Humankind has been facing various global issues in recent years. Since such issues can appear in various forms and affect a wide range of areas, international collaboration with the participation of diverse stakeholders as well as efforts by each country and a comprehensive approach are required to address them. The 2030 agenda aiming at sustainable development goals (SDGs) was adopted by the general assembly of the United Nations in September 2015 and commenced in January 2016. The series of goals indicated in the 2030 agenda covers the various issues required to secure the sustainability of both the earth and human civilization. Going forward, the agenda will influence mid- and long-term policies and actions for international communities. This paper summarizes the current trends of the global issues and studies practical approaches needed to address them and realize sustainable societies in terms of program management.

Keywords: Sustainable Development Goals, Sustainable Society, Global Issues, Program Management

1. Introduction

Humankind is facing various global issues such as climate change, environmental pollution, waste generation, biodiversity loss, water shortage, food security, depletion of natural resources, limitation of land space, infectious diseases, poverty, widening of disparities, conflicts and terrorism, and so forth. International collaboration with the participation of diverse stakeholders as well as efforts by each country are required to address these issues. Furthermore, the introduction of comprehensive approaches
is essential to resolve each issue and secure the sustainability of both the earth and human civilization.

A report entitled “Our Common Future” by the Brundtland Commission of the United Nations released in 1987 defined the concept of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [3]. Later, the Earth Summit was held in Rio de Janeiro in 1992 at which Agenda 21, which aims to achieve the co-existence of the environment and development, was adopted. Twenty years later, the Rio+20 conference on sustainable development of the United Nations was held in Rio de Janeiro again, at which the concluding document “The Future We Want” was adopted. The document covered a wide range of actions including launching the inter-government negotiation process for SDGs [4]. The SDGs were discussed by an open working group consisting of representatives who were nominated in consideration of regional balance. Various experts from a total of 96 countries engaged in a series of discussions in the open working group. As a result, 17 goals and 169 targets of SDGs were finally agreed as common goals for international communities from 2016 to 2030 by the general assembly of the United Nations in September 2015 [2]. The SDGs cover various issues comprehensively from both a global aspect and a local aspect. Since the groups of issues described in the SDGs are diverse and complicated, a comprehensive and interdisciplinary approach based on collaboration among various experts of different fields is required to address them. Furthermore, to attain the SDGs, it is essential that all human beings on earth participate in efforts to optimize our activities and behaviors.

The world population is expected to exceed 9.6 billion by around 2050, of which at least 70 percent will be concentrated in urban areas, with large numbers of people moving from rural areas into cities in the process. Various activities in urban areas generate great local growth in each region and country as economic engines, however, the activities and behaviors of urban areas can have negative global impacts on the earth in terms of energy and resources consumption, greenhouse gas (GHG) emissions, waste disposal and other environment-influencing activities. Accordingly, we need to consider simultaneously both global sustainability (the continuation of the earth) and local sustainability (prosperity of urban areas) in development and urban management. This basically holds true not only for urban areas but also all local areas on earth in which human beings conduct activities.

Regarding global issues or SDGs, there have been many studies on specific themes and individual issues, and there are also several frameworks for discussing and examining approaches to address them. However, there are few practical studies that can be applied to the design and implementation of projects and programs, or to management for addressing the issues. This paper proposes an image of a sustainable society focusing on urban areas where human beings congregate and are active, and clarifies the requirements and means needed to realize a sustainable society. In addition, it examines the role and methodology of program management for realizing a sustainable society in terms of project & program management (P2M).
2. Trends of Global Issues

The world population has been rapidly increasing since the early 20th century. It exceeded 7 billion in 2011, and is expected to reach about 9.6 billion in 2050 and to exceed 10 billion within the 21st century. The concentration of populations in urban areas stimulates various human activities which lead to economic growth, but also causes diverse problems and issues. Development activities including mass production, mass consumption and mass disposal since the Industrial Revolution started in the UK in the 18th century consume large amounts of energy and natural resources, produce much waste, change landscapes and natural environments by constructing various artificial objects, and cause other impacts. As a result, various phenomena which affect the sustainability of the finite earth such as depletion of natural resources, environmental pollution, and damage to the natural environment and bio-diversity have appeared. What is more, the increase of GHG emissions due to the use of fossil fuels, etc. has caused global warming and resulted in various climate change phenomena. Such phenomena have increased the risk of disasters due to record-breaking heat waves, cold waves, intense rainfall, drought, heavy snowfall, strong gales, tornados, changes of sea water temperature, rising sea levels, melting glaciers and so forth.

The 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) was held from November 30 to December 13, 2015 in Paris, France, where it was agreed to set the long-term global goal of limiting the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels [10]. The Paris Agreement of COP21 is significant in that a common goal and necessary actions to counter climate change were set up and confirmed as the mandate of all 196 countries or regions, unlike the previous framework of the Kyoto Protocol in which the major parties were limited to developed countries. In the field of disaster, the 3rd United Nations World Conference on Disaster Risk Reduction (DRR) was held in March 2015 in Sendai, Japan and the Sendai Declaration and Sendai Framework for DRR were adopted. Japan advocated the concept of “Build Back Better (BBB)” of aiming to realize more resilient societies in the process of recovery and reconstruction from disaster so as not to repeat the same vulnerabilities. Japan also emphasized the importance of pre-investment in various countermeasures for DRR in peacetime to build resilient societies systematically and efficiently so as to minimize damages from disaster to protect people and living areas.

The number of natural disasters such as floods and storms has been on the increase recently, although with some fluctuations. Since the total amount of damages from disasters including earthquakes, epidemics and other types has also increased in recent years, countermeasures to cope with various disasters are urgently needed. Disasters cause direct damages to society and also affect the living environment indirectly through decreases in agricultural production due to abnormal climate, water shortages, negative impacts on health, changes of eco-systems, and the like. Thus, the increase of disasters is closely related to development and activities by human beings. The 5th Report of the Intergovernmental
Panel on Climate Change (IPCC) pointed out that global warming is mostly caused by humans. Increases of population and rapid urbanization have resulted in increasing vulnerability and fragility in the face of disasters because many people have no choice but to live in high-risk areas due to lack of proper urban development and preparation for disaster.

The recent trend of globalization has fueled the international movement of people and things, but as a result, various phenomena in one country or region can have global impacts. Economic recession, infectious diseases, environmental pollution, and crime in local areas can easily cross borders. For example, poverty and disparities in one part of the world can threaten stability and peace throughout the world.

Thus, human beings are confronting various global issues. We cannot resolve those issues without global thoughts and actions. Concrete actions necessary for addressing them are being planned, designed and implemented in projects and programs in each country and region. However, in order to take effective action, we need to share and learn from the experiences and lessons of individual projects and programs among international communities and make a combined effort to settle issues and attain international goals. We must consider a practical framework or approach to encourage such concrete actions through projects and programs.

3. Sustainable Development Goals defined by the International Community

In order to address various global issues, international communities have increasingly discussed and agreed on common goals to resolve them since the late 20th century. International communities have actively organized meetings and conferences to discuss issues in various forms and among various members, on both specific and holistic themes. Among them, the Human Environment Conference held in Stockholm, Sweden in 1972, the Earth Summit in Rio de Janeiro, Brazil in 1992 and the Rio+20 conference in Rio de Janeiro in 2012 organized by the United Nations played important roles in increasing international awareness of co-existence of the environment and development. These major conferences contributed greatly to advancing discussions among international communities for global sustainability and development. The declarations and documents released at each conference have evolved in line with changing international trends, newly identified issues, and more sophisticated academic progress.

One of the most influential documents in the past with respect to global sustainability is a report entitled “Our Common Future” by the Brundtland Commission of the United Nations released in 1987. Since then, the concept of sustainable development which advocates fairness between generations has had a large influence on the policies, plans, researches, activities, discussions, etc. of international communities. Sustainable development is a prerequisite for the continuation of both the earth and human civilization. We need to consider it as an obligation for all human beings.

“The Future We Want”, consisting of 283 paragraphs, was compiled and adopted at the Rio+20
conference as the outcome document. Based on the consensus of the conference, SDGs were discussed by the open working group with participants from a total of 96 countries. As a result of the whole process, 17 goals and 169 targets of SDGs shown in Table 1 were adopted as the 2030 Agenda in the general assembly of the United Nations in September 2015. Based on the SDGs, this Agenda set the common goals from 2016 to 2030 for international communities by the adoption of the United Nations. SDGs are composed of three layers: goals, targets and indicators. This structure is the same as that of MDGs. Of the three layers, goals and targets were finalized in September 2015, but indicators are still being discussed as of December 2015 and will be finalized around March 2016. Although SDGs are global goals, concrete actions to attain goals will be taken by each country and region. In order to address a group of diverse and complicated issues, a highly interdisciplinary approach with organic collaboration among various experts is required. It is also necessary to encourage all human beings to engage in proper activities to attain the goals.

### Table 1  Sustainable Development Goals

<table>
<thead>
<tr>
<th>Goal 1: End poverty in all its forms everywhere</th>
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<tr>
<td>Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</td>
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<tr>
<td>Goal 3: Ensure healthy lives and promote well-being for all at all ages</td>
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<tr>
<td>Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</td>
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<tr>
<td>Goal 5: Achieve gender equality and empower all women and girls</td>
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<tr>
<td>Goal 6: Ensure availability and sustainable management of water and sanitation for all</td>
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<tr>
<td>Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all</td>
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<tr>
<td>Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</td>
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<tr>
<td>Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</td>
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<td>Goal 10: Reduce inequality within and among countries</td>
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<td>Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable</td>
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<td>Goal 12: Ensure sustainable consumption and production patterns</td>
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<td>Goal 13: Take urgent action to combat climate change and its impacts</td>
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<tr>
<td>Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development</td>
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<tr>
<td>Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</td>
</tr>
<tr>
<td>Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</td>
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<tr>
<td>Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development</td>
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</table>

Source:Reference [2]

### 4. Realizing a sustainable Society

50% of the world’s population currently lives in urban areas. As urbanization continues to advance in Asia and Africa, this figure is expected to rise to 60% by 2030 and 70% by 2050. In particular, the urban population in Africa will increase drastically, tripling or more in the next 35 years. The total urban area of the world accounts for about only 2% of the land area, yet 60% to 80% of energy is consumed and about 75% of GHG are emitted in urban areas. Since urban areas where populations concentrate play important roles in various social and economic activities, the approaches to development and the behavior of urban areas can greatly affect the sustainability of the earth and human civilization due
to their negative effects, as pointed out in the 2030 Agenda for Sustainable Development [2].

In the Rio+20 conference in Rio de Janeiro in June 2012, the importance of building sustainable cities was recognized and so it was decided to start an intergovernmental negotiation process for SDGs. In order to follow the discussions on SDGs among international communities and to try to identify a direction and stance for JICA, a group of members including the author who are engaged in urban development projects at JICA started an in-house study in September 2012 on how to realize sustainable cities in developing countries. We have been discussing research themes and analyzing existing papers and literature, seeking the opinions of experts and examining the resources of developing countries. As a result, we compiled a report entitled “A study on how to realize sustainable cities in developing countries”. [8]

Figure 1 shows the concept of the sustainable city we propose in the report. In the figure, the circle in the lower part indicates the earth and the middle part represents a city on the earth with a close relation. The five circles in the upper part indicate the requirements that need to be satisfied in order to realize a sustainable city. The first of the five requirements is “Equity and Fairness” which are needed to achieve a stable and inclusive society. The second is “Safety and Security” which are predicated on maintaining peaceful and secure human lives. The third is “Environmental Friendliness” which is indispensable for the continuation of the earth and maintaining comfortable human spaces. The fourth is “Convenience and Competitiveness” which are needed to maximize the vitality and capability of the city. The fifth is “Creativity” which is needed for forming sustainable urban spaces and vitalizing local activities based on the identity of each locality and its local resources with various innovative ideas and technologies. These five requirements are mutually related and it was concluded that a sustainable society where both global sustainability (the continuation of the earth) and local sustainability (the continuation of cities) can be attained by fully satisfying the five interrelated requirements. The image of a sustainable city shown here can be applied to areas other than cities, and can thus be considered as an image of sustainable society.

The means to satisfy the five requirements are urban infrastructure and urban management shown in the middle part of the figure. Urban infrastructure means urban capital, namely: physical infrastructure for the socio-economic basis of urban areas (hardware); institutional capital such as justice, education, medicine, culture, finance, etc. (software); human-related capital such individual awareness and capability; and social capital which provides relationships among people (humanware). Urban management means the capability to cope with various conditions and environmental changes in order to properly control and maintain the urban system consisting of urban capital. Urban management depends on not only governance by public administration but also behaviors and actions by all members living and working in urban areas including individuals. Whether the five requirements can be satisfied or not depends on the situation of urban capital and management capability. The author pointed out in a previous paper [7] that the status of capital and management capability for society can be considered as
social capacity, which is indispensable to realize a sustainable society. Capacity development is a process of increasing capacity, and efforts to address issues basically concern how to build the capacity needed for coping with issues.

Collaboration among international communities in various forms and frameworks is required to move forward with efforts to address global issues. However, it is important for international communities to respect the ownership of each country in striving to address capacity development because each country must itself have the necessary capacity to resolve its own issues. Nobody can continue to shoulder the capacity of other countries in the long term.

This section has proposed an image of sustainable society. Since each country or region has diverse conditions and environments, the actual goal and process to achieving it are always unique for each society, even if the requirements to be met by the target society are the same. In particular, in the case of developing countries, the start line differs greatly among countries. Most developing countries are suffering various urgent problems such as unmet basic human needs due to lack of development and various vulnerabilities while being exposed to diverse global issues. The priority in those countries is to satisfy basic human needs. The continuation of the earth is an unavoidable mission, and yet the co-existence of both the earth and human civilization is a prerequisite for realizing a sustainable society.

Figure 1  Image of a sustainable society focusing on urban areas

5. Roles of Program Management

As already stated, it is required to improve the total capacity of society through a comprehensive
approach for realizing a sustainable society. To do this, it is essential to consider scenarios and actions at the program level aiming to attain the overall mission with a wide view, rather than at the project level aiming at attaining a specific mission with a limited scope. The means to realize a sustainable society are to strengthen the capacity of society consisting of capital and management capability for society. The capacity is composed of three components: hardware, software and humanware. The capacity needed for providing diverse functions and resolving various issues is built by integrating these three interrelated components. However, original capacities differ by country or region, so it is necessary to implement the process of capacity development to build capital and management capability for society by considering the individual conditions, environment, stage of development and other relevant factors of each country or region. This requires tailoring technologies to suit local conditions, adopting grades and specifications suitable for local conditions and also creating an interface for connecting technologies with local society. Furthermore, the understanding of members of society, encouraging proper behaviors and actions by each member towards attaining the goals for the sustainable society, and the processes involved are necessary to create a well-functioning social system which has social value and in which social issues in society have been resolved. Figure 2 indicates the concept of building the desired social system by integrating the three factors of “technology”, “design” and “process”. The actual program consists of a group of projects that are implemented in the timeframe of scheme model, system model and service model (the author proposed the model shown in Figure 3 in Reference [7]). The key point of Figure 4 is that it is necessary to consider both technical and social aspects; these are technical and social planning in the scheme model, technical and social design in the system model and technical and social operation in the service model. The final goal is first accomplished by securing sound social operation as a social system. I think that building a social system with the desirable capacity of society needed for satisfying the requirements of sustainable society by implementing such program means formulating the capital and management capability for society shown in Figure 1. Means for addressing global issues are also the formulation of capital and management capability for society which are needed for attaining goals. In other words, it means building the capacity of society consisting of hardware, software and humanware. It can also be understood as a matter of program management.
Figure 2  Multiplication of three factors needed to create the social system

Figure 3  Program with a group of projects in line with 3S models

Figure 4  Consideration of technical aspects and social aspects in the process
6. Conclusion

It is crucial to address the SDGs for the survival of the earth and human civilization. However, the SDGs cannot be attained without further technological advancement and innovation. We need to challenge various issues not experienced in the past. Finally, we must realize a sustainable society where the continuation of the earth and human civilization is secured. This requires optimizing the activities and behaviors of all human beings towards attaining the goals, in addition to technological advancement and innovation. This paper pointed out that three factors—technologies, design to apply technologies to target societies, and the implementation process—must be organically combined and optimized to realize a sustainable society in the future.

SDGs are global-scale activities that require the participation of the whole world. However, many developing countries consider that developed countries must bear greater responsibility because most of today’s problems are the result of the past development and activities of developed countries. Therefore, developing countries must be given support to address the SDGs through international cooperation by developed countries and multilateral aid agencies to promote work towards the SDGs.

All human beings must work together to address the SDGs with knowledge accumulated globally while sharing information and learning experiences mutually among international communities. An interdisciplinary approach with collaboration among various academic fields and technologies is needed to solve diverse, complicated issues. Accordingly, it is important to strengthen global networks that go beyond individual projects or programs for sharing experience and knowledge, and also to set up frameworks and platforms for promoting such global networks.

This paper has summarized the current situation and trends of global issues and considered the direction of application for program management to address them. I will continue to study practical methodologies based on concrete examples of projects and programs in the future.

(This paper is the author’s personal view, and is not necessarily the view of JICA.)

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