

## POLICY EVOLUTION OF LAND CONSOLIDATION AND RURAL DEVELOPMENT IN POSTWAR JAPAN

Shizuka Hashimoto, Maiko Nishi

### Summary

This paper examines the postwar evolution of land consolidation policy in Japan in light of change in its agenda, scope, approach, policy tools and contexts with the aim to identify its possibilities and limitations for rural development. With a focus on Land Improvement Act (LIA) and other relevant policy tools and schemes, it analyzes the distinctive traits of policy change for the five sequential periods of the postwar era that reflects on socio-economic and political trends. Highlighting the change from government-led and infrastructure-based approach to community-based and managerial-oriented one to land consolidation as an integrated part of broader agricultural and rural development policy, the study suggests future evolution of land consolidation policy that is likely to involve further diverse interests in sustainable development held by a broad range of stakeholders including rural, urban and international communities.

### Keywords

land consolidation • rural development • history • labor productivity • sustainability • agricultural policy

### 1. Introduction

Land consolidation has served as a strategic means to pursue rural development in many parts of the world. In addition to arranging larger and rational land holdings for economies of scale in agricultural structure, it often strategically combines its process with other goals such as infrastructure improvements and implementation of employment, taxation, housing and environmental policies [Pašakarnis and Maliene 2010]. For instance, having evolved since the end of World War II, modern land consolidation practices in Western Europe had originally focused on agricultural production until the 1970s, but recently become an integrated part of rural development involving sustainable land management and ecosystem conservation [Thomas 1998, 2004]. Taking advantage of its integrative possibilities, land consolidation has come to take a cross-sector approach to attain multiple goals encompassing agricultural, environmental and development ones, not only in Western Europe but also in other regions including Central and Eastern Europe and East Asia [Pašakarnis and Maliene 2010,

Huang et al. 2011, Hualou 2014]. While the country-specific complications and designs are acknowledged, however, numerous land consolidation initiatives failed to achieve desirable results without careful reconciliation of local contexts such as farmers' needs, stakeholders' capabilities, demographic features and institutional flexibility [Niroula and Thapa 2005, Thomas 2006a, b, Dijk 2007].

In Japan modern land consolidation projects emanate from the postwar agrarian reform in 1947, although traditionally originated in Land Consolidation Act (LCA) established in 1899 under the semi-feudal system. Whereas inheriting the small-sized plotting (i.e. 10 ares on average) formed through traditional land consolidation practices that prioritized land productivity with the abundant workforce of tenant farmers [Hirota and Okamoto 1999], modern projects began with the postwar democratization of agrarian communities through which small-scale independent farmers emerged across the country with demolition of the feudalistic landlord system. The modern land consolidation policy stemming from the agrarian reform was institutionalized as Land Improvement Act (LIA) of 1949, which constitutes to date a core legislation to implement land consolidation projects and at the same time secure farmers rights and wellbeing. Nonetheless, LIA has gone through a series of amendments over the last 65 years to accommodate additional goals and changed interests, mirroring the socio-economic and political contexts and technological availability in Japan. Despite rich empirical studies that evaluate specific land consolidation projects, little attention has been given to the historical progress of Japanese land consolidation policy. Given the context-specific designs and complications are integral features of land consolidation, revealing Japanese policy evolution of land consolidation contributes to better understanding of the relationships between contexts and contents of land consolidation in Japan and beyond.

This paper aims to examine the historical pathway of land consolidation policy in the postwar era of Japan, with a focus on changes in agenda and objectives of policy and the contexts of such changes. It examines the LIA as a key legislative tool, but also considers other relevant instruments including other legislations, guidelines, subsidiary projects and planning procedures, given the expanding scope of land consolidation in Japan. To elucidate distinctive traits of policy reflecting the socio-economic trends, this study divides the postwar era into five periods: 1) postwar reconstruction (1945–1959); 2) high economic growth (1960–1969); 3) stabilized growth (1970–1984); 4) global competition (1985–2000); and 5) fiscal retrenchment (2001–present). Drawing on literature, policy documents and statistical data, the paper first discusses the historical framework of the postwar land consolidation policy and then examines the five sequential stages of policy evolution. The final section summarizes the findings and draws implications for possibilities and limitations of land consolidation policy in Japan and beyond.

## 2. Periodical framework of modern land consolidation

Literature on policy development of land consolidation in Japan is scarce, particularly for the past few decades. On one hand, most literature specific to the history of land

consolidation policy in Japan focuses on its development around until the early 1980s, tracing back to its inception in the late 19th century. Imamura [1984] reviews the progress of land consolidation over a century along with the state modernization and postwar development of Japan, but only covers the period until the early postwar era. Also, with the overview of historical traits of the institutions related to land readjustment, Ishida [1986] illustrates the development of land consolidation techniques and policy tools also used for urban and peri-urban areas, but covers the period over a century up till 1980. On the other hand, historical studies of the recent agricultural policies extends its scope to a wider range of policy issues, possibly reflecting the broadened scope of land consolidation policy in Japan. Tanino [1994] delineates the postwar development of national land planning and agricultural community development for half a century until the early 1990s, in view of rural development, environmental concerns and global competitiveness. Likewise, Motosugi [2005] depicts the history of rural development policy wherein land consolidation falls as a part, overviewing the period for more than a century until the 2000s.

Despite limited consistency of time frames and policy foci, these studies offer key thresholds of agricultural and rural development policy change relevant to land consolidation. Although covering only the early stage of the postwar era, Imamura [1984] draws a line between the two periods of the postwar years by the year of the establishment of Agricultural Basic Act (1961) that shifted the policy focus from food production to farmers' income increase in response to the urban-rural income disparities. While lumping together the postwar periods up till the end of the 1960s, Motosugi [2005] divides the postwar years into two periods in accordance with different policy foci, including the former focused on an income increase for farmers (until 1969) and the latter focused on living environments for rural population (after 1970), and then subdivides the latter further into two periods including the one on comprehensive agricultural policy (1970–1984) and the other on agricultural internationalization (1985–the mid-2000s). Noting the socio-economic contexts that triggered the shift in agricultural policy, Tanino [1994] breaks down the postwar years into four periods including those focused on postwar reconstruction (1945–1959), high economic growth (1960–1970), stable economic growth (1970–1980), and post-industrialization (1980–the mid-1990s).

The periodical framework for this study primarily draws on these thresholds of political foci and socio-economic contexts that are interrelated with each other. Yet, given the focus on land consolidation, this study gives particular attention to the shifts in policy approach to land consolidation projects, which are analyzed through change in agenda, objectives, tools and strategies of LIA and other relevant policy instruments. In addition, to trace the change for the postwar years till today, it updates the framework by adding on the recent decade in this century. As shown in Table 1, the study divides the postwar era into the five periods reflecting on different socio-economic trends, which correspond to different approaches to land consolidation: 1) farmer-centered approach, 2) modernization approach, 3) multi-goal approach, 4) internationalization approach, and 5) bottom-up and soft approach.

Table 1. Periodical Framework of Postwar Land Consolidation Policy

Periods	Socio-Economic Contexts	Agenda and Approach	Policy Instruments (LIA and others)
Postwar reconstruction (1945–1959)	<ul style="list-style-type: none"> <li>agrarian reform</li> <li>postwar food shortage</li> </ul>	<b>Farmer-centered approach</b> <ul style="list-style-type: none"> <li>establish farmers' rights and responsibilities</li> <li>boost food production</li> </ul>	<ul style="list-style-type: none"> <li>LIA (1949) – consensus building, cost-sharing (“beneficiary-pay principle”) and participation in facility operation and management</li> <li>Agricultural Land Act (1952) – “farmland should be owned by farmers”</li> <li>Emergency Plan (1945) – both land reclamation and improvement for food production increase</li> <li>New Five-Year Plan (1953–1957) – land improvement for food production increase</li> </ul>
High economic growth (1960–1969)	<ul style="list-style-type: none"> <li>disparity between agriculture and other industries (e.g., manufacturing)</li> <li>income gap between rural and urban populations</li> <li>rural-urban migration</li> <li>Rise of part-time farmers</li> </ul>	<b>Modernization approach</b> <ul style="list-style-type: none"> <li>improve agricultural labor productivity</li> <li>increase farm incomes</li> </ul>	<ul style="list-style-type: none"> <li>LIA amendment (1964) – following Agricultural Basic Act (1961) – “farmland consolidation projects” to enlarge a paddy plot and improve its access to irrigation and drainage canals and farm roads</li> </ul>
Stabilized growth (1970–1984)	<ul style="list-style-type: none"> <li>industrial pollution</li> <li>overproduction of rice under agricultural trade liberalization</li> <li>growing urbanization - farmland conversion and reclamation</li> <li>lagging rural living and rural-urban migration</li> </ul>	<b>Multi-goal approach</b> <ul style="list-style-type: none"> <li>control industrial pollution</li> <li>respond to production adjustment and advance labor productivity</li> <li>coordinate farmland use with urban development and non-agricultural land use</li> <li>develop rural infrastructures and ensure a minimum level of rural living</li> </ul>	<ul style="list-style-type: none"> <li>LIAs enforcement order revision (1972) – control of heavy metal contamination of water and soil from mining drainage - following Agricultural Land Soil Pollution Prevention Act (1970)</li> <li>Act for Improvement of Agricultural Promotion Areas (1969) – overseeing investments in agricultural development through zoning</li> <li>LIA amendment (1972) – coordination of land improvement projects with non-agricultural land use, a series of rural improvement projects involving land improvement</li> </ul>

Periods	Socio-Economic Contexts	Agenda and Approach	Policy Instruments (LIA and others)
<p>Global competition (1985-2000)</p>	<ul style="list-style-type: none"> <li>agricultural trade liberalization (GATT agreement in 1993)</li> <li>public interests in rural environmental services</li> <li>challenges in hilly and mountainous areas</li> <li>global and domestic environmental concerns (OECD ministerial agreement in 1987, Rio Declaration in 1992)</li> </ul>	<p><b>Internationalization approach</b></p> <ul style="list-style-type: none"> <li>advance global competitiveness and mitigate its impact on agriculture</li> <li>facilitate rural development - diversify rural income sources</li> <li>regulate environmental impact of land consolidation and promote sustainable development</li> </ul>	<ul style="list-style-type: none"> <li>varied farmland consolidation projects under the UR countermeasure budget (1995-2001) – better labor efficiency and support for authorized farmers</li> <li>land and rural improvement projects - a focus on rural amenities and tourism, and less favored areas</li> <li>guidelines for the environmentally sensitive implementation of land improvement projects (1991)</li> <li>Food, Agriculture and Rural Areas Basic Act (1999) – land consolidation with environmental consideration</li> </ul>
<p>Fiscal retrenchment (2000-present)</p>	<ul style="list-style-type: none"> <li>significant budget cut - administrative and financial reform of agricultural policy in the late 1990s (population decrease and economic slump), political regime shift in 2009</li> </ul>	<p><b>Bottom-up and soft approach</b></p> <ul style="list-style-type: none"> <li>facilitate local planning and designing of land and rural improvement projects</li> <li>provide financial support for individual farmers and collective management activities for rural development</li> </ul>	<ul style="list-style-type: none"> <li>LIA amendment (2001) – Rural Environmental Improvement Master Plan - environmental impact mitigation of land improvement projects</li> <li>Direct Payment to Farmers in the Hilly and Mountainous Areas (since 2000) – differentiated subsidies for farmers in less favored areas</li> <li>Measure to Conserve and Improve Land, Water and Environment (2007) – subsidies for collective management of agricultural facilities</li> </ul>

Source: authors' study

### 3. Postwar policy evolution of land consolidation

#### 3.1. Farmer-centered approach: postwar reconstruction (1945–1959)

Land consolidation policy for the first fifteen years following the end of World War II is featured with the goals to establish farmers' rights and responsibilities and to increase food production. These two major goals were codified in the Land Improvement Act (LIA) established in 1949. As with the Agricultural Land Act (ALA) of 1952 that stipulated "farmland should be owned by farmers" (Article 1), the LIA was formed as a farmer-centered legislation, pursuing the spirit of the agrarian reform for democratization. While deriving from the previous Land Consolidation Act (LCA) of 1899 that had served to facilitate land improvement projects involving land consolidation and associated infrastructure development, the LIA specified farmers' roles and responsibilities in the projects in terms of consensus building, cost-sharing and participation in operation and management of developed facilities. For instance, the LIA stipulated the need for agreement by more than two thirds of community members (legally referred to as qualified individuals) to initiate a land improvement project, and a certain proportion of cost to be born by beneficiary farmers of a project (called "beneficiary-pay principle"). Moreover, the LIA introduced an organization of farmers, called Land Improvement District (LID), to be responsible for operation and management of irrigation and drainage facilities constructed in small-scale projects, whereas national and prefectural governments are responsible for those of medium to large-scale projects.

The establishment of this LIA also reflected the contexts of the postwar food shortage across the country. The government first took an initiative to pursue both land reclamation (1.7 million ha) and improvement (2.1 million ha) through the emergency plan in 1945 to greatly increase food production in response to a sharp increase in food demand fueled by the returned soldiers. Given the difficulties with land reclamation (e.g., shortage of construction materials, conflicts associated with land acquisition), however, the government shifted its focus exclusively to land improvement, revising the emergency plan and enacting the LIA to vigorously facilitate land improvement projects. In particular, the government launched a new five-year plan from 1953 to 1957 to boost food production through land improvement projects, specifically aiming to increase domestic food production by 2.6 million tons, while reducing food imports by 0.8 million tons. These numerical targets were not exactly met, however, partially due to the financial difficulties at the government, but also because food shortage had been already resolved even earlier without waiting for the target attainment. At any rate, the land improvement projects helped ease domestic food shortage to a large extent.

#### 3.2. Modernization approach: high economic growth (1960–1969)

Evolving from the enactment of Agricultural Basic Act in 1961, land consolidation policy in the 1960s was devoted to improve agricultural labor productivity and thus increase farm incomes. This act primarily aimed to reduce the growing economic disparities between agriculture and other industries that resulted from high economic growth

propelled by Korean War in 1950 and supported by a series of national economic plans since 1956. With annual growth rate of more than 10% between the mid-1950s and the mid-1970s, Japan's economic miracle boosted manufacturing industries and uplifted urban living, but left out agricultural industry and rural livelihoods. This disparity facilitated rapid progress in rural-urban migration, while accelerating a replacement of full-time farmers with part-time ones given the economic disadvantage of agriculture even within rural communities. To remedy the rural-urban imbalance and fill the gap between agriculture and other industries, agricultural policy for this decade focused on agricultural modernization through land consolidation and mechanization to improve labor productivity and then farm incomes.

In this context, the LIA was amended in 1964 to introduce a new type of land improvement projects called "farmland consolidation projects", which was an innovation to improve farm structures and practices for better labor productivity [Arita and Kimura 2003]. Traditionally paddy plots were irregular and small in shape, and had limited access to canals and farm roads. In other words, the classic farming system relied on "plot-to-plot irrigation", which required coordination among farmers to timely irrigate water flowing from upper to lower fields, whereas some farmers had to cross other's plots to arrive at their own plots if not directly connected to farm roads.



Source: Yamagata Prefecture

**Fig. 1.** Change in landscape through a land consolidation project in Mogami town, Yamagata prefecture. This shows how the project transformed irregular and smaller farm plots (left) into larger and regular farm plots (right) with access to farm roads and irrigation and drainage canals

This was not particularly demanding in traditional farming dependent on human and animal power, but became troublesome given the rise of part-time farmers and agricultural mechanization. The new mode of projects was designed to enlarge a paddy plot (with the technical standard of expanding to 30 ares) and improve its access to irrigation and drainage canals and farm roads, by integrating land consolidation with construction of these facilities (Figure 1).

This innovation resulted in drastic betterment of labor productivity, reduction in production cost, and a certain extent of expansion of a plot. In fact, work hours per unit area almost halved for rice production, while production cost per unit area reduced by 35% [MAFF 2008]. Also, the proportion of paddy plots larger than 30 ares gradually increased from less than 5% in 1964 to 60.5% in 2006 [MAFF 2008]. Yet, the standard plot size of 30 ares, which was innovative in the 1960s, is considered to be even smaller in today's context.

### 3.3. Multi-goal approach: stabilized growth (1970–1984)

Land consolidation policy for the period from 1970 to the mid-1980s underwent a drastic expansion of its agenda, embracing not only agricultural production but also environmental conservation, supply-demand equilibrium, land-use and rural development. This agenda shift largely emerged from the legacy of the production-oriented mode in the earlier postwar decades. Specifically, the policy set forth the agenda to address the following issues: 1) industrial pollution, 2) excessive rice production, 3) urbanization, and 4) rural improvement.

#### **Industrial pollution**

Land consolidation policy came to involve environmental control as a part, with the revision of the enforcement order of the LIA in 1972, which introduced specialized industrial pollution control to land improvement projects [Huang et al. 2012]. This expansion of the LIA's scope followed the Agricultural Land Soil Pollution Prevention Act that was enacted in 1970 as one of the first series of antipollution legislations in Japan to protect agriculture against heavy metal contamination of irrigation water and farm soil affected through drainage from mines. In Japan, environmental policy and legislation emerged in the late 1960s in response to nationwide antipollution movements to address serious industrial pollution resultant from rapid economic growth. Although much industrial pollution was observed in urban areas and thus led to numerous urban environmental regulations, the expanded scope of LIA is one of the first few legislative attempts to control rural environments. This environmental control through land consolidation policy preceded soil pollution controls in many other industrialized countries including the US Superfund Program, which were implemented from the late 1980s to the early 2000s. As such LIA's antipollution control is somewhat an innovative piece of legislation in the early 1970s.

#### **Excessive rice production**

Land improvement projects under the LIA also took on the role to address overproduction of rice, in tandem with production adjustment policy for rice introduced in 1970.



The excessive rice production became increasingly problematized in the late 1960s, whereas trade negotiations under the General Agreement on Tariffs and Trade (GATT) scheme gradually removed import restrictions of agricultural products. Under the Agricultural Basic Act that was amended in 1970 to adjust rice production and further labor productivity, reclamation of paddy fields came to be prohibited, while the area of paddy field under production adjustment steadily increased from 541,000 ha in 1971 to about 1 million ha in 2003, accounting for 38% of paddy field nationwide. In particular, land improvement projects supported production adjustment, through improvement of drainage capacity by separating drainage from irrigation so as to render paddies not only for rice production but also other crop production. Further, the projects contributed to advancing labor productivity through expanding paddy plots, improving irrigation facilities for dry-field agricultural production, and constructing farm roads for better capacity to transport goods.

### Urbanization

Land consolidation policy also came to involve land use schemes to rearrange farm plots in accordance with growing urbanization. Following mass rural-urban migration, farmland conversion progressed immensely in the absence of substantial land use control, and intensified from the late 1960s to the 1970s with declining rice prices and production adjustment policy. Since the late 1950s a large extent of farmland had been continuously converted to residential and industrial sites, while an increasing area of farmland had been reclaimed (Figure 2). In response, the Act for Improvement of Agricultural Promotion Areas was enacted in 1969 to oversee investments in agricultural development through the Agricultural Land Zone (ALZ) scheme by which farmland within a ALZ<sup>1</sup> is disallowed to be converted for other land use while being specifically targeted to national subsidies including the subsidy for land improvement projects.

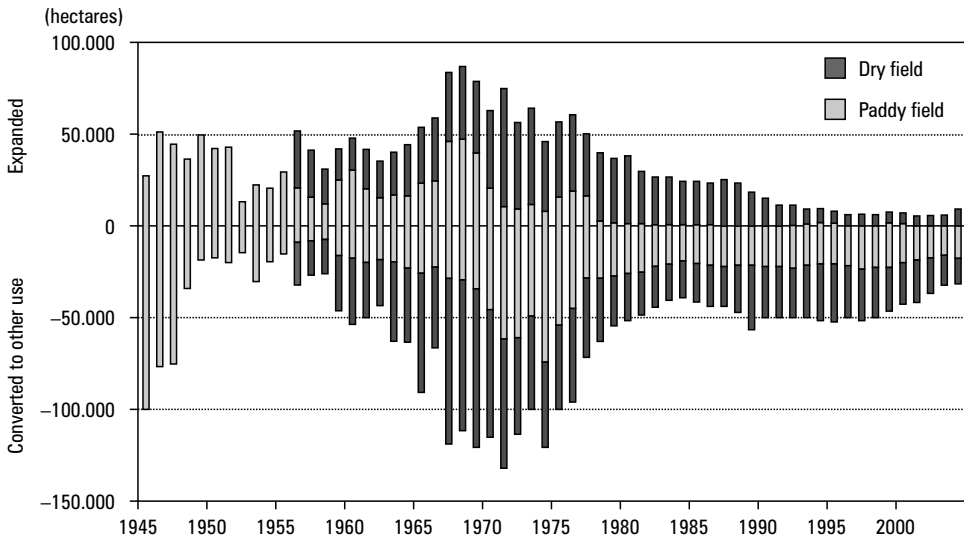
To enhance land use planning, this Act also designates Agricultural Promotion Areas (APAs) embracing ALZs to control farmland use under the jurisdiction of Ministry of Agriculture and Forestry (currently MAFF), whereas the City Planning Act was amended in 1968 to control urban land use with a zoning framework including Urbanization Promotion Areas (UPAs) and Urbanization Control Areas (UCAs) under the jurisdiction of Ministry of Construction. In this demarcation system, conversion of farmland within either UCAs or APAs is substantially controlled [Sorensen 2007], but not in UPAs. Farmland within UPAs is designated for urban development and thus outside the reach of agricultural policy, while being subjected to land use conversion without any official permission. In addition, an extensive area of urban land remained without a demarcation as local governments responsible for implementation of City Planning Act tend to avoid strict land use regulations.

In particular, the LIA was amended in 1972 to coordinate land improvement projects, especially farmland consolidation projects, with non-agricultural land use.

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<sup>1</sup> ALZ includes a block of farmland with more than twenty hectares of total area, an agricultural facility with more than two hectares of beneficiary area, and a site for land improvement projects.

Originally land consolidation practices aimed to re-arrange land property rights among farmland plots so as to consolidate dispersed farmlands, while leaving out the location of non-agricultural land under land improvement projects. Resulting from growing urban development under weak land use control at that time, however, uncoordinated non-agricultural development often impeded smooth implementation of land improvement projects. To ameliorate the situation, the LIA was amended to allow for rearrangement of property rights of non-agricultural land such as residential land adjacent to farmland to pursue farmland improvement while zoning non-agricultural land. This has been widely practiced in farmland consolidation projects to date to meet the needs of residential development.



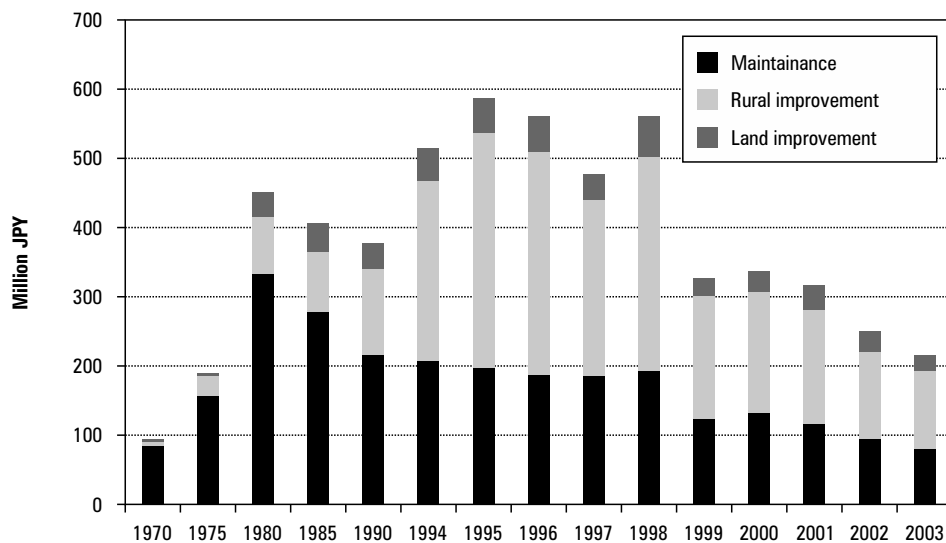
Source: Japanese Statistics Bureau and Statistics Centre

**Fig. 2.** The trend for Japan's farmland expansion and conversion from 1945 to 2004. Farmland expansion is achieved mainly through land reclamation, while conversion results from urbanization and abandonment. This figure is based on statistics of farmland expansion and dilapidation

### Rural improvement

Further, land improvement projects have become integrated in a series of rural improvement projects introduced by Ministry of Agriculture and Forestry since 1972 to remedy rural living environments through construction and improvement of rural infrastructures such as roads, sewage systems and parks along with land improvement projects. With the assumption that improvements in rural living conditions would prevent or at least slow down outmigration of rural population to cities, the projects were intended to expand the infrastructure development projects originally geared to the urbanized or urbanizing areas [Motosugi 2008]. The rural improvement projects

particularly from the 1970s to the 1980s aimed at provision of a minimum level of living conditions (called “national minimum”) through improvement of sanitation and water supply systems. The budget for rural improvement projects increased gradually along with economic growth, accounting for about 65% of the MAFF’s annual budget in 1995 [Motosugi 2008] (also see Figure 3).



Source: Yamagata prefecture 2004

Fig. 3. Budget compositions of land and rural improvement projects in Yamagata prefecture. The share of rural improvement projects in the total land and rural improvement projects’ budget was 6.4% in 1970, and exceeded 50% from 1994

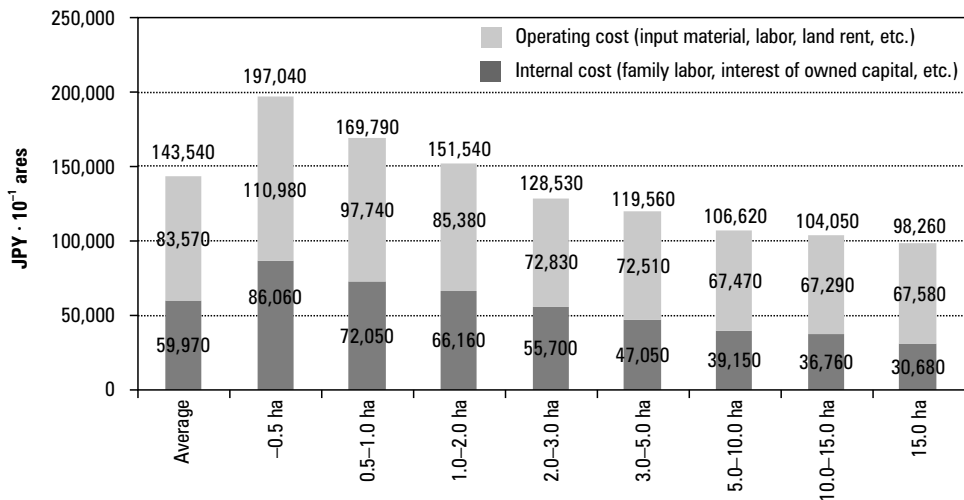
### 3.4. Internationalization approach: global competition (1985–2000)

Land consolidation policy for fifteen years towards the end of the century transformed in an internationally sensitive manner under growing global competition. In particular, it focused on the needs for competitive agricultural sector, rural development and environmental impact mitigation in response to increased trade liberalization and global environmental concern.

#### Trade liberalization

Rural improvement projects integrating land improvement practices came to serve as a critical means to advance agricultural competitiveness against trade liberalization, through transforming agricultural production structures and rural infrastructures. Since the mid-1980s Japan had confronted an increased trade liberalization pressure in the GATT Uruguay Round, and concluded GATT Agreement on Agriculture in 1993 to accept a limited opening of the rice market and remove import restrictions of wheat,

dairy and some other farm products. To mitigate adverse impacts on domestic agricultural production, the government outlined policy framework and program against the GATT Agreement in October 1994, and secured a total budget of about 6 trillion JPY for the next six years from 1995 (called “UR countermeasure budget”). In this regard, MAFF introduced different types of farmland consolidation projects with varied goals and requirements, from which local stakeholders (e.g., local governments and farmers) can choose in accordance with their local situations. Despite the differences, these projects were commonly designed to achieve two objectives: 1) to rearrange paddy plots to construct large-scale plots for better labor efficiency; and 2) to identify and support authorized farmers primarily responsible for agricultural production at a project site, to whom farming rights are leased even while other farms are downsized.

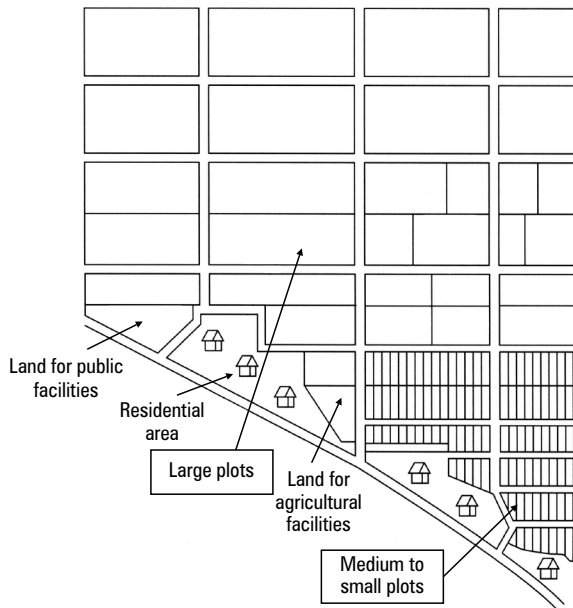


Source: MAFF 2008

Fig. 4. Per-area (10 ares) rice production costs by farm size

These consolidation projects contributed to significant improvement in labor efficiency, but at the same time widened the gap between large-scale and small-scale farmers. The ex-post evaluation of the UR countermeasure budget evidenced that per-acre work hours of authorized farmers reduced by 64% [MAFF 2009]. Also, the area of farmland cultivated by authorized farmers increased from 860 thousand ha in 1995 to 1.3 million ha in 2001, accounting for 17.1% and 27.8% of the national total respectively [MAFF 2014]. In contrast to greater reduction in per-acre production cost for authorized farmers, however, small-scale farmers only marginally improved their production cost. As the per-acre production cost of rice decreases as the farm scale increases (Figure 4), both internal (e.g., family labor and interest on owned capital) and operating (e.g., input materials such as fertilizers and pesticides, and employed labor) costs of rice production are subject to economies of scale. This alludes to a challenge of involv-

ing small farmers in land consolidation projects due to little benefit for them arising from the projects. To address this challenge, a new project design standard has been proposed to allocate small plots in the vicinity of communities for reduced commute time for small farmers to their plots and to place larger plots farther away from the communities where authorized farmers need to commute a longer distance but can still benefit from enlarged and consolidated farmland (Figure 5).



Source: JSIDRE 2001

Fig. 5. Spatial allocation of farm plots proposed in the project design standard for land consolidation projects

### Rural development

Land improvement projects have been combined with rural improvement projects since the 1970s to promote rural development, but changed the focus and direction since the late 1980s. First, the direction shifted from securing a minimum standard of rural living to diversifying income sources of rural residents. Besides improvement in rural living conditions, the goal was expanded in the late 1980s to involve promotion of rural tourism and improvement of rural amenities through construction of rural and water parks and biotopes so as to benefit not only rural residents but others across the country, also with the increased public interest in recreational and educational opportunities in rural areas.

Second, land improvement projects became more focused on hilly and mountainous rural communities (alternatively called less favored areas), which cover 65% of

Table 2. Types of land improvement projects and % of project costs to be paid by governments and farmers

Project name	Target area	Project implementing organization	% of project cost to be paid by			Beneficiary area
			National govt.	Prefectural govt.	Local (municipal govt. and farmers)	
Farmland consolidation project	General	prefectural govt.	50	30	20	20 hectares or more
		municipal govt. or land improvement district	50	15	35	5 hectares or more
Community sewerage improvement project	General	prefectural govt.	0	50	50	less than 20 households
		municipal govt. or land improvement district	50	10	40	20 households or more
Comprehensive development project	General	prefectural govt.	50	25	25	20 hectares or more (farmland)
		municipal govt. or land improvement district	50	20	30	20 hectares or more (farmland)
	prefectural govt.	55	30	15	60 hectares or more	
	municipal govt. or land improvement district	55	20	25	20 hectares or more	

Source: Modified from Ibaraki prefecture 2014

national land and account for roughly 40% of either farmland, farm population or agricultural production in Japan. The areas are featured with a weaker financial base of local governments due to lower tax revenues from a small size of population, and with lower agricultural productivity and limited effect of public investments due to steep geography and often sparse distribution of populations and farmland. Given that lower productivity is unlikely to offer enough payback, the farmers in these areas are often reluctant to join land improvement projects. To address this challenge, a new scheme was introduced to implement land and rural improvement projects specifically in these areas in 1990 with a large amount of national subsidies. As Table 2 shows a typical example of land improvement projects in Ibaraki prefecture, project costs are shared among national, prefectural and municipal governments and farmers all across different types of areas, but with lesser proportion of share for municipal governments and farmers in the case of hilly and mountainous areas.

### **Environmental impact**

Environmental impact of land consolidation projects became first regulated with the guidelines for the environmentally sensitive implementation of land improvement projects issued by MAFF in 1991 [MAFF 1991]. Although negative impact of the projects on local terrestrial and aquatic ecosystems had been known, policy response had to wait for maturation of international policy concerns as well as domestic public interests around the late 1980s. In particular, the OECD ministerial agreement on the agricultural policy reform in 1987 called for “actions to ensure environment protection and sustainable management of natural resources in agriculture” [OECD 1987], while the growing interest in amenities in rural Japan since the 1980s led to the expanded scope of rural improvement projects as mentioned earlier. The 1991 guidelines, which was not legally bound, was limited in terms of its effect, as no detailed technical instructions were provided to make project implementation environmentally sensitive. Yet, the guidelines marked the beginning of policy response to environmental concerns of land and rural improvement projects.

Further, environmental control of land improvement projects came into force more rigorously under the Food, Agriculture and Rural Areas Basic Act (hereafter New Basic Act), which was enacted in 1999 as a revised version of the Agricultural Basic Act of 1961 to respond to new trends such as trade liberalization and increased public interests in food security and other environmental services from rural areas. The New Basic Act emerged in a series of public works legislations amended to incorporate environmental considerations, following the Environmental Basic Law enacted in 1993 as an overarching framework of environmental policy. Departing from conventional antipollution policies, this Law set forth the principle as “ensuring sustainable development with reduced environmental load” to be consistent with the Rio Declaration on Environment and Development adopted in 1992, which marked a historic turning point for environmental policy [MoE 1993]. With the concept of sustainable development, the New Basic Act stipulated land improvement projects to be implemented with environmental consideration (Article 24), while spelling out multifunctionality of agri-

culture, stating that agriculture provides not only food but also multiple environmental services such as water retention and aesthetic landscapes (Article 3).

### 3.5. Bottom-up and soft approach: fiscal retrenchment (2001–present)

Following the New Basic Act, land consolidation policy in this century has come to take bottom-up and soft approach to enhance environmental conservation and rural development under the significant budget cut. The budget for land and rural improvement projects had continuously increased with firstly rapid economic growth (reaching approx. 900 billion JPY in 1979), then growing needs for rural development since the mid-1980s and finally the UR countermeasure budget in 1995, despite the oil shocks in the late 1970s and the economic bubble burst in the early 1990s. After peaking in 1997 with 1.2 trillion JPY, however, the budget began to decrease rapidly from 2002 upon the end of the UR countermeasure budget in 2001, dropping to 577 billion JPY in 2009 (almost 48% of the peak). This trend echoes the administrative and financial reform of overall agricultural policy, which began in the late 1990s to shift its focus from construction and development to maintenance of the existing agricultural and rural infrastructures, being influenced by declining population and prolonged economic slump since the mid-1990s. This budgetary situation worsened with the regime shift from Liberal Democratic Party (LDP) to Japan Democratic Party (JDP) in 2009, after which the budget decreased to 213 billion JPY following one of the JDP's campaign pledges to reduce expenditures for public works. With the LDP's return to power in 2012, however, the budget for land and rural improvement projects has remained more or less the same till today, albeit a slight increase to 459 billion JPY for the fiscal year 2016.

Under the budget retrenchment, the government has promoted bottom-up and soft approach to land and rural improvement projects, instead of top-down infrastructure-based one. The New Basic Act was followed by schemes and measures to mitigate environmental impact and facilitate rural development through self-organized management activities and financial support rather than infrastructural investment. In terms of environmental control, following the New Basic Act, the LIA was amended in 2001 to ensure land improvement projects be implemented in consideration of environmental impact. To effect this, MAFF mandated local governments to develop a "Rural Environmental Improvement Master Plan" in its jurisdiction as an essential requirement for subsidies to implement land and rural improvement projects. The plan imposes preconditions (e.g., information provision on current environmental conditions, and development of environmental conservation measures) to be adopted in the projects. Moreover, MAFF issued a series of guidelines from 2001 to 2004 to better address environmental impacts in planning and designing of land and rural improvement projects.

In terms of rural development, the New Basic Act was followed by payment schemes primarily resting on financial support for farmers to take expected actions, rather than development and implementation of new land and rural improvement projects. For instance, Direct Payment to Farmers in the Hilly and Mountainous Areas was launched



in 2000 to provide subsidies for the farmers who collectively enter an agreement to sustain agricultural production in less favored areas for the next five years. To compensate disadvantageous agricultural production in these areas, this scheme sets out the amount of subsidies in accordance with the area size of farmland to be managed, the steepness of farmland, and the types of crops [Nomura et al. 2013]. In the similar vein, the Measure to Conserve and Improve Land, Water and Environment (MCILWE) was introduced in 2007 to provide subsidies to the community organizations in which farmers and other community members collectively manage farm roads and agricultural canals for the next five years. As management of agricultural facilities has increasingly confronted labor shortage resultant from the aging and decrease of farm population, MCILWE aims to promote collective management of agricultural facilities by involving not only farmers but also other community members.

#### 4. Conclusion

Beginning with the postwar reform for democratization of agrarian society, land consolidation policy in postwar Japan has changed its focus from agricultural production to sustainable rural development, and has become an integrative part of broader agricultural and rural policy. In particular, reflecting on the socio-economic and political trends, the approach to land consolidation projects shifted largely from government-led and infrastructure-based one to bottom-up and soft one, undergoing agricultural modernization and internationalization, and then recent fiscal retrenchment. Despite certain limitations such as competitiveness of small-scale farmers and farmland protection in urban regions, postwar land consolidation policy has contributed to advancing agricultural labor productivity and efficiency in particular for large-scale farmers, ensuring environmental integration of agricultural practices, and promoting collective action for rural community management.

In terms of future evolution, some call for an increased investment in farmland and rural living improvement to meet intensifying global competition and prepare for full market opening of agricultural produce in the near future. Others advocate effective use of tax revenues for emerging issues other than agricultural investments (e.g., future disaster risk management, welfare of children and the elderly, communication infrastructure development), rather than to meet vested interests of lagging rural areas but to tackle the nationwide population trend that has been declining since 2006 and is expected to decrease additionally by 20 million in 2050. Although it is difficult to predict accurately, future evolution of land consolidation policy is likely to be highly subjective to varied interests of a wider range of stakeholders including rural, urban and international communities, given its diversified and expanded agenda.

#### Acknowledgement

This paper was based on the research funded by the JSPS KAKENHI Grant Number 26304034 and 23380138.

## References

- Arita H., Kimura K.** 2003. Land Consolidation of Paddy Field, Nōrintōkeikyōkai.
- Dijk T.V.** 2007. Complications for traditional land consolidation in Central Europe. *Geoforum*, 38, 505–511.
- Hirota J., Okamoto M.** 1999. Significance of Ueno Hidesaburo's "Lecture of Land Consolidation". *J. Agric. Engin. Soc.*, 67, 8, 849–852 (in Japanese).
- Hualou L.** 2014. Land consolidation: An indispensable way of spatial restructuring in rural China. *J. Geogr. Sci.* 2014, 24, 2, 211–225.
- Huang Q., Li M., Chen Z., Li F.** 2011. Land Consolidation: An Approach for Sustainable Development in Rural China. *AMBIO*, 40, 93–95.
- Huang W., Hashimoto S., Hoshino S., Kuki Y.** 2012. Expansion of farmland heavy metal contamination in Taiwan: Identification of societal background of the contamination and limits of existing countermeasures. *J. Agricult. Engin. Soc., Japan* 80, 6, 489–498 (in Japanese).
- Ibaraki prefecture. 2014. Guidebook of land and rural improvement projects.
- Imamura N.** 1984. Development process of land improvement policy. [In:] A. Tamaki, I. Hatate, N. Imamura (eds). *Social Structure of Farm Irrigation*. United Nations University, Tokyo, 89–128. Available at: [http://d-arch.ide.go.jp/je\\_archive/society/book\\_unu\\_jpe4\\_a.html](http://d-arch.ide.go.jp/je_archive/society/book_unu_jpe4_a.html) (in Japanese).
- Ishida Y.** 1986. Historical overview of land readjustment system in Japan (1870–1980). *Compreh. Urban St.*, 28, 45–87. Available at: <http://www.ues.tmu.ac.jp/cus/archives/cn17/pdf/28-04.pdf> (in Japanese).
- JSIDRE (Japan Society for Irrigation, Drainage and Reclamation Engineering). 2001. Project design standard for land improvement project: farmland consolidation (paddy), 2001.
- MAFF 1991. On the environmentally-sensitive implementation of land improvement projects.
- MAFF 2009. Ex-post examination of UR countermeasures budget.
- MAFF 2014. Policies for the sustainable development of agriculture.
- MoE (Ministry of the Environment) 1993. The Basic Environment Law.
- Motosugi A.** 2005. The History and Prospects of Rural Policy in Japan. *J. Rural Plan. Assoc.* 24, 3, 159–168. Available at: [https://www.jstage.jst.go.jp/article/arp/24/3/24\\_3\\_159/\\_pdf](https://www.jstage.jst.go.jp/article/arp/24/3/24_3_159/_pdf) (in Japanese).
- Motosugi A.** 2008. Social Significance of Agricultural Land and Rural Improvement Project. *Tochikairyo Shinbunsha* (in Japanese).
- Niroula G.S., Thapa G.B.** 2005. Impacts and causes of land fragmentation, and lessons learned from land consolidation in South Asia. *Land Use Policy*, 22, 358–372.
- Nomura H., Yabe M., Nishio T., Izumi M., Hirai K., Kurokawa T.** 2013. Framework for improvement of farmland biodiversity in Japan. *J. Environ. Plan. Manag.*, 56, 5, 743–758.
- OECD 1987. OECD Ministerial principles for agricultural policy reform.
- Pašakarnis G., Maliene V.** 2010. Towards sustainable rural development in Central and Eastern Europe: Applying land consolidation. *Land Use Policy* 27, 545–549.
- Sorensen A.** 2007. *The Making of Urban Japan: Cities and Planning from Edo to the Twenty First Century*, Routledge.
- Tanino A.** 1994. *A History of Rural Planning in Japan*. Agriculture and Forestry Statistical Association (in Japanese).
- Thomas J.** 1998. Non-polluting land use and sustainable development in rural regions – support through land consolidation and village renewal. In: *International Federation of Surveyors, FIG Commission 7 – Symposium, Brighton, UK.*

- Thomas J.** 2004. Modern land consolidation – recent trends on land consolidation in Germany. [In:] FIG Commission 7 – Symposium, September, Volvic, France.
- Thomas J.** 2006a. Attempt on systematization of land consolidation approaches in Europe. *Zeits. Geod. Geoinform. Landmanag. (ZfV)*, 131, 156–161.
- Thomas J.** 2006b. Property rights, land fragmentation and the emerging structure of agriculture in Central and Eastern European countries. *Elec. J. Agric. Develop. Econ. Food Agric. Organ.*, 3, 225–275.
- Yamagata Prefecture. Farmland Consolidation. Website: <http://www.pref.yamagata.jp/ou/norinsuisan/140017/publicfolder200712186262495978/H23yamann/H23yamagatannko/H23noti.html>.
- Yamagata prefecture, Agriculture, Forestry and Fisheries of Yamagata. 2004.
- MAFF 2008. Effects of the farmland consolidation project and its farmer's burden. Available at: [http://www.maff.go.jp/j/study/kome\\_sys/11/pdf/data2.pdf](http://www.maff.go.jp/j/study/kome_sys/11/pdf/data2.pdf) (in Japanese).

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Dr. Shizuka Hashimoto  
Graduate School of Agricultural and Life Sciences  
The University of Tokyo  
1-1-1 Yayoi, Bunkyo-Ku, Tokyo, 113-8657, Japan  
e-mail: [ahash@mail.ecc.u-tokyo.ac.jp](mailto:ahash@mail.ecc.u-tokyo.ac.jp)

Maiko Nishi  
Graduate School of Architecture, Planning and Preservation  
Columbia University  
1172 Amsterdam Avenue, New York, NY 10027, USA  
e-mail: [mn2626@columbia.edu](mailto:mn2626@columbia.edu)