment). The interviews served to assess the degree of protection and satisfaction felt by firefighters themselves. Again, the interviews resulted in zero negative comments. Many of the respondents commented that they felt safer than before because they were quickly able to reach a fire scene and carry out firefighting activities at an early stage due to the newly deployed fire engines. They also commented that they were more efficiently and effectively able to carry out firefighting activities than before because the usage of hose couplers was higher and the convenience of changing hosing patterns depending on fire situations was greater. They also felt that they were more safely able to carry out firefighting activities than before because fire suits and respirators were lighter and stronger, and helmets that served to protect eyes and neck from sparks were more practical. These findings imply that firefighters were highly satisfied with the newly deployed fire equipment (vehicles and devices), and this coincides with the fact that the annual number of injured firefighters became fewer than before[8]. Therefore, the impact is considered to be high.

New & old nuzzles
(Above: old; Below: new)

New & old fire suits
(Left: new; Right: old)

3.3.2 Other Impacts

1) Impacts on the Natural Environment None

2) Land Acquisition and Resettlement None

3) Unintended Positive/Negative Impacts

I. Strengthening educational systems on firefighting activities

The Crisis Management Academy (CMA), under the umbrella of ARS, educates and produces candidates of executives. Its rector participated in a JICA's group training for disaster administrators in 2004. Since the creation of the faculty of fire engineering at CMA in 2005, it has been educating and producing twenty to twenty-five candidates of executives specialized in fire per year. Additionally, another seven executives at ARS also participated in JICA's group trainings for disaster prevention administrators and

8 On average, three firefighters per year were injured from 2006 to 2008 before the project, but only two firefighters per year were injured from 2010 to 2013 after the project.

firefighting techniques from 2006 to 2008. One of the seven executives who taught at CMA both learned fire management systems and obtained basic knowledge and skills on the latest fire equipment. He was then able to teach firefighting activities to students at the faculty of fire engineering by using the latest fire equipment. In this way, the JICA's group trainings from 2004 to 2008 contributed to strengthening educational systems on firefighting activities before the project.

Likewise, seven different executives at ARS took part in JICA's group trainings on improving fire administration for instructors from 2011 to 2012, which were after the project completion. One of the seven executives, who was the vice-rector of CMA, is trying to improve training facilities by making plans to construct such facilities as a high tower for training and a dense-smoke, hot-air training room. In this way JICA's group trainings from 2011 to 2012 also contributed to strengthening educational systems on firefighting activities.

II. International Cooperation

During the implementation stage of soft components of the project, a large scale wildfire occurred near Nizhnij Novgorod, the fourth largest city in Russia, which is about 300 km away to East from Moscow. The President of Russia requested firefighting cooperation from the President of Armenia. Based on the request, the President of Armenia organized a firefighting team consisting of the deputy head of the Fire Rescue Department, as the firefighting leader, and his twenty-seven firefighters who were receiving technical guidance by soft components of the project. The firefighters were airlifted to Russia with four fire tank engines that had been procured by the project. The team carried out firefighting activities near Nizhnij Novgorod for 20 days and succeeded in extinguishing the wildfire. The President of Russia awarded Armenia for its services.

As illustrated above, one can observe positive impacts on citizens and entities in Yerevan as well as on firefighters themselves from the section entitled, "3.3.1 Intended Impacts." Positive impacts can also be seen in strengthening the educational systems of firefighting activities and international cooperation at the section entitled, "3) Unintended Positive/Negative Impacts of 3.3.2 Other Impacts."

This project has largely achieved its objectives. Therefore, its effectiveness and impact are high.

3.4 Efficiency (Rating: ③)

3.4.1 Project Outputs

Table 2: Details of Outputs

Planed outputs	Actual outputs
Fire equipment (vehicles)	
Fire tank engines of 3,500 L x 19 (2WD: 13, 4WD: 6)	As Planned
Fire tank engines of 10,000 L x 5	As Planned
Ladder trucks x 2	As Planned
Fire tank engines of 1,000 L x 2	As Planned
Fire equipment (devices)	
Fire outfits (fire suits, helmets, and groves) 108 sets	As Planned
Respirators 78 sets	As Planned
Others, spare parts, etc.	As Planned
Technical guidance on operations and firefighting activities	
Creation of manuals on operations for fire tank engines and ladder trucks	As Planned
Creation of manuals on firefighting activities for fire tank engines and ladder trucks	As Planned
Technical guidance on operations and firefighting activities for fire tank engines, for 50 firefighters	398 firefighters Since the number of fire tank engines was large at 26, Armenia requested that the project train as many firefighters as possible. Consequently, the real figure substantially exceeded the planned one.
Technical guidance on operations and firefighting activities for ladder trucks, for 50 firefighters	37 firefighters The number of ladder trucks was as small as two and the number of trained targets was only 37. Therefore, the figure was slightly smaller than the planned one. However, the guidance was completed with no problem.

Source: ARS

3.4.2 Project Inputs

3.4.2.1 Project Cost

Competitions for procuring fire equipment by contractors were so strong that the actual project cost was 781 million yen. This was 100 million yen less than the planned project cost of 881 million yen for procurement and design of equipment, resulting in about 89% of the planned cost.

The planned Armenian cost for fuel consumed by fire tank engines and ladder trucks during the implementation stage of the soft components of the project and for others was about 5,160,000 AMD, which was about 1.8 million yen. Meanwhile, the ex-post evaluation study was not able to collect data on the actual cost, because ARS had

regularly procured fuel for all its operations and it was difficult to examine the actual volume of fuel consumed only for the implementation of the soft complements of the project. According to ARS, however, the actual Armenian cost was almost as planned.

3.4.2.2 Project Period

The planned project period was twenty two months;, consisting of five months for detail design and fifteen months for procurement, and two months for technical guidance, from February 2009 (exchange of notes date) to November 2010 (completion of technical guidance). The actual project period was nineteen months, which was shorter than planned, due to reductions of two months for detail design and one month for procurement, from February 2009 (exchange of notes date) to August 2010 (completion of technical guidance).

In sum, both project cost and project period were within the plan. Therefore, efficiency of the project is high.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

Yerevan Fire Rescue Department had thirteen fire rescue detachments from 2008, at the time of the ex-ante evaluation study, to 2010, at the time of the project's completion. The project deployed fire equipment (vehicles and devices) at the thirteen fire rescue detachments. However, executives of ARS decided to combine the fifth and the eleventh fire rescue detachments that were closely located, since they had experienced efficient management of fire stations in Japan through JICA's group trainings. In June 2012, they re-deployed fire equipment (vehicles and devices) that had been deployed at the eleventh fire rescue detachment at the fifth fire rescue detachment. Consequently, the number of fire rescue detachments under Yerevan Fire Rescue Department became twelve. Currently, 534 firefighters at twelve fire rescue detachments (on average forty-four firefighters at a fire rescue detachment) operate the fire equipment (vehicles and devices). Previously, 616 firefighters at thirteen fire rescue detachments (on average forty-seven firefighters at a fire rescue detachment) were to operate at the time of the ex-ante evaluation study. Now that the firefighters realize the planned effects with the fewer number, one can consider that Yerevan Fire Rescue Department has become more efficient. Therefore, there is no problem with the institutional aspects of operation and maintenance.

3.5.2 Technical Aspects of Operation and Maintenance

Development of manuals and provisions of technical guidance by implementing the soft components of the project have transferred techniques on the operations of fire equipment

(vehicles and devices) and firefighting activities to firefighters at each fire rescue detachment. Evan after the project's completion, every day firefighters assuming actual fire cases practice for four hours, consisting of two hours of classroom learning and two hours of practical training, based on the developed manuals under the direction of the firefighting leader of the fire rescue detachments.

Firefighters at each fire rescue detachment carry out daily inspections of fire tank engines. Mechanics at the repair shop of ARS, that learned inspection techniques from automakers of fire tank engines, carry out periodic inspections twice a year. ARS deploys two mechanical experts, one mechanical engineer, two welding engineers, one lathing engineer, three engine engineers, and two vulcanization engineers, in total eleven mechanics, as planned. In case of a large-scale overhaul, which cannot be handled by mechanics at the repair shop of ARS, ARS will outsource to the vehicle maintenance company based on a maintenance contract. When a fire rescue detachment falls short of fire tank engines during the period of repairs at the repair shop of ARS and the maintenance company, it will borrow fire tank engines from other fire rescue detachments by coordinating with Yerevan Fire Rescue Department in advance. Therefore, there is no problem with the technical aspects of operation and maintenance.

3.5.3 Financial Aspects of Operation and Maintenance

The annual budget of Yerevan Fire Rescue Department has been increasing. Yerevan Fire Rescue Department has had no problem disbursing the maintenance cost for fire equipment (vehicles and devices) procured by the project, approximately 8 million AMD per annum, from the budget for repairs. Therefore, there is no problem with the financial aspects of operation and maintenance.

Table 3: Annual budget of Yerevan Fire Rescue Department

(Unit: million AMD)

Items	Before Project	After Project			
	2008	2010	2011	2012	2013
Human Resource	335	528	545	572	682
Foods	17	17	17	17	20
Facilities	14	0	19	32	20
Utilities	20	22	24	25	24
Fuels	31	36	48	47	56
Repairs	8	14	14	17	14
Others	13	18	14	14	16
Total	**438**	**635**	**681**	**724**	**832**

Source: ARS

3.5.4 Current Status of Operation and Maintenance

ARS operates and maintains the fire equipment (vehicles and devices) procured by the project in an appropriate manner. Therefore, there is no problem with operation and maintenance of the deployed fire equipment.

In sum, no major problems have been observed in the institutional, technical, and financial aspects of the operation and maintenance system. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed to strengthen firefighting capabilities in the capital, Yerevan City, by deploying firefighting equipment (vehicles and devices) and providing technical guidance for fire rescue detachments in Yerevan City. The project was in line with the development plans and needs of Armenia as well as with Japan's ODA policies, and thus its relevance is high. The implementation of the project has enabled fire rescue detachments to carry out their firefighting activities promptly, and thus its effectiveness is high. It has also contributed to the protection of citizens, entities, and firefighters from fire as well as to international cooperation through its engagement in firefighting activities in Russia. Thus, its impact is high. Since both the project cost and the project period were less than planned, its efficiency is high. There is no problem with the institutional, technical, and financial aspects of ARS, and thus the sustainability of the project's effects is high.
In light of the above, the project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendation to the Implementing Agency

Annually, Yerevan has an increased number of vehicles that contribute to its worsening traffic jams. Further traffic jams could potentially delay the arrival of fire tank engines at a fire scene and result in the spread of the fire. Therefore, it is expected that ARS consider establishing a new fire rescue detachment if there is an area where fire tank engines tend to arrive late due to traffic jams.

4.2.2 Recommendation to JICA

It is expected that JICA observe ARS's consideration of establishing a new fire rescue detachment in the future. The Operational Plan from 2013 to 2017 in the current Assistance Policy on Armenia aims to strengthen ARS's capabilities to prevent disasters, in particular measures against earthquakes in which Japan has comparative advantages. Since

large-scale earthquakes[9] often cause multiple simultaneous fires, observation of ARS's consideration of establishing a new fire rescue detachment in the future is important to strengthening ARS's capabilities to respond to earthquakes.

4.3 Lessons Learned

【To make full use of thematic group trainings that are implemented as related projects】

The JICA's group trainings on disaster prevention administration that were implemented before the project contributed to strengthening ARS's educational system on firefighting activities and created a solid foundation for receiving the project. Such trainings, which continued after the completion of the project, have further contributed to strengthening and enhancing the realization of the project's effects and impacts, and its sustainability. There are several reasons why JICA's group trainings have worked in accordance with the project. First, top executives of the implementing agency (counterpart agency) had selected as candidates of executives who were excellent in job performance and highly motivated for improvement. Second, they had requested in advance that the selected candidates should make concrete action plans based on what they learned at the trainings. Third, top executives later allocated a budget to fund their action plans on an as-needed basis. In sum, the successful result is a product of the hard work of the implementing agency (counterpart agency) to learn new knowledge and skills on firefighting activities and improve them under the leadership of top executives. When implementing a JICA's group training together with an ODA grant aid project, it can be possible for JICA to expect synergies by demanding that the implementing agency (counterpart agency) consider following the procedures mentioned above.

[9] In 1988, Armenia had a large-scale earthquake with a magnitude of 7.2, resulting in about 25,000 deaths.