Role of District-level Organization in Decentralized Arrangement of Irrigation Management: Lessons from Water Users Association of Farmers in Japan and Egypt

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1. Introduction

The significance and advantage of decentralized mechanism and participation of water users or stakeholders in irrigation management has been widely recognized in the last decade all over the world. However, some may suspect efficiency of planning, system design, operation and maintenance work for water use in decentralized system. Not only transfer of authority and responsibility from the government to farmers and from national organization to local organization, such as just establishment of Water Users Association, but also re-organizing the whole framework of irrigation related institutions is required for better irrigation management. The process of decentralizing and the basic concept and requirements for it are to be examined. In this report, in these contexts, the Japanese case is reviewed with supplemental introduction of the Egyptian case, and the lessons from the cases are discussed.

Agricultural production, which is based on crop growth, needs water, and irrigation is a major technology to control water condition of the agricultural fields resulting in much production. Irrigation uses much water, and water management in irrigation is essential to food security and human security as well as environment conservation. The water withdrawals for irrigation in the world are estimated at about 2,000 to 2,555 km³ per year (UN Water, 2003), which is about 70% of the whole global withdrawals. It is projected that the world water use for agriculture will increase by some 14% in the mid-2020s, with annual increase of 0.6 %, which takes place with increase of irrigated area from about 2 million to 2.42 million km^2 (FAO, 2004).

At the very local level, irrigation water is managed basically by farmers, as water users. The other end, or the principal or main structure for water use system is generally managed by state and national government or relevant public bodies. In the intermediate scale, like a branch canal level of the irrigation system, the hydraulic structures are managed by the governmental organization in some cases, or by the association of water users. What is the appropriate organization in the in-between scale? It must vary depending on the natural and socio-economic condition of the region or system as well as history and culture. It is a topic of participation of water users in water management system or participatory irrigation management (PIM), which has to be a core issue for better irrigation management.

Since agricultural water management is crucial to the sustainability of the society over the world, it is included in the United Nations Sustainable Development Goals (UN-SDGs), which are the 2030 Agenda for Sustainable Development as the international goals from 2016 to 2030. This agenda consists of 17 goals and 169 targets to realize a sustainable world and pledges to leave no one behind. The 17 goals include those on poverty, hunger and food, and water, which are the key issues and components of agricultural water management (AWM).

Water in agriculture and rural areas is not only a fundamental element of agricultural production and rural life but also brings about environmental preservation and stabilization of industries and societies of nations and regions through stabilization of food production and the rural society. The goals and targets of the SDGs show that AWM appears in not only the targets of Goal 6 on Water, but also in many targets of Goal 1 on Poverty, Goal 2 on Hunger and Agriculture, Goal 7 on Energy, Goal 9 on Infrastructure Development, Goal 11 on Resilience and Goal 13on Ecosystems. This short review confirms that improvement of water management is crucial in addressing the current global issues and is to be well designed and implemented. In addition, section 6.b of Goal 6 about support to capacity and system development is to be recognized as one of the focal points of this report.

2. Participation of Water Users in the IWRM and ILBM

2.1 Basic structure of IWRM and ILBM

Participation of water users in water resources management or basin management, as the involvement of the stakeholders in water management, is stressed in the general management frameworks like IWRM (Integrated Water Resources Management) and ILBM (Integrated Lake Basin Management). For details of the concepts and their schemes see relevant publications.

IWRM is recognized to generally require three essential backgrounds or measures: 1) Legal framework for authorized background, 2) Governance as consensus building system, and 3) Management tool or method for better control or operation and for preparation of materials for decision making. While IWRM is basically understood as a process that covers a river basin as one target area, its hierarchical structure is also an essential and important aspect. The improvement of “local level” management in the basin, such as each sub-basin and any unit of water use, constitutes the substance of IWRM as its indispensable element.

In order to achieve more efficient and sustainable management at the local level, special attention must be paid to the relationship between the nature and people related to regional water use management, based on the society and culture, including natural conditions and history. One may ask how have people perceived and tampered with nature, anticipated the changes, responded to them, and inherited what they had built? These understandings and awareness are the base for the regional-level water management. There must be "knowledge", which functionalizes individuals and organizations as well as material and means, for better and sustainable water management in the region. These fundamental deliberations and approachs are needed to develop better management organization or institutions.

As another point for better water management, “Three I’s” as its components have to be definite.

Better water management should consist of well-organized or designed “infrastructure”, “institution”, and “interconnectedness”. The “interconnectedness” is of the whole stakeholders as well as relevant organizations, which is deeply involved with creating, sharing, and succeeding “information”. The structure and relation of these “Three I’s” is well designed and its performance

affects the sustainability of the region through management of water as the main resource and environmental element of the region.

ILBM stresses the role and importance of water users for better management. In ILBM, stakeholder participation is well-defined as one of the main measures for achieving sustainable management of lakes and reservoirs. Good lake basin management re-quires: 1) Institutions to manage the lake and its basin for the benefit of all lake basin re-source uses, and 2) Involvement of people central to lake, with other four components including 3) Policies to govern people's use of lake resources and their impacts on lakes, 4)Technological possibilities and limitations that exist in almost all cases, 5) Knowledge both of a traditional and scientific nature, and 6) Sustainable finances to fund all of the above activities.

The role and implication of the participation of water users has been increased, and on the other side the government or public bodies expect the increase of responsibilities of the users to hydraulic structure control and maintenance as well as management practices. The governmental organizations might try to transfer the management to the water users and their organization. In this context, the participation of water users in irrigation management is to be recognized as the "irrigation management transfer" (IMT). Thus, PIM is an issue of IMT.

2.2 Recent Development of Collaboration of Stakeholders for IWRM in Japan (Watanabe, 2019)

In the following section, the PIM in Japan is introduced and reviewed. As the background of the discussion, some related legal frameworks of Japan are introduced here, especially the recently established Water Cycle Basic Law.

In Japan, together with prevention and reduction of flood disasters, systems for stable water supply have been prepared, and various infrastructure development have been implemented. Conservation of basin water environment including water quality and ecosystems has also been tackled. In recent years, based on the development of these improvements and the stabilization of water supply, and according to the economic growth trends and demographic dynamics, the establishment of new systems and mechanisms has been made and actual implementation of relevant projects is in progress. Here, the recent history on management of water cycle and water resources of Japan is summarized.

In Japan, based on the continuous modification of the water cycle and the improvement of various systems in the basins and implementation of relevant actual projects related to the development and management of water resources, the establishment of "sound water cycle" was recognized as a fundamental issue. Based on the discussion of the necessity of formulating the basic law aiming at "sound water cycle", finally the "Basic Act on Water Cycle" was enforced in 2014. The Act stipulates the establishment of concrete "collaboration" by stakeholders. The conservation of the sound water cycle requires not only the basic infrastructures and institutions, but also "cooperation" of the stakeholders. To realize the real "collaboration and cooperation" described in the law, some parts or issues are to be entrusted to the local residents or their related organizations in the management plan in a systematic manner. For this, it is required to develop well the

framework for collaboration and consensus building among stakeholders.

To discuss and design the water management organizations and institutions, it is also required to review the general legal framework of the nation with fundamental concepts and policies as the base of local water management.

3. Land Improvement District in Japan

The Japanese irrigation management organizations have been re-reviewed from the point of view of decentralization or participatory irrigation management, and the autonomous aspect of farmers organization and its effectiveness on water management have been re-evaluated in the world context and movement of participatory irrigation management. One of the unique features of the Japanese system, which the authors can recognize, is that the water users organizations hold a hierarchical structure and organization in each layer cooperates with the corresponding governmental organizations in the same layer, playing a different role.

In this report, at first an outline of Japanese agriculture and irrigation management is provided. Secondly, functions and roles of Land Improvement District as water users organization are reviewed. Finally, the Japanese experiences are reviewed to draw some lessons, which could be introduced into other countries or regions.

3.1 Brief Outline of Irrigation System in Japan

Irrigation in Japan is principally meant for rice fields, which occupy 2.405 million ha corresponding to 54% of the total cultivated land. It has a long history of rice cultivation for more than 2000 years. Other crops known as "non-paddy crops" or "upland crops" are largely dependent on rainfall since Japan is classified climatologically as a humid country but irrigation could be a supplemental source of water where rainfall is insufficient or during dry spells.

Japan has had a problem of overproduction of rice for the last three decades. One of the reasons for the over-production is considerable reduction of rice consumption since the 1960s, due to adopting new nutrition habits. Another reason is the increase of the productivity of paddy fields, with agricultural infrastructure improvement projects, which were widely implemented after the World War II by the government, including farmland consolidation and irrigation and drainage systems improvement with the well-established institutions in the rural society. The excess in rice production could not be exported given the high price of Japanese rice compared to that produced by any other country. Since the early 1970s, the Japanese government has been requesting farmers to convert about 20-25 percent of their paddy areas to another crop or to leave them fallow.

The irrigation systems in Japan have spent a long time in forming their present self. Since 17th-18th century in particular, alluvial areas within the greater river basins have been extensively reclaimed, so much of the present paddy areas in Japan were formed in that period. The framework of the present irrigation system was established accordingly. The rice cultivation area increased to 3.4 million ha around 1960 and self-sufficiency in rice was achieved in 1970 for the

first time in the Japanese history.

In 2018, in Japan, agriculture land comprised 4.44 million ha, about 13% of the total land area. The actual rice cropped area was about 1.55 million ha of the total paddy area about 2.40 million ha, almost all of it being irrigated. Paddy rice production is about 10 million ton, the yield being nearly 5 t/ha without husk.

Paddy rice irrigation in Japan is supplementary, because in the growing season, usually from April to September, there is much rain (about 600-800 mm). However, that is not sufficient for paddy rice cultivation; supplementary irrigation is needed, especially during dry spells in mid-summer. Particularly in periods of higher water demand, as in the transplanting period or mid-summer, irrigation is often required for rice cultivation. Since World War II, to stabilize irrigation and production of rice, many and various irrigation projects have been carried out on a large scale by the government as mentioned above. Consequently, paddy rice irrigation has been modernized rapidly and has become more stable. In addition to these improvements, the trend toward decrease in paddy rice area, which is a result of urbanization or conversion to other crops so as to control the overproduction of rice, has led to a more stable water supply to the remaining paddy fields.

3.2 Land Improvement District (LID): Farmers' water management organization in Japan

3.2.1 Land Improvement District (LID)

The Japanese traditional village, called "*mura*" in Japanese, is the base for the present farmers "association". Farmers within every *mura* organized themselves and cooperated to construct, operate, and maintain irrigation facilities on tertiary level. The irrigation system in Japan consists of small-scale regional systems objectively oriented towards economic rice-production, and managed by a decentralized structure of irrigation organizations, with private ownership and legalized water rights, which sufficiently guarantee individual water use.

In Japan, fundamentally, farmlands are divided into Land Improvement Districts (LIDs), which are non-profit entities legalized in accordance with the Land Improvement Act of 1949. There are two types of LID. The first type is the Land Consolidation LID, which executes within a specified region the necessary tasks for farmland improvements such as standardizing the field plot size and its facilities, and constructing and upgrading infrastructure. The second type is the Water Management LID, which operates and maintains irrigation and drainage facilities above tertiary level to allocate and distributes water among users, and voluntarily preserves the ecology of aquatic systems. The second type is normally a permanent LID, while the first type may be dissolved, or converted to the second type after project completion, or merged into another Land Consolidation LID for more holistic development of the area.

In 2018, the total number of LIDs in Japan was estimated as 4,455 with 3.53 million beneficiary members from an area of 2.51 million ha. The smallest LID command is less than 100 ha and the largest could be as sizeable as about 10,000 ha.

Usually, a general assembly, or board of representatives in case of more than 200 memberships, must be held at least once a year for the LID decision-making through equally voting rights and in a democratized manner. The boards of directors and auditors, who are recruited for a specified period, normally four years, administer the LID. According to the Land Improvement Act, the Ministry of Agriculture, Forestry and Fisheries may request technical and accounting reports from the LIDs, conduct on-site inspections, and compel the staff to carry out the necessary actions for whatever appears in violation.

Operation and maintenance costs as well as staff remuneration and administrative expenses are basically collected from members, generally on acreage basis. The national and prefecture governments subsidize the construction costs according to subsidy-ratios dependent upon the project type and size. For the costs uncovered by official subsidy, the LID can borrow long-term loans with low interest to be redeemed as special fees collected from farmers subsequently. The LID can gain additional income from electricity companies for installing electric posts in farm roads and bridges, and from factories and houses for water disposal into drainage canals.

3.2.1 Operation and maintenance of irrigation facilities by LIDs

Construction or improvement of irrigation facilities, including reservoirs, diversion works, and canals, is carried by the national and local governments, or Land Improvement Districts, depending on the scale of the facility or the beneficiary area. After the construction of the facilities, their operation and maintenance is basically carried out by LID, even in the case where the government constructs the facility. In this case, the LID is usually entrusted with operation and maintenance by the national or local governments, or the ownership of the facility is transferred to the LID. Now in 2019, in Japan, 419 dam reservoirs are mainly for irrigation, of which the national government and prefecture government constructed 137 and 243, respectively. Of these irrigation reservoirs, 146 are operated and managed by major LIDs. LIDs also manage and control more than 5,000 irrigation tanks (ponds), 3,300 diversion works, and 12,200 pump stations. The main facilities such as dams and head works (diversion-weirs) constructed by the national irrigation improvement project include about 1,530 structures and 19,000 km of the irrigation and drainage canals. About two-thirds of these facilities are managed by LIDs.

On the other hand, national or local governments carry out the management of larger facilities, including large reservoirs and diversion works constructed across larger rivers and drainage pumping stations, which benefit extensively non-farmland. In the operation and maintenance of irrigation facilities, the LID responsibility is limited to control structures and canals above tertiary level. Farmers' groups and individuals manage and control all facilities at tertiary and field levels.

3.3 LID in Decentralized Irrigation Management Arrangement

3.3.1 Hierarchical structure of LID and irrigation management institutions

On-farm or tertiary level irrigation facilities in a command area of Land Improvement District are operated and maintained by the community–based farmers associations. Water user farmers are responsible for maintaining and cleaning one or two diversion works subject to their locations, a task which is assigned by the LID on almost voluntary basis or very cheap payment. While the law authorizes the LID, most of the community-based farmers associations are not officially authorized.

However, the allocation of roles on operation and maintenance of irrigation systems is functioning well, and water distribution conflicts in tertiary level are be autonomously settled by the association which manages the systems in that level. Here, the critical point is that the role of tertiary level association is indispensable to operation and maintenance of irrigation facilities, and that it could function even if it is not legally authorized.

In the case of the irrigation system with a large command area, a federation of LID may be organized with some LIDs, with certain conditions. It holds a hierarchical structure consisting of some layers. Large-scale irrigation and drainage facilities, of which operation and maintenance management may affect regional hydrological environment and/or socio-economic activities widely, are officially under the direct control of the national or local government. Some of them are often entrusted to LID for operation and maintenance.

In Japan, there is a prefecture federation of Land Improvement Association in each prefecture consisting of almost all LIDs in that prefecture, and one national federation of Land Improvement Associations. These federations can work on some political and /or strategic problems related to irrigation and drainage.

This hierarchical structure of LIDs is functioning well. Water distribution among farmers in a tertiary level is controlled by the rural community according to their environment and socio-economic situation, and LID tries to realize stable water supply to the community 1evel without any 1ack or excess and equitable allocation of water among tertiary level canals, monitoring and assessing the water demand on-farm level. The activities of LIDs may contribute to efficient water use, appropriate operation and maintenance works, and proper rehabilitation planning.

3.3.2 Liaison of LID with centralized arrangement of governmental organization

Land Improvement District in Japan usually works in close communication with a governmental organization like a regional office of the prefectural government. When LIDs form a federation in a prefecture, it may work in cooperation with the prefecture government itself. Also, the national federation of Land Improvement Associations keeps good relationship with the Ministry of Agriculture, Forestry and Fisheries, which holds the jurisdiction over irrigation and drainage policy and administration.

As mentioned above, operation and maintenance of irrigation and drainage systems is primarily executed by water users organization like LID. Therefore, there is no governmental employee or engineer who does actually daily routine water management practice on-farm level. Through liaison with the governmental organizations of somehow centralized arrangement, LID can obtain useful instruction or information from the government and transfer actual conditions or problems to it. For example, LID can propose an irrigation improvement project and the government can suggest appropriate projects to LID.

4. District-level Water Users Organization in Egypt

Egypt is well-known for its long history of irrigation. Various irrigation improvement projects have been implemented, including re-forming the management institutions. To understand the implication of the recent challenges for re-tailoring the district-level organization, the challenges and experiences in Egypt are introduced, to compare with the Japanese case reviewed in the previous section.

4.1 Irrigation Improvement Projects (IIPs) of Egypt

The available water resources of Egypt are limited, depending mostly on the Nile River. In Egypt, water is used much for irrigation, and water saving in irrigation has been a very crucial issue with increase of water demand for increasing population and food demand. Therefore irrigation improvement has been undertaken continuously through many projects. The participation of water users or farmers is also to be developed.

The principal, main and branch canals in the huge irrigation canal system are public property, while tertiary level canals called "*mesqas*" located on private land are owned and managed by the farmers. They have established historically their autonomous management system, or organization. Irrigation water has been traditionally distributed among branch canals with a rotation system under the control of the government.

The Egyptian national government, Ministry of Water Resources and Irrigation (MWRI), has been implementing many and various types of irrigation improvement projects to save water. One of the typical and large-scale projects for developing the PIM is the Irrigation Improvement Project (IIP) initiated in 1993 with the World Bank, after some preceding research and development projects. The IIP is recognized as one of the symbolic challenges in Egypt for the modernization of irrigation. The IIP designs involving the end water users, or farmers, establishing Water User Associations (WUAs) at the *mesqa* level, and founding the performance of water users for operation and maintenance of the hydraulic structures as well as distribution of water (Havidt, 1995). The performance and WUA is directed and supported by the national irrigation advisory service (IAS), which is a governmental organization.

The main objectives of the IIPs were to: a) increase agricultural production and farmers income by improving the irrigation infrastructure, facilitating a more equitable distribution of water, and improved on-farm water management, b) improve the long-term sustainability, through takeover of responsibility for the operation and maintenance of the tertiary level irrigation system by the farmers and their sharing in the costs for the tertiary level investments, and c) strengthen the institutional planning and implementation capacity of MWRI in the irrigation subsector (World Bank, 1994). The IIP attempted to correct inequitable water distribution and water supply shortage at tertiary-level canals (Abou El Hassan WH et al., 2015).

The main tasks of the WUA after organization including election of their officers include the following:

a) participating actively in planning, designing, implementing and formal approval of improved

mesqa systems;

b) operating, maintaining and managing the *mesqa* and branch canal WUAs;
c) developing and implementing operational plans for irrigation scheduling, purchasing, operating and maintaining WUA pumps and implementing regular *mesqa* maintenance;
d) improving continuous flow water supplies, *mesqa* water delivery and decreasing return flow;
e) improving water use management through improved irrigation scheduling and practices;
f) developing roles and responsibilities of *mesqa* and branch canal WUA council members and rules required;
g) developing and maintaining close coordination and good working relationships with organizations for essential services;
h) developing and maintaining good tight communications with WUA members, participating government organizations and other related organizations;
i) mobilizing and managing finances for pumps, equipment and *mesqa* maintenance;
j) federation of WUAs to the branch canal level and functional linkages with the irrigation departments.

Since 1995, the IIPs had been implemented, and the MWRI reported its progress until the year of 2000, as follows: 1,205 *mesqas* (tertiary canal) turned to farmers are improved, 2,548 WUA's are organized, and 1,243 *mesqas* are under design or construction. The total IIP implemented area about 240,000 feddans (100,800 ha), and the area under planning is about 95,000 feddans (39,300 ha). At that stage, it was projected to expand to about 3.5 million feddans with the IIP and participatory water management by the year of 2017 (Mokhtar et al., 1996). (The information of the actual expansion is not available here).

4.2 Development and Challenges of PIM in Egypt – WUA (Molle et al., 2015)

According to the progress of the IIPs and other similar projects, the participation of the water users, farmers, has been boosted though the WUAs, and water use efficiency has been increased with cooperation of the users using improved irrigation and drainage facilities. On the other side, the management of the upper level system, that is the branch level canal and its relevant hydraulic works, has become a big issue for further development of PIM or IMT. The IIPs are expected to be followed by the upper level management improvement, which must be established based on the well-performing WUAs and must make the WUAs function well. It would be mutual collaborated relation of the WUA and the upper-level organization. The upper-level organization BCWUA (Brach Canal Water Users Association), which is of the branch canal level, or the district level, is almost equivalent level to the LID in Japan.

The district level organization is designed as a kind of federation of the WUAs in the beneficiary area. It was expected that the federation would be established easily with the functioning of possible member WUAs. The actual situation or development was not so easy, since there was less incentive for the water users or farmers, and then WUAs. The water intake to the branch canal and operation of the diversion works for distribution in the command area has been carried out by the local office of the NWRI, which is the national government. The water users have no consciousness that they must have responsibility to that level management. They believe water must come "routinely" or "automatically". In addition, the water users, or farmers, in the

command area have not been acquainted to each other, and it is not easy to willingly establish their autonomous organization. As mentioned previously, water management at this level it is crucial to improve local water management. Therefore, establishing a well-designed and well-functioning organization in this level is a hot topic in irrigation management improvement in Egypt.

Of course, in Egypt, there have been many excellent attempts on this issue, and resulting in specific outcomes, and research and review on the topic is ongoing. One of the challenges is the Water Boards Project (WBP), which was initiated within the Netherlands-Egypt Assistance Cooperation Program. The Project was implemented for eight branch canals, trying to motivate and encourage the participatory approach. It was reported that the project led to productivity increase in crop yield, better land and water environment, and lower cost for operation and maintenance. It was also concluded that the project is to be an approach for the essential means in water management and it is encouraged by the participation willingness of water users or farmers and the share and recovery of the cost.

In Egypt, many programs and projects for better irrigation management are being planned and implemented, with participation of water users, for deep collaboration of all stakeholders in the management. With the experiences and analysis on the progress of PIM, some essential components and requisites for well-functioning and sustainable WUA are suggested as follows (Molle et al., 2015):

a) Continuous orientation and reorientation of high-level officials to achieve continuous policy commitment and support;
b) Positive and timely implementation of WUA and cost recovery legal basis, by-laws and policies visible proven improvements implemented in a timely manner which provides increased water control and net farm income;
c) Ownership of WUAs in planning, designing, operating, maintaining and managing their own mesqa;
d) Clear understanding of roles and responsibilities and their own rules and procedure;
e) A clear understanding of and participation in the cost sharing plan for resource mobilization;
f) Regular process documentation and use of lessons learned from monitoring by WUA leaders and IAS staff;
g) Continuous human resource development and training based on real needs of WUAs and IAS staff; and
h) Strong functional linkages with vital organizations and especially with district engineers of the Irrigation Department and agricultural extension staff.

5. Discussion on the Role of District-level Organization in the Irrigation Management

The case of the district-level Irrigation management organization of Japan, Land Improvement District (LID), could be a good model for decentralization in irrigation management. While Japan is located in a humid region with much rain, its experiences and lessons are to be useful for retailoring of irrigation management organization in the area with different conditions even in arid or semi-arid regions (one example is Mamata, 2009). Major points of the important lessons are

summarized as follows:

a) District level or branch canal level governmental irrigation management organizations like irrigation district (ID) is to be privatized and renovated to non-governmental organization, ex. Irrigation Improvement District (IID), while the governmental organization in upper level, such as Irrigation Directorate in Egypt, should keep its governmental identity.
b) Every WUA in tertiary level is to be represented by its chairperson in a fair voting system based on landholding to elect the president and board of directors of the IID under the supervision of the government in charge of irrigation and drainage.
c) The president and the board of directors of IID are to be responsible for making all decisions regarding water resources management, environmental conservation, infrastructure maintenance and construction.
d) A staff of engineers, technicians, and clerks of IID will be the executive body of the IID. Governmental engineers or employees involved at irrigation district management level could be transferred to the new IID, or dispatched temporarily on contract basis under full authority of the IID' s president and completely remunerated from the IID's budget.
e) An existing local governmental organization, in whose command area there are some LIDs, should keep governmental identity and include integrated staff from all involved affiliations (irrigation, drainage, mechanical, etc.).
f) The existing local governmental organization will regulate water among the IIDs located in its command area, supervise the IIDs performance, hold the right of technical and financial inspections whenever assumed necessary, and possess the power to oblige the mal- performing districts to rectify their performance to meet the set-up objectives.
g) The IID may also submit detailed proposals of large-scale projects to national or local government requesting for governmental finance. The projects can be categorized as large scale-projects according to the benefited area and number of beneficiaries from all sectors. The government will study the feasibility of the projects and decide the appropriate procedures for implementation.
h) Irrigation management organization of every level will form a research program with a chairperson and board of directors to exchange their farming and institutional experience, collect farmers' common requests, and investigate and convey them to the regional federation of water use associations. National federation of water users' associations will be the top assembly of farmers' representatives throughout the whole country.
i) The institution of irrigation management described above is apt to be a closed and self-righteous system. Then, its accountability is to be clear and the system is to be operated fairly.

To utilize the lessens above, there is a need for capacity-building and support services for the water users as well as government officers. Generally, over the world, most WUAs are facing financial problems, charging less from their members, and consequently introducing cost-cutting measures and finally resulting in lack of undertaking necessary maintenance and repair work (Vermillion, 1997). In this report, though the aspect of finance of the organization is not discussed, this is a very important issue is to be addressed. In the case of Japanese, generally water fee from the member farmers is collected almost 100% by LID.

It should be noted that, in addition to the above, it is worth mentioning the issue facing LIDs in recent years. In Japan, the declining population of rural areas and the rapid decline of farmers, the aging of farmers and the decline of successors, as well as increasing non-farm population in rural areas, have become serious problems. On the other hand, the participation of corporate farmers with company organizations farmers and farming by farmers' unions are expanding, and the accumulation of farmland use in rural areas and the change of land owners are also progressing. Along with these, changes have started to appear in the composition and functions of the LID. It is necessary to discuss and respond to the decision-making bodies and procedures in the LID, the transfer of expertise and experiences in irrigation and drainage management. In view of these circumstances, the government is modifying and developing measures to re-tailor the cooperative power in rural areas, which has been fulfilled by rural communities like LID, including a partial revision of the Land Improvement Act. Here, we can see that the structure and relationship of individual farmers and the district-level management organizations is a problem. This can be said to have the same issues as those faced in countries and regions that have the task of forming district-level management organizations.

6. Conclusion and Further Necessary Studies

The district-level irrigation management organization, like the Japanese Land Improvement District, as a non-governmental organization, can replace similar governmental organizations particularly in developing countries. Such institutional restructuring or decentralization can lead to effective irrigation management and appropriate operation of systems, since the users participate in decision-making and act as the managers and operators at tertiary level, and in some cases at upper levels. It also can reduce the government’s involvement technically and financially (Kotb, et al., 2002.) The Japanese LID can be a good model for institutionalizing private water management and irrigation entities.

In the decentralization process, it is very important to evaluate which governmental organization should be privatized or be restructured to non-governmental organization firstly. The well-organized cooperation of non-governmental organization with governmental organization might be appreciated and secure and enhance the performance of the non-governmental organization. Finally, to conclude, it is important to state that collaboration and cooperation of the water users is not only a means for better water use but also for the well-being of the people involved, since it must bring out consciousness of belonging to a society, of mutual trust in the society and of contribution in the society.

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