Thematic Guidelines on Agricultural and Rural Development

March 2011

Japan International Cooperation Agency (JICA)

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Preface

These *Thematic Guidelines on Agricultural and Rural Development* have been prepared for the purpose of presenting the overall direction and important matters regarding JICA's cooperation projects on agricultural and rural development. They provide a general overview, and outline the associated trends, approaches and methods of assistance. In addition to sharing basic information and knowledge about agricultural and rural development among relevant stakeholders, it is expected that these Thematic Guidelines will also be used as a reference when planning, developing, appraising and implementing programs.

In addition, by making these Thematic Guidelines publicly available, such as via the JICA Knowledge Site, it is hoped that the general public will also become familiar with JICA's basic approaches on agricultural and rural development.

Introduction

Positioning of these Guidelines

JICA prepares thematic guidelines on various development issues as a practical reference for persons involved in JICA's activities to be used when formulating and implementing projects. The guidelines systematically organize the details of each specific issue and the approaches to be adopted. JICA first compiled thematic guidelines for the field of agricultural and rural development in October 2004. Subsequent to this, the world economy experienced a number of changes, including a substantial rise in food prices from 2007 and an associated increase in uncertainty over the supply and demand of food. In addition, there were also other changes in circumstances, such as the launch of the new JICA in 2008 and more recent changes in the trends of cooperation in the field of agricultural and rural development. In view of these circumstances, it was decided to revise the thematic guidelines.

In revising the guidelines, corrections and amendments were made to the following specific items in particular.

Items to be incorporated in the thematic guidelines	Main points	
New measures		
Contribution to food security following the substantial rise in food prices Response to global environmental issues (biomass energy)	 Food security is attained through a combination of domestic production and import. JICA contributes to food security primarily through support for production, based on the policies of the partner country. In the field of biomass energy, consider focusing support on the introduction and construction of systems for the local consumption of local produced energy as seen with biogases, etc. With respect to large-scale initiatives aimed at commercialization and sale, like that seen with bioethanol/biodiesel, consider providing support while also taking account of such factors as competition with food and burden on the environment. 	
Response to global environmental issues (climate change measures)	 Among the various climate change measures, advance cooperation for adaptation strategies, such as for irrigation and drainage in the field of water resources, and for cultivar development and pest control. With respect to mitigation strategies that include CDM, in addition to conducting research studies and verification tests in cooperation with related organizations, incorporate them into specific projects. 	
Response to global environmental issues (agriculture based on the use of local resources, etc.)	• In regions where high-input, high-yield modern agriculture cannot be adopted due to constraints imposed by natural and social conditions, consider the introduction of "agriculture based on the use of local resources" whereby a certain degree of sustainable improvements in productivity are achieved with modest inputs by utilizing the resources found within the region.	

Response to global	• While ascertaining local conditions, consider ways of providing
environmental issues	support which integrate food security and livelihood improvement for
(biodiversity)	farmers with the conservation of biodiversity.
Ways of providing support	• Against a background of advancing internationalization and economic
for market-oriented	growth, there has been increased activity in the commercialization of
agriculture	agricultural products in developing countries too. Provide active
	support for the development of market-oriented agriculture which will
	lead to improved incomes for farmers.
	• Particularly in recent years, many developing countries or emerging
	countries have experienced good economic growth, and in these
	countries, each stage of production, post-harvest processing and
	distribution has been progressively modernized. Rather than uniformly
	applying support for regions which is centered on subsistence
	production, it is important to provide support according to each
	country's stage of development.
Ways of supporting	• In order to address situations in developing countries where
dissemination amid weak	technology dissemination has not advanced because of weak systems
systems in developing	(people, budget, technology), in addition to the existing dissemination
countries	systems, utilize diverse resources that also include agricultural
	cooperatives, farmer-to-farmer dissemination and NGOs.
	• In doing so, first summarize the merits and demerits of the various
	supporters of dissemination, before considering an effective
	combination.
Participatory development	• In order to utilize participatory development as an effective tool and to
in rural development	link it to effective agricultural and rural development that has
	sustainable and ripple effects, rather than as a one-off good practice,
	the policy positioning of "participatory development" and the role of
	public agencies need to be clarified.
Agricultural financing	• Promote agricultural financing with reference to earlier model
	projects.
	• When providing agricultural financing, consider providing support to
	both the organizational and institutional development of lenders as
-	well as the capacity building of borrowers.
Guidelines for sub-sectors	
Livestock farming	• Review past trends in cooperation for livestock farming, and
	reorganize how future cooperation should be provided.
Important matters to keep in	mind when considering the above issues
Effective use of JICA's three	• Agricultural and rural development is an area conducive to
schemes	generating synergistic effects from JICA's three schemes. Present a
	schedule of project development options, showing multiple patterns
	of use.
	• Analyze and organize each scheme, including the characteristics,

	timing of inputs, the limits and potential of synergistic effects, and operational and management points for concern.
Promotion of programs	 Development issues in the field of agricultural and rural development are wide ranging. Therefore, organize and form programs after first promoting appropriate "selection and concentration" in view of the policies of the recipient country and of JICA. In agricultural and rural development, since farmers are the ultimate beneficiaries and growing crops takes time, set program goals and formulate development scenarios from a medium- and long-term perspective.
Cooperation with the private sector	 Provide support in such areas as infrastructure development and technical support, linked to trends in Japan's promotion of overseas agricultural investment for food security. From the perspective of agricultural and rural development in developing countries, aim to build win-win relationships in cooperation with the agricultural activities of private enterprises.

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List of Abbreviations

Abbreviation	Official name	Japanese
ADB	Asian Development Bank	アジア開発銀行
AEZ	Agricultural Ecological Zones	農業生態系
BDF	Bio Diesel Fuel	バイオディーゼル燃料
CARD	Coalition for African Rice Development	アフリカ稲作振興のための共同体
CDM	Clean Development Mechanism	クリーン開発メカニズム
CGIAR	Consultative Group on International Agricultural Research	国際農業研究協議グループ
DAC	Development Assistance Committee	開発援助委員会
FTF	Farmer to Farmer Extension	農家間普及
GATT	General Agreement on Tariffs and Trade	関税及び貿易に関する一般協定
ICARDA	International Center for Agricultural Research in the Dry Areas	国際乾燥地農業研究センター
ICT	Information and Communication Technology	情報通信技術
IPCC	Intergovernmental Panel on Climate Change	気候変動に関する政府間パネル
JARCOM	JICA-ASEAN Regional Cooperation Meeting	JICA-ASEAN地域協力会議
JST	Japan Science and Technology Agency	科学技術振興機構
KR	Kennedy Round	ケネディー・ラウンド
L/A	Loan Agreement	借款契約
M/P	Master Plan	マスタープラン
MDGS	Millennium Development Goals	ミレニアム開発目標
MTEF	Medium Term Expenditure Framework	中長期支出枠組み
OECD	Organization for Economic Cooperation and Development	経済協力開発機構
РНС	Primary Health Care	プライマリー・ヘルス・ケア
PLA	Participatory Learning and Action	主体的参加による学習と行動
PRA	Participatory Rural Appraisal	主体的参加型農村調査法
RRA	Participatory Rapid Appraisal	簡易社会調査・迅速農村調査
SATREPS	Science and Technology Research Partnership for Sustainable Development	地球規模課題対応国際科学技術協 力
TA	Technical Assistance	テクニカルアシスタンス
TICAD	Tokyo International Conference on African Development	アフリカ開発会議

WFP	World Food Programme	国連世界食糧計画
WTO/FTA	World Trade Organization/Free Trade Agreement	世界貿易機関/自由貿易協定

Chapter 1 An Overview of Agricultural and Rural Development

1-1 Significance of agricultural and rural development, and conditions in recent years

An assessment of the circumstances surrounding agricultural and rural development since 2004 from a perspective of supporting developing countries shows three broad trends.

(1) Re-emphasis on agricultural support following substantial rise in food prices

The poor harvests of 2006-2007 and the increased investment in energy crops (soybeans, corn) following the substantial rise in crude oil prices brought about: 1) a rapid rise in grain prices in 2007-2008; 2) restrictions on the export of certain grains in countries such as India and Vietnam; and 3) an increase in the purchase and lease of agricultural land in developing countries by countries such as China and the Gulf states. This in turn led to increased uncertainty over the supply and demand of food in the medium and long term.

Food prices subsequently exhibited some stability, but they failed to return to their previous levels. At the start of 2011, buoyed by bad weather and an increase in demand in emerging countries, grain prices once again climbed to their highest ever levels. Under such circumstances, the impact on the poor in developing countries is particularly significant. According to the Food and Agriculture Organization of the United Nations (FAO), the number of people suffering from hunger in the world would reach 1.02 billion during 2009, and although this number would drop below one billion in 2010, it is extremely unlikely that the Millennium Development Goals (MDGs) of reducing by half the proportion of people who suffer from hunger will be able to be attained.

At the same time, developed countries have expanded their investment for biofuels and food production in developing countries. Previously, inadequate investment had kept agricultural development in developing countries from reaching its potential, and so while this move by developed countries has been evaluated as a good opportunity to boost this agricultural development, at the same time, concerns have also been expressed that it could infringe upon the developing countries' own food security and upon the rights for land ownership and development in rural areas.

Against this backdrop, the World Summit on Food Security was held in November 2009. A joint declaration was adopted that global agricultural output would need to be increased by 70 percent by 2050, and to this end, public and private investment in agriculture would need to be expanded. Thus, amid emphasis being placed on aid and investment in agriculture, the way JICA provides cooperation in the field of agricultural and rural development needs to be revised to a certain degree.

(2) Shift in emphasis from "improvements in productivity and self-sufficiency ratio" to "promotion of commercialization and improvement in profitability"

As a consequence of advancing internationalization and the economic growth of developing countries, agriculture has been positioned as a priority sector for economic development, and there are moves to emphasize the "promotion of agriculture as an industry" which is mindful of commercialization. In the past, agriculture was only ever given a low priority as an industry with poor investment efficiency, but now it is being reconsidered, both in terms of its investment efficiency as a commercial undertaking

and as a driving force for growth of the national economy. In view of these shifts, a form of cooperation is required which ensures both high profitability and certain benefits for farmers.

(3) Reponses to global environmental issues

Agriculture is closely connected to the natural resources of each country or region. Moreover it is characterized by these resources being used to reap a harvest. Therefore, global environmental issues such as climate change and decreasing biodiversity, which have been steadily expanding in recent years, significantly affect the state of agriculture in each country. Amid global warming being regarded as certain, there is an urgent need to strengthen the agricultural production systems of highly vulnerable developing countries. Moreover, discussion on post-Kyoto mechanisms has focused on efforts aimed at reducing greenhouse gases in developing countries, and so responses to global environmental issues will also be important in future agricultural support.

Furthermore, agriculture is rooted in the natural conditions of each region. Consequently, it needs to be practiced while conserving and utilizing those conditions well. At the same time though, any inappropriate farming methods or over reliance on a single variety will cause a reduction in the biodiversity of that region. Therefore, consideration needs to be given to the question of how to strike an effective balance between securing food and the conservation and utilization of biodiversity.

1-1-1 Contribution to food security following the substantial rise in food prices

World grain prices began showing signs of rising in about 2006 and peaked in 2008. This had a considerable impact on countries all over the world, but the impact on developing countries was particularly serious. In some developing countries, the poor in particular were unable to obtain enough food, and in others, there were inevitable changes in government because of growing criticism of the ruling administration. While poor harvests in certain grain-producing countries and the steep rise in crude oil prices are regarded as having triggered the surge in grain prices, other short-term factors have also been suggested, including: (1) increased demand for food in BRICs (Brazil, Russia, India and China) and other emerging countries, and a qualitative change in that demand; (2) growing demand for grain because of biofuels: (3) medium- and long-term structural factors such as the effects of climate change on a global scale; (4) an influx of speculative funds; and (5) export restrictions by grain-exporting countries.

Grain prices subsequently stabilized, but they failed to return to their previous levels, and at the start of 2011, influenced by bad weather and other factors, prices once again climbed to their highest ever levels. Even supposing that bad weather and other short-term factors leading to price surges could be avoided, in the long term, the actual demand for grain is expected to increase from its current about 2.3 billion tons to about 2.8 billion tons in 2030, and so unless production can also be increased accordingly, there is a real chance that the supply-demand balance will tighten once again. Against this background, the strong desire for food security has rapidly intensified in both developed and developing countries, and so the way in which JICA contributes is being questioned.

As also indicated in these Thematic Guidelines, JICA has established Development Objective 1 "sustainable agricultural production" and Development Objective 2 "stable food supply," and has been

working for increased and more stable food production and for efficient distribution and supply. However, even though such efforts for producing and securing food relate so closely to quantity, JICA does not currently indicate how much it has contributed (or how much it is attempting to contribute) in numerical terms. Although it is easy to express the outputs from financial aid numerically, the degree of contribution to food security also needs to be expressed numerically for technical cooperation.

1-1-2 Ways of providing support for market-oriented agriculture, support appropriate for the stage of development

Looking at the developmental process of agriculture, many regions will usually transition gradually from subsistence farming to market-oriented farming (except for regions where plantation farming is practiced and countries that have a socialist economic structure). In recent years, factors have emerged which greatly accelerate this trend. Needless to say, one of them is the advance of globalization via the World Trade Organization (WTO) and free trade agreements (FTAs), and another is the expansion of the so-called middle class as a consequence of economic growth in developing countries. Amid difficult circumstances, developing countries have put forward responses to markets appearing at home and abroad, as well as responses to the influx of cheap agricultural products from overseas.

Over the past few years, it has been the substantial rise in food prices since 2007 that has further influenced this trend. Although this was triggered by unseasonable weather internationally and the surge in crude oil prices, what makes this different from before is that, amid growing uncertainty over the international supply and demand of food from a medium- and long-term perspective, agriculture in developing countries is drawing considerable attention as an export market.

In the past, in many countries, agriculture was only ever given a low priority as an industry with poor investment efficiency, but in response to recent circumstances, it is now being reconsidered, both in terms of its investment efficiency as a commercial undertaking and as a driving force for growth of the national economy. In view of this situation, there is an increasing need in agricultural development assistance to consider a form of development that is mindful of markets.

Particularly in recent years, many developing countries or emerging countries have experienced remarkable economic growth, and in these countries, each stage of production, post-harvest processing and distribution has been progressively commercialized and modernized. Rather than uniformly applying the previous method of support for subsistence production areas, support needs to be provided according to each country's stage of development.

1-1-3 Response to global environmental issues

(1) Development of biomass energy

The active use of biomass energy is an important issue, not only in terms of the "efficient use of energy" and its "contribution to solving global environmental issues," but also because of its potential to lead to the assurance of new income sources through agricultural activities.

On the other hand, there are concerns about competition with food and environmental burdens associated with any large-scale commercial use of biomass energy like that seen during the time of surging food prices in 2007. There is also the fact that biomass energy has not necessarily become

established technologically yet, and the risk that, if used commercially, markets could be significantly influenced by the international supply and demand of energy and food or by the energy policy of individual countries. (As it is, in reality, biomass energy has only become commercially profitable with policy support.)

At the same time though, the idea of "local consumption of locally produced energy generated using local unused resources," such as taking methane gas produced from livestock waste and using it in homes, is an initiative worthy of note because of the benefit to small farmers, sustainability and the fact that it would not be easily influenced by international markets and energy policies. Japan's "Biomass Town Concept" is also in this vein.

(2) Global warming countermeasures

The Intergovernmental Panel on Climate Change (IPCC) forecasts that the effects of climate change will lead to increased rainfall in high-latitude areas, and decreased rainfall in subtropical regions. Furthermore, the FAO predicts that the population living in countries and regions experiencing water shortages will reach 1.8 billion by 2025 and that total agricultural production will decrease by 8 percent in Africa and by 5 percent in Asia, and as a result, it forecasts that 70 percent of the population in Africa will be on the verge of a hunger crisis by 2080.

Moreover, areas where agricultural production is particularly affected by climate change are the arid and semi-arid areas such as the Sub-Saharan Africa, the Middle East and North Africa. It is possible that some developed countries will increase production, and so it has been suggested that, as a result, this could lead to a change in the global distribution of food production, and developing countries could end up increasing their reliance on imports from developed countries. In addition to these long-term fluctuations, climate change is said to also cause localized abnormal weather, and it is feared that meteorological changes that significantly impact agricultural production, such as drought,, floods, high temperatures and low temperatures, will occur with more intensity and frequency than ever before.

In terms of the specific effects of global warming on agriculture in developing countries, there are concerns that it will bring about an increase in vulnerability, such as: (1) a decrease in water supply, desiccation of soil, poor growth of crops, and disease and insect damage because of drought and/or high temperatures; (2) erosion of soil, destruction of agricultural infrastructure (production and distribution infrastructure), poor growth of crops, and disease and insect damage because of torrential rains and floods; and (3) a large contraction or expansion of the land suitable for growing crops because of a change in the agricultural ecological environment.

In terms of measures to counter global warming, adaptation strategies and mitigation strategies need to be taken. Current initiatives for each in the field of agricultural and rural development are as follows.

1) Adaptation strategies

(i) Cooperation in the area of irrigation, drainage and water management is positioned among adaptation strategies as a means of improving the vulnerability of agricultural water, and is

actively undertaken as an important cooperation issue. It is an area in which effective cooperation can be implemented by fully utilizing the three schemes of ODA loans, grant aid and technical cooperation projects.

- (ii) The development and breeding of plant varieties adapted to climate change and the control of disease and insect damage are tackled in some projects. On the other hand, there are few initiatives currently in the area of conserving plant genetic resources.
- (iii) Since there are many candidate projects that are generally regarded as falling under the category of adaptation strategies, the relationship between each project and being a climate change measure needs to be further clarified.
- 2) Mitigation strategies
 - (i) Mitigation strategies are tackled in some projects, but almost all of them are implemented without setting numerical targets for the reduction of greenhouse gases. In general, while many possibilities exist for limiting emissions from agriculture or using carbon sinks, there are also many challenges to overcome, as listed below.
 - Difficulty or high cost in measuring the amounts emitted and absorbed
 - Potential for large fluctuations in the amounts emitted and absorbed due to annual weather conditions, etc.
 - Difficulty in setting standards on decrease in emissions or increase in absorption
 - Difficulty in monitoring the farming conditions for farmers, which may vary every year If aid is provided without giving enough consideration to the above issues, a situation could arise where facilities are left which have little effect, or where complex work processes that are not worth their cost have simply been incorporated into the farming process.
 - (ii) On the other hand, it is expected that increases in demand for biomass energy and strengthened efforts for reduced greenhouse gas emissions will continue to lead to an increase in the need for support in this area.
 - (iii) Aid in agriculture will be provided for each of the major activities expected in this area while evaluating the circumstances relevant to the above issues and the likelihood of overcoming them.

3) Agriculture based on the use of local resources

Agriculture based on the use of local resources is different from the approach of agricultural modernization. Agricultural modernization used to be the mainstream of conventional agricultural development, and is based on a combination of infrastructure improvement, superior plant varieties and agricultural materials (chemical fertilizers, agrochemicals). The aim of this newer approach is for low-input sustainable agricultural development by utilizing the various resources and traditional agricultural technologies that originally exist in the local region.

The promotion of organic agriculture was positioned as a matter of policy in Japan with the passing of the Act on Promotion of Organic Agriculture in 2006. Likewise, in the area of support for developing countries, by systematically reviewing past projects in which agriculture based on the use of local resources had been independently undertaken on the shrewd initiative of the people concerned, and by positioning this approach as a method of support, it could be possible to clarify

a way of providing support to regions that were not able to benefit from the conventional approach of modern agriculture because of regional and social constraints.

- (i) In essence, many of the traditional agricultural practices were used to carry out on a sustainable basis by utilizing local resources, but food shortages have become worse as a consequence of increasing population pressure.
- (ii) Global production improved dramatically through agricultural modernization (intensification).
- (iii) At the same time, some regions or groups were not able to enjoy the benefits of modern agriculture (regional disparity), and there were some problems due to the inappropriate introduction of modern agriculture (decrease in sustainability, environmental burden, imbalance between energy revenue and expenditure).
- (iv) Potential for the application of agriculture based on the use of local resources (blend of this approach with agricultural modernization is also possible). Diverse initiatives at the grass-roots level

			Features			Backgr	Background conditions	
		Sustainability	Population - carrying capacity	Profitability	Population pressure	Poverty level		
Extensive	Africa, etc.	Low	Low	Low	High	High	As population increases, pressure on farming increases, and sustainability and productivity decline	
	Europe, etc.	High	Medium	Medium	Low	Low	Extensive management aimed at realizing market adjustment and multifunctionality while conserving farmland resources	
Use of local resources		High	Medium	Medium	Low - High	Applicable even if high	Improve productivity in a sustainable manner by effectively utilizing local resources as much as possible	
Modern (intensive)		Medium	High	High	Low - High	Low - Medium (roughly)	Improves productivity by committing large amounts of capital and labor, but difficult to apply to all areas. In some cases there are also concerns over sustainability and the environment, etc. (Asia, etc.)	

 Table 1-1 Classification of farming patterns and characteristics of each

1-2 Trends in international assistance

The approach to the development of rural areas in developing countries and the concept of development are intimately related to changes in the conditions that surround them. The concept of rural development has undergone many changes in parallel with shifting historical backgrounds and priority issues that attracted attention at different times. Following are major trends in its history.¹

(1) Emphasis on commercialization (1950 to early 1970s)

This approach emphasized commercialization, such as the introduction of cash crops. It was later criticized for helping to widen the disparity between regions where conditions for agricultural production are favorable and those where they are not, and for weakening food production.

(2) Emphasis on social aspects (basic human needs (BHN) approach: late 1960s to 1970s)

This approach is symbolized by the "Nairobi Speech" on the eradication of poverty, which was delivered by World Bank President Robert McNamara in 1973. Its direct objective was the expansion of social services among the rural poor who were beyond the reach of "trickle-down" benefits. Despite its effectiveness as a short-term aid measure, this approach often fell short of achieving sufficient medium- and long-term results.²

(3) Emphasis on food self-sufficiency (production system) (from 1975)

Famine in the Sahel and Ethiopia as the result of a drought that had continued since the 1970s led to a growing interest in food security, spawning a trend that focused on another antithesis, namely food self-sufficiency (production system). In reality, however, the policy was carried out to provide inexpensive food to urban areas, and in many cases did not result in increased farmer incomes.

Incidentally, since the mid-1960s, the Green Revolution,³ which was focused on the introduction of high-yield varieties of grain, has led to the introduction of agricultural production processes that apply science to the biological production process for continuous, uninterrupted improvements in crops. Throughout this period, in addition to the introduction of high-yield varieties and production materials such as agrochemicals, chemical fertilizer and agricultural machinery, irrigation facilities and other agricultural infrastructure were also improved, and production of staple foods like wheat and paddy rice increased dramatically. The Green Revolution had a radical impact on developing countries, having the effect of transferring the modern growth process to agriculture and rural communities there. At the same time, it also resulted in the "Farming System Research" being developed, a study of regional agricultural and farm management systems.

¹ The following text has been revised on the basis of JICA (2001b) pp. 1-3.

² The following main causes are cited: (1) In reality, it is politically difficult to narrow down the target to the poor (political parties or local governments to represent them do not often exist), and identifying the poor entails technical costs. (2) It was difficult to find the driving force for short- and medium-term growth, and attempts to attain such growth often did not have fiscal support. (3) Even when the living standards of the poor improved slightly, the wealthy benefited much fast because of the top-down development policies of the donor countries and, as a result, the gap between rich and poor widened further.

³ The "Green Revolution" refers to increases in the production of wheat, rice and other agricultural products, which was achieved by Mexico and developing countries in Asia in the 1950s and 1960s through the development and introduction of high-yield varieties. Materials such as fertilizer and agrochemicals as well as the supply of water by irrigation are necessary for producing high yields.

(4) Structural adjustment policies: Change in the approach to sustainable development (1980s)

Environmental changes like declining primary-product prices and stagnation in demand stemming from a slowdown in the economies of developed countries brought to the surface structural problems that had remained unnoticed hidden in the shadows of economic growth. Beginning in the 1980s, debt problems prompted the introduction of structural adjustment policies.

Structural adjustment benefited the poor to a degree by holding down inflation, improving overseas competitiveness through lower foreign exchange rates and invigorating agricultural markets through privatization of state-run agricultural corporations. In the short term, however, criticism grew that it often also brought unfavorable results especially to the poor, such as the abolishment of food subsidies, rising costs of public utilities including public transportation and cuts in education and medical budgets. As a result of the curtailment and abolishment of various agricultural services, the weakening of dissemination systems has been a serious problem for agricultural development in many developing countries which continues to this day. Particularly in Africa, farms have been unable to appropriately deal with the rapid change, and even now their rate of grain self-sufficiency is continuing to decline.

(5) Participatory rural development approach (1990s)

As financial aid to developing countries dwindled, more effective rural development methods were explored, while learning from past mistakes and experiences. For instance, as a result of: (1) the fostering of ownership by local residents and governments; (2) support for measures to improve residents' awareness of problems and to strengthen planning and implementation capabilities; and (3) the promotion of plans for decentralization of authority, the division of roles for different organizations has progressed, with central governments formulating and adjusting policies and local governments implementing them.

Common to this series of developments is a stance of supporting people in recipient countries to involve themselves from the initial stages of cooperation, from becoming aware of the issues and problems they face, to getting them to take responsibility for developing, implementing and monitoring programs. Here, hopes grew that community based organizations would replace not only governments in recipient countries but also government functions that had been steadily shrinking.

Against this background emerged a participatory approach in which residents identified the problems facing their local community, considered solution strategies for addressing these problems, and then formulated and implemented corresponding action plans. In the 1990s, in conjunction with the democratization of politics and the liberalization of economies, the participatory approach had already become the generally accepted mainstream approach adopted by donor countries, international organizations, international NGOs and local NGOs, regardless of the countries involved.

(6) Response to the advance of globalization (2000s)

Amid rapid progress in the globalization of human and economic activities, although there have been benefits such as growth of the world economy and raised living standards, the disparity between rich and poor countries and the disparity between the rich and poor within the same country have widened. Also, the importance of cross-border issues like international organized crime and the spread of HIV/AIDS as well as energy-related problems and global environmental issues like global warming and destruction of the ozone layer has grown. Furthermore, the collapse of the Cold War structure has led to frequent outbreaks of conflict, and the problems of human rights violations, refugees and internally displaced persons have come to light in many parts of the world. In agriculture, responding to globalization is not all about simply improving productivity. There are a wide range of other issues that need to be addressed, such as the development of systems for quality, safety, distribution infrastructure and commercialization support. In addition, developing countries faced direct competition from the agricultural products of developed countries backed by various kinds of substantial policy support, and as a consequence of the rapid advance of liberalization, many developing countries lapsed in the past half century to become net food importers.

In the midst of these developments sprang a school of thought that placed emphasis on the importance of protecting individuals from the threats against human survival, life and dignity and realizing the abundant possibilities they may possess. In other words, in addition to the traditional way of thinking about state security, "human security" that values the perspectives of each individual has come to play a more important role.⁴ The Commission on Human Security issued its final report in May, 2003.⁵

As stated at the outset, in conjunction with growing concerns over the supply and demand of food in the medium and long term as a consequence of the substantial rise in food prices since 2008, agricultural investment in developing countries by developed countries, medium-developed countries, nations in the Middle East and other countries harboring uncertainty about food self-sufficiency has increased. Moreover, there is also a growing view that more emphasis should be given to the growth industry aspects of agriculture in the agricultural development of developing countries.

Thus, the circumstances involving development and aid have changed along with the progress in globalization.

(7) Major international declarations, etc.

Here, we will briefly discuss the international declarations and major reports made in recent years.

At the World Summit on Social Development held in 1995, the "Copenhagen Declaration on Social Development" was adopted, setting the goals for attaining social development focused on human well-being and for halving absolute poverty in the world. The declaration refers to the eradication of hunger and undernourishment and to food security as the targets for efforts aimed at eliminating the fundamental causes of poverty.⁶

The Development Assistance Committee (DAC) Member Development Ministers of the Organization for Economic Cooperation and Development (OECD) adopted "Shaping the 21st Century: the Contribution of Development Cooperation" in May, 1996. DAC's new development strategy called for the proportion of people living in extreme poverty to be reduced by one-half the 1990 level by 2015, but it touched on agriculture and food only as the background for discussing poverty.

⁴ Ministry of Foreign Affairs of Japan (2002)

⁵ Commission on Human Security (2003)

⁶ UN (1995)

Meanwhile, the "Rome Declaration on World Food Security"⁷ adopted at the World Food Summit held in October 1996, "reaffirmed the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger" and pledged efforts to reduce the number of undernourished people to half by no later than 2015. The summit also agreed to pursue sustainable agriculture, fisheries, forestry and rural development policies as one of its commitments.

The UN Summit (Millennium Summit) was held in 2000. It adopted the Millennium Development Goals (MDGs) based on the international development goals that had been agreed upon in the past. One of the MDGs is the eradication of extreme poverty and hunger. The summit pledged to halve by 2015 the conditions of poverty and extreme hunger that existed in 1990.⁸

Following the September 11 terrorist attacks in the United States in 2001, there was a sudden heightening in awareness that, amid globalization, poverty in developing countries would become a hotbed of terror threatening the world's security. Because of this, the United States and European Union (EU) countries announced plans to increase ODA at the UN International Conference on Financing for Development held in Monterrey, Mexico, in March 2002.⁹

The World Food Summit: Five Years Later (WFS: fyl) held in 2002 reaffirmed the Rome Declaration. In addition, it recognized that not enough progress had been made to reach the WFS goals, and it expressed its determination to accelerate the implementation of the WFS Plan of Action to halve the number of undernourished people by no later than 2015. The summit also stressed the need for improvement of agricultural productivity and an increase in food production and allocation in order to achieve food security and poverty reduction.¹⁰

The "Johannesburg Declaration on Sustainable Development" adopted at the UN World Summit on Sustainable Development, which was held in South Africa in August 2002, cited food security, along with clean water, sanitation, proper housing, energy and health care, as one of the fundamental conditions for human dignity, and it expressed a determination to accelerate access to it.¹¹

The final report of the Commission on Human Security submitted in May 2003, took up hunger as one of the special challenges to human security, and it pointed to the need for a long-term approach to sustainable food production as well as to short-term emergency food aid.¹²

Following the UN Summit (Millennium Summit) in 2000, follow-up summits have been held at the UN every five years, namely in 2005 and again in 2010. In addition to confirming solid achievement of the Millennium Development Goals, including eradication of extreme poverty and hunger, discussion has looked at succeeding policies.

The World Summit on Food Security was held in November 2009 in response to the expectation that the number of undernourished people would exceed the 1 billion mark before the end of 2009 for the

⁷ FAO (1996a)

⁸ UN (2000)

⁹ While the United States cited governance, education, health, economic policy and investment as the target areas for increased aid, the European Union made no references to any specific areas.

¹⁰ FAO (2002b)

¹¹ UN (2002)

¹² Commission on Human Security (2003) p.14

first time in human history due to the surge in food prices in 2008 and the subsequent economic crisis. Consensus was reached among all states that food security would continue to be raised as an important policy issue.

As has been observed above, major international conferences have taken up the reduction of poverty and the supply of food (food security) as important issues.

Particularly from about the time of the Food Summit in 2009, an increase in awareness for food security and agricultural development can be seen. For instance food security and agricultural investment were listed in agenda at the G8 Summit in L'Aquila, Italy and at other high level meetings, and food security was included as one of the key pillars of the "Multi-Year Action Plan" attached to the Seoul Development Consensus at the G20 Seoul Summit in November 2010.

1-3 Trends in Japan's assistance

Japan started providing development aid in the 1950s as part of post-war reparations or as an alternative to them.¹³ Initially, Japan's assistance for agricultural and rural development was focused on cooperation for rice-growing because this was a technical field in which it was able provide cooperation. In other words, Japan made contributions to food supplies in developing countries by transferring Japanese-style rice-growing techniques.

In the 1960s, as countries adopted policies for the dissemination of high-yield varieties (HYV), Japan's cooperation took on the form of helping governments to set up systems for the dissemination of rice-growing techniques by establishing agricultural (dissemination) centers and model farms. Also on the rise was Japan's cooperation for the establishment of irrigation systems and the use of agrochemicals and fertilizer needed for the Green Revolution.

In the 1970s, Japan attempted to shift from development focused around agricultural centers to regional agricultural development aimed at dissemination to regional areas. Later, Japan recognized that the infrastructure for agricultural technologies was still not fully developed in developing countries, and this meant that the effects of its cooperation were not spreading as intended. Based on this recognition, it also introduced cooperation in agricultural research.

Thus, up until the 1980s, Japan focused its assistance mainly on increasing food production through large-scale projects led by central ministries and agencies, which were designed to develop farmland and modernize agriculture and thereby spur economic growth. Its approach rested largely on agricultural development, which included improvements in infrastructure such as irrigation systems to increase food production, development of agricultural technology, guidance in farm management and associated transfers of technology to recipient government organizations. Instances of cooperation that encompassed other sectors from the perspective of developing rural areas were limited.

In the 1990s, however, there was a growing demand for a form of assistance that incorporated social factors in development aid. A pattern of aid surfaced which was focused on rural development, such as integrated agricultural/rural development, and which was aimed at sustainable and varied development promoted primarily by farmers.

Japan's aid in recent years has tended to be region-focused, such as the expansion of aid to local

¹³ Details on the changes in Japan's overall technical cooperation are available in JICA (1999).

governments, and has increasingly come to cover multiple sectors based on the active introduction of participatory development. For effective implementation, Japan needs to carry out varied projects comprehensively, and in recent years, it has been trying to be more flexible in providing aid.¹⁴

In October 2008, the new JICA was launched after the integration of the Japan Bank for International Cooperation (JBIC)'s Overseas Economic Cooperation Operations (yen-loan ODA) with JICA. With this, Japan's three modalities of assistance—namely, technical cooperation, loan aid and grant aid—are being provided in a unified manner.

¹⁴ For example, in recent years, when national- or regional-level plans for agricultural and rural development are drawn up in development studies, often village-level verification studies are conducted on a wide range of areas, including agriculture, small-scale commerce and industry, health care, basic services and literacy education.

Chapter 2 Effective Approaches to Agricultural and Rural Development

2-1 Objectives of cooperation in agricultural and rural development

As has been observed in Chapter 1, the objective of cooperation in agricultural and rural development is to provide a stable supply of food to both rural and urban residents, reduce poverty in rural areas, and promote national and regional economic development.

Sustainable agricultural production is the basis for stable food supply. It is also an important component in promoting agriculture and rural areas and in eradicating poverty in those areas.

On the basis of these perspectives, we have established three Development Strategy Objectives (see Figure 2-1).

Development Objective 1: Sustainable Agricultural Production

In attempting to ensure food security on a national level, including urban residents, it is important to obtain and maintain¹⁵ a certain degree of domestic production capacity in conjunction with imports and reserves. Also, in many developing countries, agriculture holds an important position in spurring national economic development and acquiring foreign currency.

In rural areas, increasing and stabilizing the production of basic foods is a prerequisite for eliminating food shortages, and agricultural production occupies an important position as an economic activity for eradicating poverty.

In any case, agricultural productivity needs to be promoted and maintained in a way that is sustainable for a long time.¹⁶ In other words, sustainable agricultural production is a pre-condition for stable food supply and promotion of dynamic rural communities.

Development Objective 2: Stable Food Supply

Ensuring food security for an entire country, including urban areas, is based on a combination of stabilizing and improving its own domestic agricultural production, plus securing stable sources of imports and storing appropriate levels of reserves. Improvements in policies, rules, regulations and systems as well as improvements in infrastructure like transportation and storage facilities are also required in order to supply imported or locally produced food to consumers.

As seen above, ensuring and maintaining a capacity for sustainable agricultural production is the basis for a stable food supply. Here, any approaches to stable food supply that are not included in Development Objective 1 have been grouped into Development Objective 2.

¹⁵ It requires a high degree of political judgment to decide how much domestic production capacity should be maintained from the perspective of food security.

¹⁶ Based on an unfavorable review of high-input agriculture, some people call low-input and environmentally friendly agriculture sustainable. In addition to environmental considerations, however, economic viability (economic sustainability) and contributions to social development (social sustainability) are necessary. The Johannesburg Declaration (2002) states that economic development, social development and protection of the environment are the three pillars of sustainable development.

Development Objective 3: Promoting Dynamic Rural Communities

To eradicate poverty in rural areas and promote dynamic rural communities, it is important to step up the empowerment of local residents, such as by promoting a variety of economic activities like handicrafts and other small businesses, improving and organizing rural infrastructure such as community roads and drinking water supply, and raising health and education standards. This is all in addition to improving agricultural production and utilizing and selling agricultural products. Directly benefiting rural residents is also important from the perspective of achieving human security.

Although sustainable agricultural production is an important element for any attempt to promote dynamic rural communities, here, any approaches to sustainable agricultural production that are not included in Development Objective 1 have been grouped into Development Objective 3.



Source: Revision of a figure contained in "Approaches for Systematic Planning of Development Projects"



So-called "agricultural development" represents an attempt to attain Development Objective 2 on the basis of Development Objective 1, and "rural development" an attempt to achieve Development Objective 3 while incorporating Objective 1.

Needless to say, conditions in each country and region are broadly different, and it is necessary to accurately assess those divergent conditions in interpreting the development objectives and mid-term objectives.

Reference 2-1: Basic approach to examining aid policies for each country/region (primarily matters relating to agricultural production)

<Basic approach>

In formulating assistance policies for each country, first, determine the overall direction by: 1) evaluating the country's stage of development (time axis); and then 2) evaluating the region-specific farming situations within each country (space axis). +-

* The details of actual activities undertaken in the field for agricultural support are based on the view that, generally speaking, they can be decided according to two factors: items to be introduced (grain, vegetables, fruit, livestock) and purpose of introduction (self-sufficiency/sale).

1) Evaluating a country's stage of development (time axis)

- ✓ Assuming that agriculture in many countries is gradually shifting from "subsistence agriculture" to "commercial agriculture," classify development according to the three stages of "subsistence," "post-subsistence" and "commercial production."
- The classification of "subsistence" and "post-subsistence" is evaluated as follows.
 Determined according to the change in the country's self-sufficiency ratio for major grains for about the past five years
- ✓ The classification of "post-subsistence" and "commercial production" is evaluated as follows. Determined according to the following figures for about the past ten years:

Change in demand for commercial crops: Change in the production volume, import volume and

area of land under cultivation for crops other than major grains

Change in demand structure: Change in the per-capita volume of food supply for each item

Change in the labor population in non-agricultural sectors

- Reason for making self-sufficiency ratio a benchmark: Agricultural development requires investment in infrastructure, technology and labor. However, "subsistence agriculture" does not produce an income and so without being able to make these investments, it is a major constraint to agricultural development. Therefore, classifying development into pre-subsistence and post-subsistence seems fairly reasonable.
- Reason for classifying post-subsistence into two stages: A region that has achieved self-sufficiency does not necessarily switch over to commercial agriculture straight away. A consumer base first needs to develop. The transition can be described as:

Rural area achieves self-sufficiency \rightarrow Surplus labor is formed \rightarrow Labor moves to work in other industries \rightarrow Demand for agricultural products increases in line with economic growth of these workers. Considering the time required for each of these processes, this period of development was divided into two stages: "post-subsistence" and "commercial production."

2) Evaluating regional characteristics within a country (space axis)

- ✓ The relationship between agriculture and locality is evaluated according to the following five classifications: Suburban agriculture (high value-adding), grain growing (large-scale, low-cost), vegetable/fruit growing (right crop for the right land), local specialty products, and disadvantaged areas. Agriculture in many countries and regions appears to be one or a combination of these five types.
- Classification system for the five types (based on the following indicators)
 Verify the area of land under cultivation and the production volume for each item in each region.
 Extract the priority regions and issues based on the social conditions of each region (level of poverty, famine conditions, etc.).

Stage of development		Farmers		Flow of goods		Consumers/users
Subsistence production	✓ ✓	Greatest goal for agriculture is self-sufficiency for own family (ensure stable production of required amount, unaffected by weather or disease). The majority of agricultural land is used for growing subsistence grain crops, growing vegetables in small plots, and rearing livestock on a small scale. Gives to relatives or sells to neighbors only if there are surplus grops.	✓ N ∨ ✓ (✓ I U c	Main places of sale: Within the local village, neighboring villages Competitors: None in particular Distributors: Almost non-existent sually, farmers take their own surplus crops for sale at neighboring markets.	V	At this stage of development, the number of farmers per head of population is high, and the demand for agricultural products is low.
Post-subsistence (in transition to commercial agriculture)	 ✓ 	Production is stable, and has achieved self-sufficiency for own family almost always; able to sell a small amount of agricultural products every year (primarily grain crops). Some farmers take land that they had previously used for grain production and assign it to the production of vegetables for sale. (However, most important goal is food self-sufficiency for own family.)	✓ ✓ ✓	 Main places of sale: Major cities within the region Competitors: Neighboring farming villages Distributors: As the distribution of agricultural products from rural areas to urban areas increases, some farmers with the means for transportation or post-harvest processing commence operations as distributors. Usually, distributors of high-demand staple crops (grain, etc.) develop first. Distributors of commercial crops (vegetables, etc.) are uncommon at this stage. (Since the infrastructure necessary for 	* *	As agricultural productivity improves, there is surplus labor in rural areas, and sometimes this surplus labor begins to move to urban areas. In conjunction with this, demand for agricultural products also increases. However, consumers place importance on "securing the required amount at a low price," and so quality is hardly ever evaluated.

Table 2-1 Different perspectives of agricultural development according to the stage of development

				post-harvest processing, storage and		
				other processes vary for grain, livestock		
				products and vegetables, it is usual for		
				separate distributors to develop.)		
Commercial	✓	There is an increase in farmers who	\checkmark	Main places of sale: In addition to	✓	As cities grow and the non-agricultural
production		engage exclusively in grain, vegetables		neighboring cities, sales also target		population increases, demand also
(Polarization of		or livestock, and the relative importance		capital regions and export markets		increases and distribution systems
producing areas:		of subsistence agriculture decreases.	\checkmark	Competitors: Chief producing districts		develop.
competitive	\checkmark	Complete grain self-sufficiency is		in same country and overseas	\checkmark	Growth of the middle class in urban
growing districts/		achieved, and some countries	\checkmark	Distributors: Distribution is primarily		areas leads to changes in the demand
mostly		experience the problem of falling prices		performed by businesses engaged		structure:
subsistence		due to overproduction.		exclusively in distribution. (A new issue		(1) Diet of mainly grain crops \rightarrow
growing districts)	\checkmark	Depending on the product, some		is the fair sharing of profits among		Increased ingestion of animal food
		countries also experience the problem		farmers and distributors.)		products, etc.
		of competition with less expensive				\rightarrow Demand for vegetables, fruit and
		imported goods.				livestock increases
	\checkmark	Therefore, production needs to be				(2) Increase in demand for the quality
		focused on both quality and price.				of agricultural products, such as
						flavor, appearance and safety
					✓	In addition to ordinary consumers, there
						is an increase in consumption/sale
						patterns, such as the food service
						industry and large supermarkets.



* This figure shows the typical stages of agricultural and rural development, and the characteristics of each. It is not intended to be a perspective that all rural areas and regions should follow this

course of development.



	Characteristics of growing districts				
	Greatest advantage is its proximity	(1) Production costs: Wages and land rent are high.			
	to large consumer population. On	(2) Transportation costs: Low (close to consumers)			
	the other hand, land is expensive	(3) Production infrastructure			
	and the labor force is weak.	 Production is often carried out on limited areas of land, and primarily using intensive forms of cultivation 			
Urban neighborhoods		\checkmark Has advantage in terms of producing vegetables that do not keep well			
[High value-adding]		(4) Places of sale: General workers, wealthy classes and the food service industry in urban areas			
		(5) Main products (small-lot, high value-adding products are common)			
		 ✓ Vegetables that are hard to keep fresh, intensive livestock industries (meat, dairy products, etc.) 			
		\checkmark Poor at grain production based on economies of scale			
		(6) Other			
	Land and labor are inexpensive.	(1) Production costs: Wages and land rent are low.			
	Access to markets is relatively	(2) Transportation costs: Relatively good, although not as good as for suburban agriculture.			
	good.	(3) Production infrastructure			
	In low-lying plains, access to water	\checkmark Making good use of production conditions different to urban areas (inexpensive land and			
Plains	resources is relatively good.	labor, relatively abundant water resources), produces grain at a low cost based on			
[Grain growing]	In some industrialized countries	economies of scale.			
	and regions, there are apparent	(4) Places of sale: Rural areas and general workers in major cities			
	shifts from agriculture to other	(5) Main products			
	industries.	✓ Low-margin, high-turnover products are common, such as grain.			
		(6) Other			
	Land and labor are inexpensive,	(1) Production costs: Wages and land rent are low.			
Highlands	but market access is problematic.	(2) Transportation costs: Generally high (consumers are far away; there are differences in			
[Vegetable/fruit	Different from low-lying lands, its	altitude).			
growing]	strength is its cool weather	(3) Production infrastructure			
	conditions	\checkmark Make good use of climatic conditions that differ from urban areas to produce distinctive			

Table 2-2 Different perspectives of agricultural development according to geographical conditions

		products (fruit, vegetables).				
		✓ Make good use of climatic conditions that differ from urban areas, and adjust the timing of				
		shipments				
		(4) Places of sale: Rural areas and general workers in major cities				
		(5) Main products				
		\checkmark Products which make good use of their advantageous weather conditions, such as				
		vegetables and fruit				
		\checkmark By varying the timing of shipments, there is potential for profitable sales even for the same				
		products that are grown on the plains.				
		(6) Other				
	Labor is inexpensive, but market	(1) Production costs: Wages are low, but because land conditions are poor, labor productivity is				
	access is problematic.	low.				
	Land is inexpensive. But working	(2) Transportation costs: Generally high (consumers are far away; market access is poorest).				
	on sloping terrain is inefficient,	(3) Production infrastructure				
	and the inability to acquire	\checkmark Since labor productivity and market access are poor, unless products with distinctive				
	substantial parcels of land is an	characteristics can be produced, there is no potential for market competitiveness.				
Mountainous areas	issue for farming.	\checkmark Make good use of climatic conditions that differ from urban areas to produce distinctive				
[Local specialty	Different from low-lying lands, its	products (fruit, vegetables).				
products	strength is its cool weather	\checkmark Make good use of climatic conditions that differ from urban areas, and adjust the timing of				
products	conditions	shipments				
		(4) Places of sale: Rural areas and general workers in major cities				
		(5) Main products				
		\checkmark Products which make good use of their advantageous weather conditions, such as				
		vegetables, fruit and extensively farmed livestock (One Village One Product (OVOP)				
		approach)				
		(6) Other				

Disadvantaged areas [Social policy]	Market access is particularly poor, and these areas have not distinctive features to give them a comparative advantage over other regions. Some areas are close to marginal land for agricultural production, and so productivity is low and unstable. Land is limited in mountainous areas, and the potential to develop it into agricultural land is also low.
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Time axis	Subsistence production	Post-subsistence (in transition to commercial agriculture)	Commercial production
	Using the following approaches, first	✓ First, ensure grain self-sufficiency at	✓ Provide technical support for
	improve the self-sufficiency ratio within	the household level and at the	small-lot, high value-adding
	the local area.	regional level, and then provide	production
	✓ Increase production volume	support that will lead to commercial	\rightarrow Improve cultivation
	especially for grain crops	production in the future, such as by	management, introduce superior
	\rightarrow Expand area of land under	increasing the number of products	varieties
	cultivation	(vegetables, etc.).	\rightarrow Introduce intensive-farming
	\rightarrow Improve the yield	✓ Provide support for the development	technologies, such as protected
	\checkmark Products are subsistence crops, and	of technology to regions with	cultivation
Urban neighborhoods	so farmers cannot bear costs.	potential for commercial crops, such	\rightarrow Improve post-harvest processing
[High value-adding]	Respond as follows at expense of	as establishing techniques for the	in order to improve quality
	government:	selection and cultivation of products	✓ Provide technical support to improve
	\rightarrow Introduce irrigation	suited to the region.	marketing
	\rightarrow Nurture and disseminate superior		✓ Introduce new varieties to encourage
	varieties		local specialty products
	\rightarrow Improve access to agricultural		 ✓ Adjust the timing of shipments
	materials using Food Security		(improve the varieties and cultivation
	Project for Underprivileged		methods (protected cultivation, etc.))
	Farmers (2KR)		\checkmark Through processing, improve e
			preservation and add value

Table 2-3 Possible policy options

Time axis	Subsistence production	Post-subsistence (in transition to commercial agriculture)	Commercial production
Plains [Grain growing]	 ✓ Implement the above approaches in a concentrated manner as a base for grain production. ✓ Support post-harvest processing and distribution infrastructure with timing that improves productivity. 	 Further strengthen grain productivity for the purpose of securing a stable supply of inexpensive food at the national level (measures for meteorological disasters and pest control, etc.). Since a certain proportion of agricultural products can be expected to be sold, consideration could also be given to introducing technologies that require a certain amount of labor and/or costs (fertilizer, agrochemicals, facilities for post-harvest processing, etc.). Provide support for organization and post-harvest processing as an approach for improving grain distribution. 	 ✓ Provide technical support for low-margin, high-turnover production → Generate higher yields by means of irrigation, fertilizers and plant variety → Reduce labor through the introduction of machinery ✓ Improve market access → Improve roads and distribution systems
Time axis	Subsistence production	Post-subsistence (in transition to commercial agriculture)	Commercial production
---	---	--	--
Highlands [Vegetable/fruit growing]	 ✓ Using the same approaches as for urban neighborhoods, first improve the self-sufficiency ratio within the local area. 	 ✓ Use the same approaches as for urban neighborhoods. ✓ Provide intensive support as a base for commercial crop production. 	 ✓ Use the same approaches as for urban neighborhoods. ✓ Improve market access → Improve roads and distribution systems
Mountainous areas [Local specialty products]	 Using the same approaches as for urban neighborhoods, first improve the self-sufficiency ratio within the local area. Prioritize support for improving 		 ✓ Use the same approaches as for urban neighborhoods. ✓ Improve market access → Improve roads and distribution systems
Disadvantaged areas [Social policy]	productivity to regions with a low self-sufficiency ratio.	 Provide support for initiatives that could lead to local specialty products. Strengthen support for ensuring low-input grain self-sufficiency (agriculture based on the use of local resources) 	 ✓ Promote "agriculture as a social policy," rather than "agriculture as an industry" (security for a minimum standard of living). ✓ Secure employment through the development of industries in urban areas (migrant labor).

Shaded areas indicate the priority regions for each stage along the time axis.

2-2 Cooperation issues in agricultural and rural development, and JICA's activities

Development Objective 1: Sustainable Agricultural Production

Mid-Term Objective 1-1: Capacity building for policy planning and implementation in the field of agricultural and rural development

- (1) Summary of concept
 - 1) Scope of mid-term objective

For the purpose of "developing agriculture", "achieving food security", and through these, "revitalizing rural areas", first, obtain an accurate understanding of the present supply-demand conditions for agricultural products in the recipient country and the forecasts for future supply-demand conditions, as well as the potential for agricultural production and the agricultural labor force, and then appropriately identify the ideal direction for agriculture in that country, before mapping out an agricultural policy based on that direction and establishing systems aimed at realizing it. In the area of rural development in particular, get an overall understanding of the socio-economic conditions of rural residents and the potential for livelihood improvement and industry promotion, before identifying and analyzing effective policies and aid programs.

2) Specific details of cooperation activities

Support for policies in the field of agricultural and rural development can be conceptually classified into: (1) Support for legislation that serves as the basis for policies; (2) Support for improving systems and structures for implementing policies (organization, implementation regulations); (3) Support for formulating specific development plans (development strategy, mid-term plans, etc.); and (4) Support for building the capacity of government staff, etc. for policy implementation. Thus, policy support is involved in a wide range of areas, from support for downright policy planning to the development of human resources for implementing that policy.

3) Connection with other mid-term objectives

Mid-Term Objectives 2-1 "Formulating food supply/demand policy" and 3-1 "Promoting rural areas in response to decentralization"

- (2) Current state of JICA projects
 - 1) Support for legislation that serves as the basis for policies
 - There has been a decidedly small number of projects with a direct aim of legislation. (In the Capacity Building for the Quality Standard Control of Agricultural Materials, which is a current project underway in Cambodia (2009 to 2011), support is being provided for the formulation of legislation for regulating agrochemicals and fertilizers.)
 - In some cases, outputs of projects supporting the improvement of systems, such as

agricultural extension services, are consequently institutionalized, being incorporated into laws. ((Philippines) Training Services Enhancement Project for Rural Life Improvement (1996 to 2001))

- 2) Support for improving systems and structures for implementing policies
 - Technical Cooperation Project: (Pakistan) Irrigation Management Transfer/Water Management Expert (July 2006 to June 2009)

A technical cooperation project that combines training in Japan with the dispatch of experts providing technical advice for water management, maintenance of irrigation and drainage facilities and for the development and improvement of organizations and systems for water management

• Technical Cooperation Project: (Tanzania) Technical Cooperation in Capacity Development for the ASDP Monitoring and Evaluation System (March 2008 to February 2011)

In order to verify the effects of the Agricultural Sector Development Program (ASDP), working-level reports need to reach government ministries and agencies properly.

To this end, activities have been conducted aimed at improving the Agricultural Routine Data System (ARDS), by which information from villages reaches the central government, and at developing human resources for the operation of that system. Specifically, support has been provided to the ASDP M&E Thematic Working Group, in which five agriculture-related ministries and agencies participate, for consolidating the data needs of each ministry and agency, and for drafting a common format for reports that reach the central government from villages.

- 3) Support for formulating specific development plans
 - Loan Aid: (Indonesia) Development Policy Loans I to VI (Loan Agreement (L/A) signing date: 2005 to 2010)

Under this agreement, the Indonesian government sets "policy actions" for: (1) improving the investment climate, such as enhancing investment regulations and import/export procedures; (2) improving fiscal management, such as formulating a national budget that fully reflects the country's development plans; and (3) poverty reduction, such as paying grants for community development projects for the improvement of rural roads, and is provided with loans on successful achievement of these actions (cofinancing with the World Bank and the Asian Development Bank).

• Technical Cooperation Project: (Indonesia) Institutional Support for Food Security (March 2005 to February 2008)

For the purpose of strengthening the functions of the Agency for Food Security and other related organizations, improvements to food security systems needed to be facilitated and their strategic nature needed to be enhanced. To this end, policy formulation capabilities were increased and improvements were made to mechanisms for formulating and implementing policies, through the building of information management systems, the introduction of simulation and modeling techniques for social-scientific food supply/demand policies, as well as through comparative studies of food security policies and dialogue on food security policies.

- Also includes many studies on the formulation of master plans through technical cooperation for development planning, and feasibility studies performed through preparatory surveys.
- 4) Support for building the capacity of government staff, etc. for policy and system implementation
 - Often conducted in combination with 1) to 3), support is provided for the development of systems and guidelines and the formulation of development plans, as well as the development of human resources to undertake implementation of those systems and plans.
- (3) Issues in implementing projects

Compared to other industries, in agriculture it is harder to respond swiftly to changes in demand or to the introduction of new technologies. This is due to the length of time required between planting and harvesting and the fact that agriculture is significantly affected by the seasonal and natural conditions of the region. Sometimes, producing a certain level of results requires efforts lasting in the order of decades. Given this, in order to provide effective agricultural support, more than just short-term assistance for projects, consideration needs to be given to a program-based approach grounded on policy discussions. To this end, there is an urgent need for the development of human resources and for the building of systems for implementing projects which is suited to systemization.

In addition to the sweeping trend of trade liberalization that has enveloped the world in recent years, global agriculture has been faced with such problems as medium- and long-term responses to food issues, which have been of particular concern of late, and changes in the demand for food as a consequence of the burgeoning middle classes in countries in Southeast Asia, Central and South America and other regions (increased preference for high-quality, safe agricultural products). Countries around the world face difficult challenges requiring medium- and long-term responses. Japan has a history of addressing agricultural challenges similar to those faced by developing countries today. The nation experienced food scarcity following World War II, but subsequently restored its food self-sufficiency through improved productivity. Next, Japan experienced a shift in demand structure "from quantity to quality" as its income levels increased. It diversified production to meet these developments, and undertook initiatives to address globalization. Efforts are needed to systematically organize these experiences, and to make the most of Japan's advantage in this respect in providing support to developing countries.

Since policy planning is a core function and authority of government, and can be influenced by political trends, efforts need to be undertaken with prudence and with adequate systems in place, while taking the intentions of the recipient government into account. (4) Points for concern in extending cooperation

Given the issues outlined above, generating certain outputs with limited time and resources necessitates a program-based approach that accurately grasps the actual stage of agricultural development. In order to formulate such programs, policy dialogue needs to be held based on the medium- and long-term direction of agricultural development which is founded on a comprehensive and fair analysis of the present situation.

In pushing ahead with this policy dialogue, it may not necessarily be appropriate for Japan to act alone in leading this kind of support. Instead, it is important to proceed with support in a cooperative manner, in dialogue with United Nations organizations and other donors.

As an example of efforts by other donors for policy support, for the purpose of "continuing support for the Doha round,¹⁷ South-South trade and intraregional trade" with respect to the supply and demand of agricultural produce, the World Bank Group is committed to continuing its analytical work regarding: (1) international and regional agricultural trade reform; (2) international and regional taxation on agricultural products; and (3) macro-economic price effects on agricultural competitiveness.¹⁸ Furthermore, with respect to the prices of agricultural products, as part of its "development of policy options to address price volatility," the World Bank Group is focused on: (1) analysis of the growing volatility of grain prices; (2) analysis of the drivers of volatility, including biofuels, CIFs,¹⁹ trade policy and climate change; and (3) analysis of policy options at the international level to reduce negative impacts.

¹⁷ World Bank Group Agriculture Action Plan FY2010-2012

¹⁸ Multilateral trade negotiations, organized by the WTO since 2001 for the purpose of removing trade barriers

¹⁹ CIF: Commodity Index Funds

Mid-Term Objective 1-2: Improving, maintaining, conserving and managing production infrastructure

- (1) Summary of concept
 - 1) Scope of mid-term objective

Since rural communities are both a place of production and a place for living, improvement of "economic infrastructure" (irrigation and drainage facilities, development of farmland, soil conservation, etc.) and "social infrastructure" (rural roads, rural electrification, communication and information networks, public transportation networks, medical facilities, water supply and drainage facilities, etc.) needs to be done in an integrated fashion. Here, the objective is the effective establishment, maintenance and management of "economic infrastructure" that contributes to agricultural production.

The term "irrigation" refers to artificially supplying arable land with water which is necessary for the cultivation of crops.²⁰ Given that water resources (precipitation) are unevenly distributed from region to region, and seasonal variations are generally large in tropical (subtropical) regions, irrigation performs an important role in improving productivity by enabling the stable use of water.

The term "water management" refers to the series of integrated activities and actions related to irrigation and drainage, namely, the storage, intake, conveyance, distribution and drainage of water and the preservation of water quality; and in a narrow sense of the term, it refers to those activities and actions related to irrigation.²¹ Ordinarily, irrigation is carried out by many beneficiaries drawing, conveying and distributing water in a cooperative fashion, and so in a broad sense of the term, these actions can also be included in irrigation. Moreover, given that the construction and management of appropriate facilities for this purpose are important issues in irrigation, "irrigation" and "water management" are inseparable from each other.

The term "soil conservation" refers to the act of protecting agricultural land, forest land and other types of land from soil erosion, and preventing any decline or decrease in the functions of land.²² Soil erosion can be categorized into natural erosion attributable to water and wind, and accelerated erosion attributable to human activity such as tillage, deforestation and grazing.²³

2) Specific details of cooperation activities

Support is being provided for planning of the construction of facilities through technical cooperation, for construction of facilities through loan aid and grant aid, and for water management and maintenance through technical cooperation projects and technical cooperation for development planning.

²⁰ Technical Terms on Irrigation, Drainage and Reclamation

²¹ As above

²² As above

²³ Unabridged Dictionary of Agriculture

With regard to the "improvement of agricultural land", the productivity of agricultural land is improved, such as by easing the gradient of steep sloping terrain, drawing water for agricultural land, and removing gravel from agricultural land abound in gravel.

As for the "preservation of agricultural land", measures are implemented for protecting the land from devastation and disaster, specifically, measures for preventing soil erosion (wind erosion and water erosion caused by rainfall) and measures to counter soil contamination, floods, landslides and water quality problems.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-7 "Farmers' organizations" and 3-4 "Improving the rural living environment"

- (2) Current state of JICA projects
 - 1) Planning
 - Technical Cooperation for Development Planning: (Tanzania) The Study on the National Irrigation Master Plan (NIMP) (April 2002 to March 2004)

An irrigation development plan at the national level (Master Plan (M/P)) was formulated, following which, priority areas and priority issues were selected, and action plans formulated. Verification studies were performed on some of the schemes proposed in the action plans, and the results of these studies were fed back into the M/P to formulate a more practical M/P, thereby contributing to the stability/increase in food production in Tanzania.

• Technical Cooperation for Development Planning: (India) The Study on Diversified Agriculture for Enhanced Farm Income in the State of Himachal Pradesh (January 2007 to March 2009)

The objective of this development study was to clarify rural development strategies focused on crop diversification. A master plan was formulated, containing both "hard" and "soft" measures. Going forward, in addition to providing support through yen loans for the development of irrigation facilities and other infrastructure and for disseminating technology and otherwise extending the strengthening of farmer services to other districts within the same state in a way which brings the master plan to fruition, there are plans to utilize technical cooperation projects incidental to ODA loans to build the capacity of the implementing agency prior to provision of the yen loans.

- 2) Construction
 - Loan Aid: (Peru) Sierra-Natural Resources Management and Poverty Alleviation Project (III) (L/A signing date: September 4, 2000)

The aim of this project was to strengthen community-based organizations, improve

the living environment and improve the infrastructure for production activities in villages, thereby establishing an environmentally friendly, highly productive agriculture industry. The project targeted 22 offices in the Andes region, and was to be achieved by using the participatory method in all processes, from project formulation to implementation, for rural infrastructure development sub-projects conducted in the villages under the jurisdiction of each office, including afforestation, the creation of arable land focused on soil conservation, the construction of small-scale facilities for irrigation and facilities for stockpiling agricultural produce, and assistance for the procurement of agricultural input goods. The proceeds of the loan were to be used for procuring materials, equipment and services necessary for the project as well as for consulting services (such as advisory services for maintenance and studies for evaluating effectiveness).

• Technical Cooperation Project: (Cambodia) Improvement of Agricultural River Basin Management and Development (TSC3) Project (September 2009 to August 2014)

All over Cambodia, various aid organizations are currently either providing or planning to provide support for the renovation and development of irrigation facilities, and in most of these aid programs, the planning, design and construction supervision are performed by consultants who are employed as part of the donor's project costs. Furthermore, there have been several cases of irrigation projects, where the planning on a basis of individual river basins has not been adequate, leading to concerns over problems arising in the future to do with the coordination of water use at the river basin level. Therefore, this project was implemented with an objective of improving the technical capabilities of irrigation technicians at central and local governments in the planning, surveying, design, construction and maintenance of facilities across entire irrigation systems.

- 3) Water management
 - Technical Cooperation Project: (Thailand) The Modernization of Water Management System Project (April 1, 1999 to September 30, 2005)

This project was implemented with an objective of Water User Groups (WUGs) in charge of operating and maintaining irrigation and drainage facilities at the field level being established, developed and strengthened, and of the Irrigation Department and WUGs cooperating in the operation and maintenance of irrigation and drainage facilities from the branch canal level onward. As a consequence, formulation of water allocation plans at the river basin level and water management by WUGs began to be conducted effectively, thereby contributing to an expanded acreage of dry-season field crops and an improvement in production.

• Technical Cooperation Project: (Malawi) The Development of Smallholder Irrigation Scheme Technical Cooperation Project (March 2006 to March 2009)

In Malawi, agriculture is a key industry, accounting for 39 percent of GDP and 80 percent of the total workforce, and so development of this industry is seen as important. In particular, improvement of agricultural productivity through irrigation is recognized as a priority issue for securing food and reducing poverty.

This project was implemented with the objective of the building of simple dams and canals by residents in local areas using available wood, bamboo, stones and other resources; and the national dissemination of small-scale irrigation technologies for maintaining and renovating facilities.

- 4) Maintenance
 - Loan Aid: (Pakistan) Punjab Irrigation System Improvement Project (L/A signing date: May 3, 2008)

The objective of this project is to improve agricultural productivity by reforming irrigation facilities centered on tertiary waterways and water resources management facilities, supporting the formation and development of farmers' organizations, as well as by providing support for management related to the preservation of groundwater, thereby contributing to the poverty reduction.

The project includes provision of engineering work and services necessary for widening and reforming tertiary waterways for irrigation in the targeted zones in Punjab Province (Bahawalpur Irrigation Zone, Dera Ghazi Khan Irrigation Zone and Faisalabad Irrigation Zone)

- (1) Reform of tertiary waterways for irrigation in the relevant zones
- (2) Support for the establishment and development of farmers' organizations
- (3) Support for the improvement of groundwater management
- Loan Aid: (Indonesia) Participatory Irrigation Rehabilitation and Improvement Management Project (L/A signing date: March 28, 2008)

The objective of this project is to increase the production of rice in the western region of Indonesia (Java, Sumatra and Kalimantan islands) by improving and extending existing irrigation facilities and assisting in the development of maintenance systems, thereby contributing to the food security of Indonesia.

The project covers nine sub-projects supporting the improvement and extension of existing irrigation facilities and the development of maintenance systems.

- (3) Issues in implementing projects
 - 1) Planning capacity

There are cases where poor planning capacity for infrastructure development ends up acting as an impediment to the efficient development of infrastructure. Moreover, while budget deficits are a contributing factor, in particular, there are also countries where little importance is attached to the collection of meteorological and hydrological information necessary for planning the construction of irrigation and drainage facilities.

2) Construction of facilities

Standards for construction management are ambiguous. Moreover, given that donors do not provide opportunities to government technicians to participate in construction because they outsource to consultants and building contractors, and given the shortage of personnel, the capacity of government technicians for construction management is poor. Furthermore, two unresolved problems in introducing irrigation facilities are the significant costs involved in their introduction and that, without the facilities being maintained appropriately, there are no prospects of the effects being sustained.

3) Operation (water management)

The main issues relating to operations include a lack of cooperation between stakeholders involved in water management, a lack of awareness among the main actors within water management associations, and a lack of water management technology. There are also cases of immigrants not becoming permanently settled because, during the construction of terminal waterways, immigrants with no experience in irrigation are unable to access social security from the government.

4) Maintenance systems

The main problems relating to maintenance systems include that the boundaries of responsibility for maintenance are unclear, and that information on the facilities subject to maintenance is not centrally managed. Moreover, particularly with facilities whose management is contracted out to water management associations, the collection rate of water charges to be allocated for maintenance is low, and their administrative ability is poor, and therefore, maintenance is not carried out appropriately.

- (4) Points for concern in extending cooperation
 - 1) Planning capacity

In order to promote effective irrigation development, basic meteorological, hydrological, pedological and other kinds of information need to be collected and accumulated, and appropriate facilities need to be designed based on this information. In order to strengthen these abilities, care needs to be taken so that technology is transferred to partner country organizations, while accumulating data such as through technical cooperation for development planning and while developing guidelines on the design of facilities such as through technical cooperation projects.

2) Construction of facilities

When cost-effectiveness and maintenance are taken into account, rather than carrying out high-level infrastructure development, consideration could instead be given to the development of facilities of a scale that is easy to maintain. Moreover, in cases where it is more effective to emphasize the wide-area expansion of projects, with irrigation facilities for instance, the construction of large-scale concrete structures should be avoided, and instead, consideration could be given to such techniques as constructing earthen waterways based on resident participation. Constructing relatively low-level facilities in multiple locations on the presumption that rural residents will provide labor and locally available technology will be used will lead to sustainability. However, facilities with low maintenance levels tend to be avoided by irrigation engineers, and therefore a challenge is that they are not readily requested by government departments in charge of irrigation.

In Cambodia, there are plans to provide effective support for improving the livelihoods of farmers through appropriate irrigation development and water management at irrigation facilities, by utilizing financial aid (loan aid) and technical cooperation in an integrated fashion to provide support for constructing new and repairing existing irrigation and drainage facilities ("hard" aspects) and for building capacity for irrigation management and improving farm management skills ("soft" aspects).

3) Water management, 4) Maintenance systems

Organizing farmers

Populations are expected to continue increasing, especially in developing countries, and so in order to secure food production corresponding to this population growth, it is crucial that irrigation facilities be improved and maintained in line with other circumstances and social developments. When doing so, in addition to improving "hard" aspects, such as properly maintaining and repairing water resources facilities and water-use facilities, this must also be accompanied by the proper management of irrigation water (water management). Two prerequisites for proper water management are the organization of farmers (establishment of irrigation associations) and the development of those organizations carrying out water management.

Infrastructure development based on farmer participation

In improving economic infrastructure in rural areas (particularly, irrigation facilities), in view of the importance of maintenance once those facilities are complete, it is important that beneficiary farmers take ownership. To this end, it is important to make farmers fully aware of irrigation by having them participate in the project from its planning stage. In Japan, for more than three hundred years, responsibility for managing irrigation facilities has almost always rested with farmers, and farmers have been levied to fully fund management of those facilities. Analyzing and standardizing Japan's experience and putting it to good use is worth considering.

Furthermore, in developing irrigation in the future, conventional economic efficiency is more important than technological factors. Moreover, for modern irrigation facilities to prove effective, it needs to be recognized that social change and change in the mindset of farmers are necessary, as is adequate economic and technical assistance to achieve these changes. For this purpose, it is important to extensively utilize Participatory Rural Appraisal (PRA). On the other hand, meeting the wishes of residents is not always technologically feasible. The technological support of technicians on the part of administrations is needed in order to carry out appropriate infrastructure development. Establishment of service centers for the maintenance of irrigation

Although responsibility for the maintenance of irrigation facilities shifts to beneficiary farmer groups as part of the IMT (Irrigation Management Transfer) process, administrative bodies need to provide appropriate services for the maintenance of principal irrigation channels, headworks and other facilities that farmer groups are unable to handle. Efforts are needed for the construction of support structures for this purpose.

Farming support

Particularly in cases where improvements are made to irrigation and drainage facilities, getting farmers to practice irrigated agriculture in the beneficiary districts will enable them to generate enough profit to pay for maintenance costs, which is also important from the perspective of maintaining the facilities. Therefore, in addition to providing support for infrastructure, providing support related to agricultural extension (linkage with production) is also effective.

5) Environmental and social considerations

While not exclusive to production infrastructure, projects predominantly related to the construction of facilities are implemented in accordance with the JICA Guidelines for Environmental and Social Consideration.

6) Other

As previously described, producing effects in economic infrastructure centered on irrigation and drainage facilities requires each element, such as data collection, design, construction, management and farming to fully function. Consideration needs to be given to providing support from a long-term perspective by systemizing the set of support measures.

Mid-Term Objective 1- 2, Reference 1: Land use and soil conservation

The term "soil conservation" is the act of protecting agricultural land, forest land and other types of land from soil erosion, and preventing any decline or decrease in the functions of land. Furthermore, soil erosion can be categorized into natural erosion attributable to water and wind, and accelerated erosion attributable to human activity such as tillage, deforestation and grazing.

Luxuriant forests and paddy fields moderate temperature and humidity, and have a considerable environmental buffer capacity. Even in arid areas, forests are a massive space for regulating water resources, thereby preventing soil erosion and floods. In this way, agricultural and forest lands have many functions besides agricultural production, including the retention of water resources and the purification of water quality, and thus it is important to combine these well with land use.

Two features of land use in tropical rain forest areas, such as those in Africa and Southeast Asia, is the slash-and-burn method of agriculture and agricultural production systems that combine forest land and agricultural land. Soil in the tropics is, however, characteristically

limited in organic matter. Development of forest land easily leads to water erosion and surface soil loss poses a problem for many sloping agricultural lands.

On the other hand, in arid areas (including semi-arid areas), which are said to account for two-thirds of the world, securing water resources is a prerequisite for using agricultural land. Recently, research has been conducted on land-use technology for changing desert into forest land and agricultural land through the examination and introduction of various water catchment technology.

Paddy fields in low-lying areas not only enjoy high productivity, but provide an outstanding system of sustainable food production. In comparison, the question of how to increase and stabilize the productivity of dry field farming in tablelands is the most significant issue for land use in tropical and subtropical regions. The biggest agricultural problem posed by soil erosion here is aridification, or the loss of relatively nutrient-rich topsoil. Moreover, assuming there are no prospects for the input of fertilizers and other materials from outside organizations, then the runoff of topsoil and organic matter due to erosion will lead directly to a decrease in productivity. Without any appropriate action, notable topographical changes will appear, and if reductions in yield are realized, it will take a lot of effort to restore conditions, or farmers will be forced to abandon tilling the land. In the tropics, where aridification makes for fragile resource and environmental conditions, the phenomenon of soil erosion impairs the sustainability of actual production infrastructure. Therefore, appropriate land use based on an understanding of those mechanisms and processes is necessary, as are measures for soil conservation.

As for soil in lowlands, material lost through the erosion and leaching processes in the higher tablelands and mountainous areas which form the catchment area for the lowlands flow together with water and accumulate in the low-lying lands. Although there is loss of material due to erosion and leaching in the catchment area, since these are captured and enrich soil in the lowlands, there is also a distinctive fertility characteristic of helping to rejuvenate soil material in the long term and facilitating the maintenance of soil fertility. It should also be emphasized that the risk of low-lying soil eroding is small. When building paddy fields, land needs to be leveled and ridges or levees need to be built between fields, and this is arguably the best course of action for preventing erosion. Thus, paddy field agriculture can be described as an agricultural system that artificially reinforces the geological fertilization effect of alluvial soil being generated by river water.

Even in arid climates, farmland is being expanded involving the concentration of land use and irrigation, and so soil problems (halomorphic soil) can occasionally be seen. Irrigation is crucial for farming in arid areas, but at the same time, agriculture must be practiced which also gives consideration to drainage. Care needs to be taken so as to prevent irrigated farmland from being abandoned due to severe salination and to prevent farmers from being afflicted by declines in productivity due to salination. In other words, when contemplating irrigated agriculture in an arid climate, in addition to an irrigation plan, it is extremely important to make a plan which gives due consideration to regional drainage.

From the perspective of soil conservation, at present, there is no clear appropriate framework which encapsulates important soil and land use. Nevertheless, when considering soil conservation and land use, it is important to first fully ascertain the diverse natural and social conditions of each region before giving consideration to measures which are suitable to those respective conditions. Furthermore, in order to enhance the effectiveness of a plan, it is important to involve the whole community in tackling the management of agricultural resources.

In humid tropical areas, structures for sustainable and stable dry field farming have not been established. The main reasons for this are disease and insect damage, plus the many requirements for managing the fertility, physical and biological properties of soil. A key challenge, therefore, is to consider how soil ought to be managed so as to make dry field farming sustainable.

Desertification in arid areas (semi-arid areas) is known to be attributable more to overcultivating, overgrazing and the otherwise improper use of land by humans than due to climatic aridification. Basically, it is important to properly evaluate the capacity of soil to maintain humans and animals, and then to promote cooperation for its appropriate use.

In developed countries as well, based on reflection of excessively energy-intensive farming methods, signs can be seen of an inclination toward Low-input Sustainable Agriculture (LISA).²⁴ In developing countries, although it seems efforts for the intensive farming will be needed for some time to come, even as part of this process, technology systems should be explored which are conscious of harmony between production and the environment. Soil conservation and land use will be an important aspect of this.

Mid-Term Objective 1- 2, Reference 2: Water management

Generally speaking, irrigation can be classified according to its size, namely: large-scale irrigation, medium-scale irrigation and small-scale irrigation. Standards for classification vary widely from country to country, such as the volume of the water supply, the size of the irrigated area, the capacity of the responsible organization and the scale of the working expenses, and so any common classification is difficult.

Thus far, projects have been conducted with a focus on so-called large- and medium-scale irrigation, especially in Asia. However, with large- and medium-scale irrigation, the initial investment and maintenance costs mount, the construction period is long (there is a long time before project outputs are achieved), and the environmental impact is substantial. In addition, cases have been seen where projects have not necessarily been completely effective because of the following:

- (1) Inefficient use of water (ratio of the actual irrigated area to the target irrigated area is small)
- (2) Loss of large amounts of water due to water conveyance along open water channels
- (3) Inadequate terminal water-use facilities and delays in cultivating fields
- (4) Degradation of arable land due to lack or excess of irrigation water (accumulation of salt due to inappropriate irrigation, etc.)
- (5) Immaturity of water resource management organizations, etc.

²⁴ "Low-input sustainable agriculture (LISA)" refers to a form of agriculture which attempts to increase the sustainability (permanency) of production, by minimizing the use of pesticides and other chemicals and by eliminating dependence on resources with questionable durability. As for plant nutrients, in addition to emphasizing the recycling of materials LISA focuses on replenishing nitrogen by rotating crops and using green manure made from legumes. (Excerpt from the Technicians Handbook on Fertilization Diagnosis, ZEN-NOH (National Federation of Agriculture Co-operative Associations))

In agricultural engineering projects in Japan, the core parts of large- and medium-scale irrigation systems (water sources located away from farms and water conveyance facilities) and the terminal parts (water-use facilities adjacent to farms) are operated under consistent management. However, in countries where responsibility for these two parts is assumed by different agencies, there is no chance of the valuable core facilities being put to good use in farming. As irrigation districts get larger and larger, water-supply systems tend to go far beyond the maintenance capacity of farmers. Also, poor coordination among irrigation-related organizations often results in water shortages in downstream sectors of irrigation districts.

Naturally though, if conditions allow, large- and medium-scale irrigation also has scope for being a reasonable option, but due to the challenges outlined above, there has been a renewed recognition for the effectiveness of small-scale irrigation. In countries where small-scale irrigation in particular has been traditionally used as the conventional technology in local areas, there is a strong chance that, through the fusion of new technology with long-standing wisdom and experience, small-scale irrigation will be an efficient irrigation technique adapted to the region.

In order for farmers to practice irrigated agriculture actively, it is important that there be a participatory course of action whereby farmers plan, construct, manage and use the irrigation themselves. In the case of small-scale irrigation, facilities are simple, with basically only a terminal system (water-use facilities adjacent to farms). Given that consistent water management can be achieved relatively easily from the water source to farms, and that there are close links to farming, this form of irrigation holds promise for the effective expansion of irrigated agriculture.

One feature of a farm irrigation project is that the ultimate beneficiaries of the project outputs are the individual farmers, and so it is imperative that technologies be realized which are easy for farmers to use. In other words, "community-based technology" premised on local materials and local labor is likely to be important for achieving results in irrigation. However, facilities with low maintenance levels tend to be avoided by irrigation engineers, and therefore a challenge is that they are not readily requested by government departments in charge of irrigation.

On the other hand, even in the case of large- and medium-scale irrigation, although it is crucial that irrigation water be supplied for core systems with even greater certainty under public management, water management technology expected to be used for management by farmers will need to be disseminated at terminal waterways where the water is used effectively.

It is also important to collect and evaluate information and knowledge on conventional technology and farmer ingenuity regarding water management conducted by farmers (irrigation associations). Moreover, at the planning stage, consideration needs to be given to coordination between irrigation and urban water use, and at the water-use stage, to measures for preventing eutrophication caused by farming in areas around the water source.

In the second half of the 1980s, water resource management organizations shifted from a "traditional" top-down approach by government to a "participatory" approach aimed at expanding project outcomes. Then, since the second half of the 1990s, for the purpose of ensuring sustainability following withdrawal of aid organizations, "self-supporting" rural development has become mainstream which also includes water management.

Mid-Term Objective 1- 2, Reference 3: Land policy

- In order to sustainably develop the initiative for improving the nutritional and living standards of local residents, which is being advanced through many agricultural development programs and projects, proper investment in and maintenance of agricultural land will become necessary. A factor that has a significant impact on this initiative is the "fair and efficient access to land."
- If no consideration is given to the land policy and land ownership situation or to appropriate strategies at the project design phase, none of the original goals may be achieved, or there could be adverse effects such as environmental degradation.
- On the other hand, to improve access to land, in addition to making difficult adjustments that include diverse stakeholders, efforts at the policy level are also needed, including the formulation and reform of laws and the building of systems for their enforcement. It also needs to be recognized that this is an extremely political and difficult process. When examining cooperation, consideration needs to be divided between: (1) support for the actual land system (support for agrarian reform), and (2) items to consider and address in terms of the land system and land ownership when conducting individual project.
- (1) Support aimed at improving the land system (support for agrarian reform)
 - $\sqrt{}$ In order to review land ownership and ensure fair and efficient access to agricultural land, many initiatives need to be promoted concurrently, including the coordination of diverse stakeholders, the development of legal, institutional and executive structures, and support for self-reliance to farmers who acquire new agricultural land. It is difficult for donors to get involved in any reconciliation of interests predicated on political leadership, and so examples of actual support include technical support for institution-building and improving systems, as well as technical and infrastructure support aimed at the independence of farmers.
 - \checkmark Examples can be seen in many countries of farmers acquiring new agricultural land who are unable to use that land efficiently and effectively because of the low level of technical and capital support, and who eventually end up relinquishing the land as a result of being reduced to poverty. In Japan, various initiatives were implemented from the perspective of maintaining and strengthening landed farmers following the agrarian reform after World War II, such as the improvement of agricultural technology, the improvement of agricultural land, the creation of small farmer organizations, a mutual aid system for dealing with natural disasters, and the restoration and control of land-owning/tenant-farming through the Agricultural Land Act. It is important to make use of these experiences in providing support to developing countries.
 - $\sqrt{}$ Two specific examples of support are the Agrarian Reform Infrastructure Support Project in the Philippines and the Project for Revitalization of the Deteriorated Environment in the Land Reform Areas through Integrated Agricultural Development in Thailand. There have also been cases of advice being provided by policy advisors dispatched to government organizations in the partner country.

- Support for agrarian reform in Southeast Asian countries
- (Philippines) Agrarian Reform Infrastructure Support Project, Phase I to Phase III

Since 1988, the Philippines government has, through the Department of Agrarian Reform, been implementing its Comprehensive Agrarian Reform Program with a focus on agrarian reform communities (ARCs, communities comprised of single or multiple *barangays* (villages) in which beneficiaries of the agrarian reform reside). In order to support the nationwide expansion of this program, JICA developed basic economic infrastructure (irrigation facilities, post-harvest processing facilities, access roads to markets, etc.) in the ARCs, and for more than ten years between 1995 (Phase I) and now (Phase III), has provided loan aid designed to improve agricultural productivity and increase farmer incomes.

• (Thailand) Project for Revitalization of the Deteriorated Environment in the Land Reform Areas through Integrated Agricultural Development

JICA provided comprehensive agricultural support to the poorest farmers in the land reform districts in northeastern Thailand for the purpose of stabilizing the lives of farmers and to prepare measures for the employment of residents returning to the villages as a consequence of the impact of the currency crisis.

- (2) Land policy considerations when designing and facilitating agricultural projects
 - 2) Environmental considerations
 - $\sqrt{}$ In cases where leases on agricultural land are short, tenant farmers will not set aside time or effort for initiatives that require a long period of time, such as soil improvement, the management of orcharding or the management of pastures. For this reason, consideration needs to be given, for instance, to lengthening leases or providing financial incentives for proper resource management.
 - 3) Gender considerations
 - $\sqrt{}$ Access by women to agricultural land has remained unequal and restrictive in many societies, and as land prices rise in tandem with economic growth, this access is tending to become even more limited.
 - $\sqrt{}$ On the other hand, women perform a very large role in agricultural production and in the provision of food at home in rural areas (80% of food production in the sub-Sahel, and 50-90% of labor in the production of rice in Asia). Thus there are examples where rights and responsibilities are out of balance.
 - $\sqrt{}$ In order to ameliorate this situation, gender-conscious reviews of legal and institutional systems need to be advanced while simultaneously raising awareness for women's rights. In projects, gender analyses need to be carried out at the design stage, and efforts need to be made to prevent the problems facing women and the

situations in which they are placed from being overlooked.

- 4) Reconciliation of interests in land ownership
 - \checkmark There are various forms of land ownership. Besides the lawful tenures of landed farmers, tenant farmers and loans of land from the state, there is also the common use of agricultural land, which was traditionally practiced in villages (common pastures, etc.), as well as unlawful residence on land. In cases where competitive relations arise in these varying forms of ownership such as due to the effects of revisions to the land system or law, rising land prices as a consequence of economic development, production pressures on agricultural land due to increases in population, or relocation as a consequence of land developments, coordination among stakeholders will be needed.
 - $\sqrt{}$ In relation to agricultural projects, it is conceivable that there will be friction among stakeholders as a consequence of relocations following land developments, new population pressures at the new locations, redistribution of rights over agricultural land and rising land prices. Thus, when conducting projects, there needs to be careful coordination, not only with the central and local governments that are implementing the project, but also with the other actual stakeholders.
- Taking other donors as an example, the World Bank Group for instance aims to stabilize land ownership and improve the land market by adopting a comprehensive approach, such as improving land laws and systems, taking consideration of customary but irregular land requirements, modernizing land management, redistributing land through due process, and mitigating conflicts over land.

Mid-Term Objective 1-3: Securing agricultural production equipment/materials, improving their use

- (1) Summary of concept
 - 1) Scope of mid-term objective

The main equipment and materials used in agricultural production are: agricultural machinery and equipment, seeds (including genetic resources), agrochemicals and fertilizers. The scope of this objective is for farmers to properly use these agricultural materials, and without having any adverse impacts on human health or the regional environment, to achieve such effects as increasing and stabilizing agricultural production, having farmers engage in work at the proper time, and reducing labor.

2) Specific details of cooperation activities

In terms of support for agricultural production equipment and materials, efforts are underway to improve access to good quality and inexpensive materials (development of systems for quality control, improved access for farmers using joint purchasing and small-scale financing, etc.), and to provide guidance on appropriate usage (establishment and guidance on safe and effective usage based on cultivation experiments, etc.).

3) Connection with other mid-term objectives

Mid-Term Objectives 1-4 "Promoting crop production," 1-7 "Farmers' organizations," 1-8 "Agricultural financing" and 3-2 "Improving non-farming income."

- (2) Current state of JICA projects
 - 1) Improving access to materials

In improving access to equipment and materials used in agricultural production, with a view to ensuring sustainability, support has been promoted for joint purchasing and small-scale financing through the creation of farmer organizations. Other promoted initiatives include two-step loans through loan aid, small-scale financing linked to Grant Aid for Underprivileged Farmers (2KR) counterpart funds and grass-roots grant aid, development of human resources in the area of farmer financing and organization through the acceptance of trainees, and the introduction of subsidies (for example: the fertilizer voucher system in Malawi).

• Loan Aid: (Paraguay) Agricultural Sector Strengthening Project II (L/A signing date: August 10, 1998)

This project is comprised of two parts: assistance for small-scale farmers led by the Ministry of Agriculture and Livestock (MAG), and assistance for medium-scale farmers extended by the National Development Bank (BNF). The former is further comprised of three sub-projects ((1) small-scale infrastructure improvements, (2) granting of capital investment funds to small-scale farmers, and (3) granting of

capital investment funds to farmers' organizations); and the latter involves the granting of operating funds through two-step loans to medium-scale farmers targeting the agriculture, livestock farming and agricultural processing sectors.

• Grant Aid: (Niger) Grant Aid for Underprivileged Farmers (2KR) (2009) (also provided in many other countries)

2KR is a form of assistance necessary for the purchase of agricultural machinery, fertilizer and other materials. Its objective is to support self-help efforts toward food self-sufficiency. In Niger, fertilizer was provided in FY2009. This fertilizer was offered at a low price to farmers in Niger, and will help to promote the cultivation of grain and vegetables. In the past, Japan has provided fertilizer, agricultural machinery and other materials for the sake of food security in Niger.

• Technical Cooperation Project: (Viet Nam) Enhancing Functions of Agricultural Cooperatives (March 2006 to March 2010)

The aim of this project is to build models of excellence for enhancing the functions of agricultural cooperatives, which will lead to better livelihoods for their members, through enhancing the business, strengthening the organization and building the capacity of officers of pilot agricultural cooperatives (PACs) and satellite agricultural cooperatives (SACs), and through building the capacity of administrative officers within the pilot provinces for developing the agricultural cooperatives.

- 2) Effective use of local resources
 - Technical Cooperation Project: (Dominican Republic) Project for Sustainable Agriculture Development for the Small Scaled Farmers in North-Central Region (October 2004 to October 2009)

The objective of this project is to increase the income of small-scale farmers in the target region, such as through the development and demonstration of technology related to the management of soil fertilizers that use manure, organic composted fertilizer, chicken droppings and so on for environmental agriculture, as well as the development and demonstration of technology related to controlling disease and insect damage, and the development and demonstration of technology related to agricultural production.

• Technical Cooperation Project: (Indonesia) Project for Dissemination of Appropriate Dairy Technology Utilizing Local Resources (July 2004 to June 2007)

The objective of this project was for the autonomous management of training programs, conducted using local resources, on technology used in dairy farming for feeding and rearing animals; and for the dissemination of technology for managing the rearing of animals in dairy farming. (1) Revisions were made to the training programs, conducted using local resources, for disseminating technology used in dairy farming for feeding and rearing animals; (2) the same technology was entrenched among trainees; and (3) training was conducted for farmer groups.

• Technical Cooperation Project: (Indonesia) Beef Cattle Development Project

Utilizing Local Resources in the Eastern Part of Indonesia (November 2006 to November 2011)

The aim of this project was to manufacture and sell high-quality compost in an effort to raise incomes through the production of beef cattle. As a result, excrement which had previously been discarded was used effectively as a new source of income, the production of compost was extended to surrounding farmers, the discharge of excrement into rivers was stopped, cuts were made to the cost for purchasing chemical fertilizers, group unity was strengthened, and motivation was improved.

• Technical Cooperation Project: (Nicaragua) Strengthening of the Integrated Pest Management in the Northwest Region in Nicaragua (August 2002 to July 2005)

With an objective of promoting the use of biological pesticides among small-scale and medium-scale farmers, (1) technology for producing biological pesticides suited to the technological capacity and needs of farmers was established at the National Autonomous University of Nicaragua (UNAN); (2) distribution routes for the biological pesticides produced at UNAN were established; and (3) understanding among farmers was promoted on the effects and usage of the biological pesticides produced at UNAN.

3) Strengthening the systems for materials distribution and inspection

Cooperation focused on public agencies engaged in registering and inspecting agricultural production equipment and materials and in providing regulation and guidance on their distribution and use is one of JICA's areas of expertise, and will continue to be an area of high demand. In recent years, there has been a growing need for technical support, such as for the establishment of standards for the proper use of agricultural production equipment and materials, and JICA has been providing cooperation centered on capacity development for technical guidance leaders by means of accepting trainees and dispatching experts from Japan.

• Loan Aid: (Indonesia) Rice Seed Production and Distribution Project (L/A signing date: February 15, 1985)

The objective of this project was to develop a rice seed production and distribution system in the three provinces on Sumatera Island, thereby contributing to a steady supply of high yield seeds, increasing the yield, and consequently increasing rice production in this area. During the project, seed processing centers (dryers, graders, etc.) were constructed in 11 locations.

• Loan Aid: (China) Luzhai Fertilizer Plant Construction Project (L/A signing date: November 2, 1995)

The objective of this project was to cope with the rapidly increasing demand for chemical fertilizers in the Guangxi Zhuang Autonomous Region, and by extension, the demand for food here, by constructing a plant producing diammonium phosphate (DAP) fertilizer. The project succeeded in constructing a DAP fertilizer plant (240,000 tons/year: on a product weight basis).

• Technical Cooperation Project: (Cambodia) Capacity Building for the Quality Standard Control of Agricultural Materials (Chemical Fertilizers and Pesticides) (QCAM Project) (March 2009 to March 2012)

With an aim of improving the capacity of laboratories in terms of analyzing chemical fertilizers and pesticides, formulating the first draft of regulations related to the standard requirements for registration and post-registration of chemical fertilizers and pesticides, and raising awareness on the proper usage and quality of chemical fertilizers and pesticides, this project promotes proper usage and quality control of chemical fertilizers and pesticides in pilot areas.

• Technical Cooperation Project: (Laos) Rice Seed Multiplication and Distribution System Improvement Project (August 2006 to July 2011)

With an aim of establishing a rice seed multiplication and distribution system, this project sets out to establish management systems for the multiplication and distribution of rice seeds at the Lao Ministry of Agriculture and Forestry (central level) and at the provincial level, to improve the quality of foundation seeds (R1) at the Rice and Cash Crop Research Center (Vientiane) and at the Luang Namtha Agriculture and Forestry Research Center, to build the leadership capacity of seed multiplication stations, to improve the multiplication and distribution of stock seeds (R2) and extension seeds (R3) at the Nongheo Seed Multiplication Center, the Pakcheng Agriculture Station and the Luang Namtha Agriculture and Forestry Research Center the multiplication and distribution of extension seeds at the farmer level.

(3) Issues in implementing projects

In most cases, the small farmers targeted for agricultural support are predominantly engaged in subsistence production, and so given that their opportunities for earning cash are limited, they do not have sufficient spare capacity to invest in appropriate agricultural materials. Another factor making it difficult for farmers to access agricultural materials is the fact that the planting season when farmers need the materials does not coincide with the harvest season when they are likely to have the necessary cash.

Furthermore, as for farmers with limited access to such agricultural production equipment and materials, despite the project also being for the effective use of local resources, the current situation is that there are few specific details on how to use them and they lack this knowledge.

1) Agricultural machinery and equipment

Generally speaking, access to agricultural machinery and equipment is limited. Furthermore, as things stand now, small farmers in poor areas cannot afford to purchase this equipment and materials from the market.

2) Stable supply of seeds

In addition to small farmers having only limited access to high-yielding varieties amid weakening agricultural extension programs, in many countries, there are no adequate seed inspection systems in place. As a result, seeds with degraded varietal characteristics are in circulation and the quality of seeds deteriorates as farmers too poor to pay for seeds repeatedly cultivate their own seeds in an inappropriate way, creating serious production problems.

3) Appropriate use and stable supply of agrochemicals/fertilizers

In countries where large quantities of agrochemicals are in circulation despite no established standards for their use, relying on chemical pesticides without understanding their proper usage not only means that their efficacy on pests will be stifled, but also that there will be concerns about the emergence of pests resistant to the chemical agent and about their adverse effects on human health and the environment. In some countries, agrochemicals are still in distribution despite being previously banned out of concern for their safety and residual effects.

Furthermore, the quality, quantity and availability of information on fertilizers are currently not enough to meet the demand of farmers, and so many farmers are either unable to secure fertilizer, or if they are, they are introducing fertilizers recommended by retailers without any basis of knowledge.

4) Plant genetic resources

Amid ongoing changes in the natural environment caused, in part, by global warming, and amid the progressive loss of biodiversity due to factors such as development, excessive hunting and the introduction of non-native species, there is a growing need for appropriate management in the use and application of valuable genetic resources.

(4) Points for concern in extending cooperation

With an aim of securing and using agricultural production equipment and materials that are appropriate for the target region and for the actual circumstances of farmers, select one or a combination of cooperation options, with a particular focus on those below.

1) Agricultural machinery and equipment

Improve the provision of agricultural equipment, materials and fertilizer using Grant Aid for Underprivileged Farmers and general grant aid, and improve access such as through the introduction of subsidy policies. Furthermore, for small farmers who lack sufficient funds to purchase materials, work to improve access to agricultural production equipment and materials by means of joint purchasing through agricultural financing and the activities of agricultural cooperatives.

2) Securing superior varieties of seeds

Approaches include creating the country's own system for preserving and utilizing

plant genetic resources, developing systems for improving seed-selection, inspection and propagation, promoting the distribution of improved seeds and supporting the improvement of technology enabling farmers to cultivate their own seeds.

3) Quality assurance and appropriate use of fertilizers and pesticides

With respect to intangible support for the proper assurance and use of agricultural production equipment and materials—such as the development of registration systems and distribution regulations by public agencies for ensuring quality at the import and distribution stage, the establishment of standards for ensuring proper use at the working level, and the strengthening of leadership systems—extend cooperation with a focus on the capacity development of technical guidance leaders such as by accepting trainees and dispatching experts from Japan.

When regulating the distribution and use of pesticides, the concepts and techniques of risk management recently adopted in developed countries need to be understood and accepted, including by aid officials.

4) Promoting "agriculture based on the use of local resources"

As for cooperation targeting small-scale farmers in poor areas, with an aim of achieving self-sufficient livelihoods by means of low-input, regional recycling-oriented agriculture, provide support drawing on Japan's knowledge of its own organic agriculture. For this purpose, as part of "integrated rural development," develop regional and community systems that enable recycling-oriented agriculture, introduce mixed agriculture combined with livestock raising, develop alternative technologies to replace chemical pesticides such as through the use of resistant varieties and natural enemies or the use of naturally derived controls, and introduce compost made from donated organic matter.

When utilizing naturally derived controls, if it appears their constituent elements have not been specified, cooperation should not be provided on account of the possibility that they could have an unfavorable effect on humans and/or the environment. In addition, in order for farmers to systematically learn about community implementation systems and the current conditions in "agriculture based on the use of local resources" and about various production technologies at the small-scale farmer level, make good use of "Training and Dialogue Programs" whereby farmers can systematically learn based on real examples in Japan.

"Agriculture based on the use of local resources" is regarded as being complementary to "modern agriculture," and so consideration needs to be given to a combination of appropriate technologies once the natural and social conditions of the region have been evaluated.

5) Plant genetic resources

Technical cooperation including science and technology cooperation and "Training and Dialogue Programs" need to continue to be implemented so as to enable the sustainable use of plant genetic resources through appropriate conservation and proper collection, management and distribution.

resources				
Determinants	Modern agriculture	Agriculture based on the use of local resources		
Time required to produce effects	Generally short	Generally long (at least several years)		
Required capital	High (irrigation, improvement of agricultural land, seeds, fertilizer, pesticides)	Low		
Sustainability	Sustainability declines if resources managed inappropriately.	Highly sustainable		
Environmental impact	Adverse effects to surrounding environment if resources managed inappropriately	Agriculture that is in harmony with the local environment		
Labor input	Low	High (production and distribution of compost, pest control, weeding, etc.)		
Yield	High (dependent on amount of input materials)	Takes a certain period of time before a stable yield can be obtained		
Stability of yield	Generally stable, but there are concerns about damage from repeated cultivation, soil degradation and other problems.	Fluctuations may be large depending on the effects of pests, etc. (reduce risk such as by shifting to mixed agriculture).		
Profitability	Increased yield will lead to increases in profitability.	While yields are unstable, profitability will also be unstable; but if consumer needs can be satiated well, farmers can expect improved profitability.		
Introduced technology	Fundamental technologies should be uniform in each country; need to establish technology systems attuned to local conditions.	Although there is no systemization of technology, there is an approach of solving problems within the region.		

Table 2-4 Comparison of modern agriculture and agriculture based on the use of local resources

Mid-Term Objective 1-3, Reference: Agricultural production equipment and materials

Agricultural production equipment and materials make increasing, stabilizing and rationalizing agricultural production possible. They bring about various positive effects, such as allowing farmers to engage in agricultural work at appropriate times and to reduce their labor. In making use of them, however, it is necessary to closely examine their effectiveness and drawbacks. In securing agricultural production equipment and materials, it is necessary, while utilizing the resources distribution functions of market mechanisms, to build such supplementary supply systems as community- and cooperative-managed purchasing programs for small farmers who lack market access.

In countries where poor-quality or defective agricultural production equipment and materials are in circulation, and either large volumes of them are imported which do not satisfy the country's agricultural conditions (farmland, climate, cultivation systems, etc.) or there are no established standards for their use, those countries' government are obliged to create inspection systems, improve existing certification systems and set up safety standards for this equipment and materials, while also building information services for the benefit of farmers.

(1) Agricultural machinery and equipment

Promoting the introduction and mechanization²⁵ of agricultural machinery and

²⁵ In these Guidelines, the term "mechanization" shall include improvement of agricultural machinery, including the

equipment enables farmers to work with a speed and intensity not possible with manual labor and also helps to improve land use.²⁶

In countries that have introduced and are using foreign-made agricultural machinery and equipment, although the ultimate goal is for those countries to produce their own agricultural machinery and equipment that meets their agricultural production needs, it is important to take a step-by-step approach after first assessing the present conditions of each country's agricultural production, administration, testing and research systems as well as machinery manufacturers and the industrial structure. It is also important to develop a series of industries for repairing agricultural equipment when it breaks down, to improve the distribution systems for spare parts and the inspection systems for the safe use of machinery, to train skillful operators, and to develop a variety of financing channels for purchasing agricultural equipment and materials.

(2) Stable supply of seeds

The introduction of high-yielding varieties has achieved the most prominent success in the history of improving agricultural productivity.²⁷ From this perspective, building a stable supply system for seeds which meet the respective local production conditions and which maximize cost-effectiveness is the most important element in agricultural production.²⁸

In order to propagate and disseminate superior varieties in countries where small-scale farmers have only limited access to high-yielding varieties amid weakening agricultural extension programs,²⁹ ordinarily, extension from research institutes to farmers needs to go through four steps: (1) breeder seed, (2) foundation seed, (3) stock seed, and (4) certified seed. Of these, it is especially important that the government of the partner country take responsibility for developing systems for the propagation of stock seed and distribution to seed producing farms (step 3) and systems for the production of certified seed inspection systems are in place, seeds with degraded varietal characteristics are in circulation and the quality of seeds deteriorates as farmers too poor to pay for seeds repeatedly cultivate their own seeds, creating serious production problems.³⁰

use of agricultural machinery powered by animal labor.

²⁶ People tend to think that the introduction of agricultural machinery will take jobs away from farmers. On the one hand, it will replace labor in rural areas, but on the other, it will also serve to expand production and increase related demand, leading to the formation of a more sophisticated industrial structure.

²⁷ CGIAR and other international agricultural research organizations are stepping up efforts for the breeding and development of seeds. The development of high-yielding varieties by the International Rice Research Institute (IRRI) in the 1970s, called the "Green Revolution," made dramatic increases in yields possible. The development of the New Rice for Africa (NERICA) through cross-breeding by the West Africa Rice Development Association (WARDA, currently the Africa Rice Center) in the second half of the 1990s is said to be one of the varieties suited to African countries dependent on rainwater and never straying far from the verge of starvation.

²⁸ Since high-yielding varieties do not produce expected harvests unless agricultural production resources and materials like water, fertilizers and agrochemicals are properly combined, it is necessary to consider the possibility of using other materials that are technically and economically more feasible in introducing them.

²⁹ Since the 1980s, many developing countries have been carrying out structural adjustment programs, therefore agriculture-related budgets and personnel have been reduced because of fiscal spending cuts, privatization projects and shifts to a market economy. The result has been a serious setback in agricultural research and improvement promotion projects that are public in nature.

³⁰ Generally speaking, seeds with certain varietal characteristics will deteriorate if farmers repeatedly cultivate their

To cope with these problems, it is necessary to take an approach that includes the creation of the country's own system for preserving and utilizing plant genetic resources as well as systems for improving seed-selection, inspection and propagation. The approach could also embrace promoting the distribution of improved seeds and supporting the improvement of technology enabling farmers to cultivate their own seeds.

(3) Appropriate use of agrochemicals

Agrochemicals are an important production material for the improvement of agricultural production. When used appropriately, they will protect agricultural products from damage caused by harmful diseases, insects and weeds, and they will also save farmers effort. Necessary approaches include establishing standards for agrochemical residues on food as well as those for the use of such chemicals, improving dissemination and guidance systems promoting the appropriate use of agrochemicals, developing alternative technologies to replace chemical pesticides such as through the use of resistant varieties and natural enemies or the use of naturally derived controls, and making improvements in monitoring and information disclosure systems. When utilizing naturally derived controls, if it appears their constituent elements have not been specified, cooperation should not be provided on account of the possibility that they could have an unfavorable effect on humans and/or the environment.

(4) Stable supply and appropriate use of fertilizers

Fertilizers are an important element in raising agricultural productivity. They improve the chemical, physical and biological qualities of soil, which is the foundation for growing plants.

Selecting fertilizers that are suited to specific local agricultural conditions is an important element for enhancing agricultural productivity. Not only is it important to cooperate in improving soil-testing technology for understanding the specific characteristics of local agricultural productivity and building capacity for evaluating and testing fertilizers, it is also important to cooperate in the development of fertilizing standards and selection of fertilizers based on these. In addition, evaluating the quality of fertilizers on the market, controlling fertilizer registrations and so on are also vital. Many farmers often use fertilizers recommended by retailers without any basis of knowledge, and so it is also necessary to provide them with adequate information about the selection and application of appropriate fertilizers based on soil tests. Furthermore, for those small-scale farmers without access to the market, introduction and promotion of barnyard manure can be considered.

own seeds using inappropriate technology, and obtaining the expected varietal characteristics will become more and more difficult.

Mid-Term Objective 1-4: Capacity building for research and development

- (1) Summary of concept
 - 1) Scope of mid-term objective

Strengthen capacity for research and development for the purpose of increasing agricultural productivity and quality in developing countries. Include basic research at the central level, and research and application at the local level.

2) Specific details of cooperation activities

With a view to enriching and enhancing university and government testing and research organizations, provide indirect support for the development of human resources, for the establishment and improvement of facilities, and for the provision of advice and securing of budgets for implementation systems.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-3 "Securing agricultural production equipment/materials, improving their use," 1-9 "Promoting agricultural extension" and 1-11 "Response to global environmental issues"

(2) Current state of JICA projects

<Past developments>

Up until the 1990s, the common form of technical cooperation practiced in this area was so-called "center-based" technical cooperation, delivered through grant aid and loan aid for the establishment of research institutes at the central level, followed by ongoing technical cooperation. After this, with a view to extending research results widely at the working level, there was a focal shift to activities targeted at "regional-hub-based" testing institutions and extension organizations.

In addition, in partnership with the Japan Science and Technology Agency (JST), JICA has strived to acquire new knowledge leading to the resolution of global issues and advances in scientific and technological standards, by promoting international joint research with developing countries on "global issues."

It has also promoted research and development based on cooperation with international organizations such as the Consultative Group on International Agricultural Research (CGIAR) and the Coalition for African Rice Development (CARD).

- 1) Center-based
 - Technical Cooperation Project: (Myanmar) Seed Bank Project in the Union of Myanmar (June 1997 to May 2002)

For the purpose of establishing a system in the seed bank for exploration and collection, classification and evaluation, preservation and multiplication, data

management, and exchange of genetic resources and information, this project promoted: (1) acquisition of knowledge and technologies for exploration and collection; (2) acquisition of knowledge and technologies for classification and evaluation; (3) acquisition of knowledge and technologies for preservation and multiplication; (4) improvement of the management and utilization of data; and (5) improvement of the exchange of genetic resources and information.

• Loan Aid: (Indonesia) The Bogor Agricultural University (IPB) Development Project (II) (L/A signing date: November 29, 1994)

For the purpose of meeting the needs for human resources development and research activities in the field of agriculture, which are becoming increasingly diverse and sophisticated, the objective of this project was to build on the development of the Faculty of Fisheries and Marine Science and the Faculty of Animal Husbandry, which was undertaken in the first phase of this project, and develop and expand the Faculty of Agriculture and Faculty of Veterinary Medicine. The project assisted the funding for: (1) construction of buildings for the Faculties of Agriculture and Veterinary Medicine (classrooms, teaching hospital, laboratories, etc.); (2) procurement of furniture and teaching equipment and materials; (3) overseas studies; (4) consulting services; and (5) technical assistance (TA).

- 2) Regional-hub-based
 - Technical Cooperation Project: (Philippines) Bohol Integrated Agriculture Promotion Project (BIAPP) (November 1996 to November 2001)

With activities based at the Bohol Agricultural Promotion Center (BAPC) and at the model district, the purpose of this project was to improve agricultural productivity by improving the agricultural technology and water management technology used by farmers in Bohol province. The project promoted: (1) baseline surveys and monitoring; (2) establishment of farming systems adapted to local conditions where rice is the staple crop; (3) effective management of irrigation associations; (4) enhancement of the technical capabilities of extension workers and key farmers in Bohol; and (5) building of collaborative linkages for agricultural promotion between the BAPC and local governments.

• Technical Cooperation Project: (Paraguay) The Research Project on Soybean Production in Paraguay (October 1997 to September 2002)

With a view to developing appropriate varieties and sustainable cultivation techniques, the purpose of this project was to enhance the research capability of the Regional Agriculture Investigation Center (CRIA) in relation to breeding, cultivation and soil management in soybean production. The project promoted: (1) improving techniques for breeding soybeans; (2) improving cultivation techniques with a view to establishment of an appropriate cropping system; and (3) improving soil management techniques.

- 3) Science and Technology Research Partnership for Sustainable Development (SATREPS)
 - Technical Cooperation Project: (Brazil) Development of Genetic Engineering Technology of Crops with Stress Tolerance against Degradation of Global Environment (March 2010 to March 2015)

For the purpose of developing technology for engineering soybeans with tolerance to environmental stress, this project involves: (1) identification of useful genes involved in developing tolerance to environmental stress; (2) isolation of stress-responsive promoters and optimization of their combination with useful genes; (3) development of soybean lines into which combination of promoters and useful genes is introduced; and (4) selection of recombinant soybean lines that demonstrate environmental stress tolerance.

- 4) Cooperation with international organizations (CARD)
 - Technical Cooperation Project: (Uganda) NERICA Rice Promotion Project in Uganda (August 2008 to June 2011)

With an aim of improving the production volume and productivity of NERICA (New Rice for Africa) rice, this project involves: (1) strengthening and developing the research functions (both organization level and personnel level) relating to NERICA rice (including lowland) at the National Crops Resources Research Institute (NaCRRI) and Zonal Agricultural Research and Development Institutes (ZARDI); and (2) disseminating appropriate rice production techniques to target farmers, etc.

<CGIAR-ICARDA>

• Third-country Training: (Syria, Iraq) Enhancing Human Resources Development (Phase I: April 2005 to March 2010, Phase II: April 2010 to March 2013)

With an objective of supporting sustainable national agricultural production and development, the purpose of this project is to improve human resource capacity in agricultural research in the three areas of water-use management, biotechnology and livestock husbandry. The counterpart organization in this project is the International Center for Agricultural Research in the Dry Areas (ICARDA).

(3) Issues in implementing projects

In many developing countries, there are many instances where the linkage between research institutes at the central level and regional organizations is weak, and where not enough research and application is undertaken to make the outputs of basic research usable at the local level by adapting them to suit the natural conditions of each region.

Green Revolution technologies to date have been effectively developed and disseminated, but in regions where the conditions are not right for adopting these technologies, intra-regional and inter-regional disparities have widened. In such regions, "agriculture based on the use of local resources" has not functioned well as a technology

for farming sustainably in fragile environmental conditions, which can also be introduced for the poor (accessible and easy methods and yet which are not a financial burden) and which has little burden on the environment.

Therefore, human resources needs to be developed, capable of developing technologies best suited to local conditions, including making improvements to conventional technologies, not just introducing new technologies. Moreover, any of these technologies that exist in Japan need to be systemized, and the most efficient farmer technology needs to be made universal.

(4) Points for concern in extending cooperation

Research cooperation will need to be extended in order to address these issues, with a focus on responding to global issues. With respect to improving agricultural productivity, at present, there is little in the way of information on technology based on the "use of local resources." Therefore, any of this technology that exists in Japan should be systematically organized so that a good balance of "Green Revolution" technologies and those based on the "use of local resources" can be applied once the natural and social conditions of the local region have been evaluated.

Particularly in recent years, JICA has taken action such as for the improvement of agricultural productivity, including the doubling of rice production, as a measure to support Africa which was highlighted by Japan at the Fourth Tokyo International Conference on African Development (TICAD IV: May 2008). It has provided support in Africa for research on rice production technology, and has developed key human resources from Africa through training in Japan.

In this particular area, the World Bank Group has listed two new forms of technical support: (1) capacity development for analyzing the potential risks and benefits of transgenics; and (2) effective and transparent institution-building related to the adoption and use of transgenics.³¹ With respect to the development and use of transgenics, while there are certain promising aspects for food security, such as using them effectively to achieve productivity improvements in severe environmental conditions such as drought and damage caused by blight and insects, and better nutrient supply through improved quality, at the same time, there are also concerns about gene recombination technology leading to the artificial creation of combinatorial genes not obtainable in the natural world. Therefore, when providing support, careful consideration needs to be given to the readiness of the target country to receive transgenics.

At JICA, the Science and Technology Research Partnership for Sustainable Development (SATREPS) was commenced in FY2009, in an effort for universities and research institutes in Japan and developing countries to cooperate in conducting international joint research on global challenges in the areas of the environment, energy, disaster prevention and infectious diseases. As part of this, as well as providing the abovementioned science and technology cooperation for gene recombination technology in Brazil, JICA has also extended cooperation related to the conservation of plant genetic resources.

³¹ World Bank Group Agriculture Action Plan FY2010-2012

Furthermore, since 2009, JICA has used public seminars as a forum for exchanging views with NGOs and research institutes in Japan on "the potential for agriculture based on the use of local resources."

Mid-Term Objective 1-4, Reference: Strengthening agriculture-related higher education

Higher education is defined as "education, training and research guidance provided by government-certified colleges and universities and other educational institutions following the completion of secondary education."³² In addition to education at regular senior high schools and universities, it also includes short-term technical education and vocational training. Among the functions of higher agricultural education institutions are "education," "research" and "promulgation." Higher agricultural education institutions in developing countries can improve a whole nation's technical levels in the field of agriculture, and in turn, effect sustainable agricultural production, by strengthening technical education and vocational training playing a role in farmer education and in the extension of agricultural programs to farmers.

Higher agricultural education in developing countries is often faced with many problems, including insufficient facilities and teaching materials, and the need to improve teacher quality, curriculums, teaching methods and materials. In the past, the prevailing conditions and needs of farmers were not necessarily understood, and sufficient coordination with administrative, testing and research organizations was not adequately maintained. In some respects, this has meant that higher agricultural education has not contributed enough to improving productivity, with the outputs of higher education, research activities and promulgation not sufficiently seeping down to every level of agriculture, or farmers not accepting the proposed technology.

In order for higher agricultural education institutions to function properly and for the results they produce to spur agricultural development, for the most part, it is necessary to "improve their educational activities," to "strengthen their research functions," to "upgrade their management," to "strengthen coordination with related organizations" and to "strengthen their functions as a base for promoting the spread of agriculture."

(1) Improving educational activities

In order to improve educational activities, it is important to respond to the specific social needs that developing countries face, like finding solutions to inherent agricultural problems, grasping the conditions of farmers and rural areas and grappling with environmental problems. It is also important to improve the quality of education through improving inputs such as instructors and curriculums. Moreover, in order to ensure the international currency of educational activities, it is likely that it will be necessary to develop standard certification systems under which official organizations evaluate the education.³³ It is also important to improve scholarships and other schemes designed to keep socially disadvantaged but bright students in rural areas close to higher agricultural education.

³² Institute for International Cooperation (IFIC) (2003a)

³³ In order to guarantee and improve the quality of the many forms of higher education in developing countries, and to ensure the international currency of education, in addition to making improvements to educational inputs such as instructors, students and educational facilities, an accreditation system for higher educational institutions is becoming essential, under which official organizations evaluate educational activities. (Institute for International Cooperation (IFIC) (2003a) p.21)

(2) Strengthening research functions

In order to strengthen the research functions of educational institutions, first and foremost, it is important to develop and enhance human resources, such as instructors and researchers, while at the same time ameliorating the environment for research activities. Aid can also be provided for improving the research activities of agricultural universities and departments. In addition, it is important to emphasize the necessity of agricultural research activities in agricultural development and to foster the environment in which active research is possible.

(3) Improving management

In order to improve and maintain the overall quality of the educational activities and research functions of higher education and to make sure that the higher educational system functions smoothly, it is necessary to improve the management of all higher education institutions. First, it is necessary to establish and implement higher agricultural education policies that are closely linked to the state's social and economic conditions, after taking international agreements and goals as well as national development plans and trends in other sectors into consideration. It is also necessary to improve the administration and management of each higher educational institution and to make effective use of its facilities and equipment. Generally speaking, higher education in a developing country is often heavily influenced by the political intentions and fiscal conditions of its government. Therefore, it is extremely important to secure the academic freedom of higher educational institutions, utilize limited budgetary allocations efficiently and to diversify financial sources, in order to conduct the kind of research that is conducive to agricultural development without political influences over contents and systems.

(4) Strengthening coordination with related organizations, local areas and regions

In order to link the results of basic research at higher agricultural education institutions with those of practical research on increased food production and responses to environmental issues, it is important to promote coordination between higher agricultural education institutions and national agricultural research organizations and the private sector.

Higher educational institutions in developing countries can ensure effective transfer of agricultural technology and knowledge as well as efficient human resources development by teaming up with agricultural universities and departments in developed countries and international research organizations such as those under the Consultative Group for International Agricultural Research (CGIAR).³⁴ It is also important to establish networks among universities in developing countries that are facing similar problems and to promote exchanges on an ongoing basis.

To extend the results of research to national agricultural development, it is also desirable for central institutions of higher agricultural education to deepen coordination with local

³⁴ The Consultative Group for International Agricultural Research (CGIAR) is headquartered in the World Bank. It embraces 16 research organizations, including the International Rice Research Institute (IRRI), the International Maize and Wheat Improvement Center (CIMMYT) and the West Africa Rice Development Association (WARDA).

agricultural high schools, with a view to serving as a leader for subordinate higher educational institutions in local areas.

Since graduates of agricultural universities in developing countries sometimes cannot find appropriate jobs and therefore cannot use the technology and knowledge they have acquired, it is important to take decisive steps to explore job opportunities for those students and to improve environments for accommodating graduates of national agricultural research organizations and other institutions.

(5) Strengthening functions as a base for promoting the spread of agriculture

As governments curb their role for promoting the spread of agriculture, higher agricultural educational institutions will be increasingly required to function as the base for supplementing and strengthening that role and to undertake the duty of spreading education and improved agricultural technology to farmers.

JICA is engaged in the improvement of education activities in addition to the strengthening of research functions. To date, it has provided aid mainly for upgrading educational activities at agricultural universities, graduate schools and agricultural departments and for strengthening their research functions. The cooperation involved the dispatch of experts to provide guidance and advice, the acceptance of counterparts and the provision of equipment and materials, mostly in combination with grant aid for facilities and equipment.³⁵ Aid to agricultural departments and universities includes two types of cooperation. One is aimed at helping new agricultural departments or universities as a whole to establish their educational systems and strengthen their educational/research functions in combination with grant aid provided for the construction of school buildings and other facilities, as in the cases of the Institute of Postgraduate Studies in Agriculture in Bangladesh and the School of Veterinary Medicine at the University of Zambia. The other type of cooperation is targeted at specific areas of study at existing universities or graduate schools, such as the expansion of the Department of Biotechnology at Putra University in Malaysia.

Among the projects designed to help universities enhance their dissemination function, there is one involving Kasetsart University in Thailand. In this instance, JICA has been sending experts to the National Educational Training Center (NETC), established at the university with Japan's grant aid, and providing guidance, advice, technology transfers and equipment since 1981. It has also accepted trainees in Japan. Thus, it has helped the NETC to strengthen its role as a base for spreading agricultural technology and research results not only to students but also to farmers.

In a project to support the strengthening of coordination between higher educational institutions and related organizations and regions, the Development Studies Institute (DSI) was established at the Sokoine University of Agriculture in Tanzania to explore the ways of reducing poverty in the region through pilot projects.

There are not many projects JICA has undertaken to aid the management of higher education, but it is essential to improve administrative and management systems for conducting educational and research activities efficiently and to strengthen management

³⁵ It is called "project-type technical cooperation" until FY2002.

capabilities of people involved in education and thus maintain sustained effects of various projects. In a program to improve the Hanoi Agricultural University, which was completed in 2003, JICA provided support for the management of the university, in addition to traditional aid for the strengthening of educational and research functions. Going forward, it will be important to actively carry out projects that are focused on management improvement, and accumulate knowledge and expertise in this field.
Mid-Term Objective 1-5: Promoting crop production (rice and other grain crops)

- (1) Summary of concept
 - 1) Scope of mid-term objective

In order to contribute to improving the nutrition and livelihood of farmers, aim to produce crops in a way that takes full advantage of the production potential of the local region.

2) Specific details of cooperation activities

Varieties and seeds

Varieties can be broadly separated into traditional varieties and modern varieties. In general, modern varieties produce high yields, but they tend to require certain environmental improvements (irrigation, fertilizers) in order to be effective. Traditional varieties tend to have low yields, but at the same time, they sometimes have better flavor or are superior in their ability to adapt to the environmental conditions specific to the local area. Yield is also greatly influenced by the quality of seeds. Most small-scale farmers obtain seeds by cultivating them themselves, but they could expect a greater yield if they adopted varieties of seeds that have been properly produced in managed fields. Optimization of seeding density is also a factor in increasing yield, and particularly under rainfed conditions, consideration also needs to be given to the balance between seeding density and weed management.

Water supply and water management

Although water supply and water management have the greatest effect on increasing yield, at the same time, their introduction and maintenance come at a considerable cost. First, confirm the conditions of local water resources before including consideration of the participatory development of terminal waterways and participatory water management while also taking account of cost effectiveness.

As for grains other than rice, in most regions, rainfed cultivation is the usual practice. Under such conditions, it is important to devise ways of making the best use of a limited amount of rain that falls only at certain times of the year. Specific measures for examination include: the introduction of early ripening varieties to avoid the dry season, no-tillage cultivation to prevent transpiration from the topsoil, weeding designed to reduce transpiration from weeds, and the introduction of split fertilizer application for controlling any excessive luxuriation (which leads to wasteful transpiration) while ensuring necessary growth. Even in regions where irrigation is possible, consideration also needs to be given to techniques for increasing water utilization efficiency, such as using irrigation only to supplement the water supply.

Fertility management

Variety, water and fertilizer are the three essential elements for improving yield effectively, but more often than not, subsistence farmers cannot afford to purchase fertilizer. Even farmers who produce for market have difficulty accessing materials because the planting season when they need to purchase materials does not coincide with the harvest season when they are likely to have more cash. Initiatives to improve access to materials have been advanced, such as through the use of 2KR, joint purchasing via farmers' organizations, provision of fertilizer revolving funds, advances of microcredit, and the introduction of organic fertilizers that utilize local resources. It is also important to consider timing and the amount of fertilizer applied so as to utilize the limited amounts effectively.

Post-harvest processing

In countries where much of the harvest is being lost due to delays in post-harvest processing (threshing, drying, storage), this is resulting in a decline in the amount and quality of grain supplied for family consumption. The quality of grain sold at market is also falling, as are retail prices due to grain hitting the market at roughly the same time. An integrated approach needs to be taken for improving the infrastructure and machinery for post-harvest processing and for strengthening the farmers' organizations enabling self-sustained maintenance.

3) Connection with other mid-term objectives

Mid-Term Objective 1-3 "Securing agricultural production equipment/materials, improving their use"

(2) Current state of JICA projects

When it comes to technical cooperation in the field of agriculture, Japan's greatest predominance is in the growing of rice. In the past, Japan has provided a wide range of cooperation, especially in Asia, from research and development, to the development of production infrastructure and post-harvest processing. Productivity has improved in many Asian countries recently, and so a policy issue now is improving distribution and product diversification (introduction of commercial crops). Meanwhile, in African countries, as part of the CARD initiatives which have been advanced in response to the increase in demand for rice as a commercial crop, various efforts are being taken to transfer the Asian experience in Africa.

On the other hand, as for grains other than rice, such as wheat, corn and sorghum, although these are incorporated as items for cultivation in project areas, there are few cases where productivity improvement for these grains is tackled as a central issue.

• Technical Cooperation Project: (Cuba) Reinforcement of Certificated Seed Production System in Popular Rice (March 2008 to November 2010)

With an aim of the purposeful distribution of registered seeds, this project involved: (1) the planned production and distribution of registered seeds of appealing varieties of rice; (2) increased production and improved access to registered seeds; and (3) better knowledge on varieties.

• Technical Cooperation Project: (Uganda) NERICA Rice Promotion Project in

Uganda (August 2008 to June 2011)

With an aim of improving the production volume and productivity of NERICA (New Rice for Africa) rice in the project area, this project involves: (1) strengthening and developing the research functions (both organization level and personnel level) relating to NERICA rice (including lowland) at the National Crops Resources Research Institute (NaCRRI) and Zonal Agricultural Research and Development Institutes (ZARDI); and (2) disseminating appropriate rice production techniques to farmers, etc. in the target area.

(3) Issues in implementing projects

When providing actual support, it would not be practical to carry out all of the initiatives listed under "Summary of concept" at once. The support inputs need to be narrowed down.

In countries where there is a prospect for self-sufficiency, especially in Southeast Asia, an issue is how to proceed with subsequent initiatives (product diversification, enhancement of sales strategies, etc.). Support that addresses this issue is needed.

No matter the country or region, there are some regions where introducing modern farming techniques is difficult because of fragile production conditions (access to water, steep terrain, etc.) and/or poor market access.

(4) Points for concern in extending cooperation

The stage of development in a local region's grain production and distribution first needs to be ascertained before gradually considering support tailored to each stage. Specifically, at the stage where farmers are aspiring for self-sufficiency, support should be given to activities focused on "varieties and seeds" and "water"; then, once farmers anticipate a certain increase in yield, support should shift to the appropriate use of "fertilizers and pesticides"; and at the stage where farmers have achieved stable sales, support should be widened to include distribution and selling, such as "post-harvest processing" and the "creation of farmer organizations".

With respect to "agriculture based on the use of local resources" which anticipates sustained improvements in productivity while utilizing local resources effectively, consolidate and systemize the various efforts conducted in the past, and utilize them effectively for support targeting disadvantaged areas.

Mid-Term Objective 1-6: Promoting crop production (vegetables)

- (1) Summary of concept
 - 1) Scope of mid-term objective

In order to contribute to improving the nutrition and livelihood of farmers, aim to produce crops in a way that takes full advantage of the production potential of the local region.

2) Specific details of cooperation activities

Varieties and seeds

For the purpose ensuring the marketability of vegetables by improving productivity and quality, it is vital that varieties be selected that are suited to local conditions. Unlike staple grains such as rice and wheat, the seeds and seedlings of horticultural crops are predominantly produced and distributed primarily be the private sector.

In order to improve access to seeds amid such conditions, there needs to be effective cooperation with the private sector and access to finance needs to be improved. As an example of a specific activity, support is provided such as through agricultural financing and the activities of agricultural cooperatives so that inexpensive, good-quality seeds reach farmers at the appropriate time. Furthermore, in regions where the diet is mostly grains and meat and little progress has been made in introducing vegetables, projects have been used widely to tackle trial introductions of diverse varieties and the production of cultivation guidelines.

Water supply and water management

Generally speaking, horticultural crops are labor intensive and are highly profitably on a per unit area basis. For this reason, introducing them can be effective from a viewpoint of utilizing limited water resources. Specifically, in regions where dry-season crops can be grown through the introduction of irrigation facilities, support is provided either for the introduction of cultivation systems combining grains and vegetables which will lead to increased food production and livelihood improvement, or for the introduction of greenhouse horticulture which will assist intensive agriculture and improve productivity and profitability with limited water resources.

Fertility management

Same as for Mid-Term Objective 1-5 "Rice and other grain crops."

Post-harvest processing

In countries where delays in post-harvest processing (vegetable sorting, precooling, packaging and transportation) are causing falls in prices due to a decline in the quality of agricultural products and/or losses due to spoilage, projects deal with the establishment of uniform quality standards and the improvement of markets and

facilities for post-harvest processing.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-3 "Securing agricultural production equipment/materials, improving their use," and 1-5 "Rice and other grain crops"

- (2) Current state of JICA projects
 - Technical Cooperation Project: (Paraguay) The Improvement of Vegetable Production Techniques for Small Scale Farmers (April 1997 to March 2002)

For the purpose of improving vegetable production techniques for small-scale vegetable producers at the Ministry of Agriculture and Livestock's Instituto Agronómico Nacional (National Institute of Agronomy, IAN) and for getting the main small-scale farmers in the target area to use them, this project involved: (1) the selection and development of superior varieties; (2) the improvement of appropriate cultivation techniques; (3) clarification of the ecology of primary diseases and insect pests, and development of techniques for controlling them; and (4) transfer of the developed techniques and knowledge to extension workers at the Ministry of Agriculture and Livestock's Direccion de Extension Agraria (Direction of Agrarian Extension, DEAG) and to the main small-scale farmers.

• Technical Cooperation Project: (El Salvador) Supporting the Small-Scale Farmers in the Eastern Region (March 2008 to March 2012)

For the purpose of strengthening the system supporting vegetable cultivation services for small-scale farmers in the Eastern region of El Salvador, this project involved: (1) establishing a system for disseminating techniques for vegetable cultivation which can be used by small-scale farmers in the Eastern region; and (2) providing guidance on management improvement to small-scale farmers and vegetable producer associations in the Eastern region.

(3) Issues in implementing projects

Ensuring marketability is the most important factor for horticultural crops produced primarily for the purpose of sale. Many countries, though, are faced with such problems as: 1) reduced quality due to inappropriate post-harvest processing; 2) sluggish prices due to concentration of crops at harvesttime; 3) market being unresponsive to quality; 4) poor market access; and 5) low demand for vegetables in the first place.

- (4) Points for concern in extending cooperation
 - 1) Reduced quality due to inappropriate post-harvest processing

Sorting vegetables properly and improving packaging and means of transportation are highly effective for improving the quality of vegetables, lengthening the selling period and extending the distance that vegetables can be transported. On the other hand, in introducing these practices, there are various factors to be considered, including: (1) (infrastructure development) much infrastructure needs to be developed, such as facilities for sorting, packaging and storing vegetables, as well as distribution infrastructure and markets for trading produce; (2) ("soft" responses) in order to convey the improvements in quality to the market, initiatives are also needed for such "soft" aspects as the creation of organizations for making lots of the same quality and the introduction of highly transparent trading markets, including the establishment of uniform quality standards and the development of price information systems; (3) (market maturity) cost-effectiveness can only be achieved if the market is responsive to high quality. Consequently, once an overall evaluation of these factors has been made, initiatives need to be taken which are suited to local conditions.

Particularly given that each of these individual factors are interconnected, it needs to be noted that providing support for only a certain cross section of these factors may not result in any overall positive effect.

2) Sluggish prices due to concentration of crops at harvesttime

In regions where a certain degree of progress has been made in crop diversification, the seasonality of crops can have a considerable impact on price. In order to avoid this situation and raise profitability, various measures can be considered, including: (1) introducing vegetables which are not grown in other regions and which have little competition; (2) softening the harvesttime peak through an appropriate combination of early ripening and late ripening varieties; (3) adjusting when vegetables are shipped to market by introducing protected cultivation and early planting utilizing mulch and heated cultivation; (4) introducing superior items making use of the special natural conditions of the local area (growing vegetables and adjusting when crops are shipped by utilizing the local cool climate, etc.), and (5) controlling the volume and timing of shipments by creating grower organizations in the growing district and growing vegetables in a planned manner.

In determining whether any of these measures are reasonable, it will be important to evaluate the natural conditions of the local area, as well as market access, demand structure and the technological level of farmers.

3) Market being unresponsive to quality; low demand for vegetables

In many respects, this issue is dependent upon the consumption structure of the relevant country. It will be necessary therefore to first use market research and statistical data to confirm whether there have been any recent changes in demand, as well as whether there are any seasonal price variations, price differences in identical items and quality specifications and standards.

It needs to be recognized that changing the demand structure of consumers in a country or region through a project is basically impossible. A viable course of action would be to consider narrowing the target to the wealthy living in urban areas, resident employees from Japan and other foreign countries, groups of quality-conscious consumers and travelers touring or visiting rural areas, and then sell directly to hotels, restaurants and schools, or make profitable sales of good quality products such as through roadside rest stations along highways.

In promoting such initiatives, two extremely important activities are creating farmers' organizations for the purpose of ensuring uniform lots of produce, and establishing uniform quality standards in growing districts.

4) Poor market access

Market access is heavily predetermined by conditions inherent to a local area. To begin with, it is not easy to make significant improvements in rural areas in remote locations or mountainous areas. Although improving access to trunk roads is important, careful consideration needs to be given to the cost-effectiveness of such improvements. The improvements in post-harvest processing and transportation technologies listed in 1) above could lead to increased preservability and farther shipping distances, and so are also important for improving market access, but again, consideration needs to be given to their cost-effectiveness. For regions where improving market access proves difficult, a possible course of action could instead be to aim for a niche market with less competition by marketing unique products that make good use of the natural conditions or tourism resources inherent to the local area (One Village One Product, etc.).

Mid-Term Objective 1-7: Promoting the livestock sector

- (1) Summary of concept
 - 1) Scope of mid-term objective

It is rare for rural farms in developing countries for livestock farming to fulfill only one function. They usually create complex functions and benefits. The significance of livestock farming in developing countries is varied, including: (1) a means of improving farmer livelihoods through the sale of produce; (2) a source of high quality protein; (3) a role of emergency livestock reserves and insurance based on their asset value; (4) a source of raw materials such as leather and hair; (5) a source of manure to be used as fertilizer and fuel; (6) use as draft animals; and (7) a means of transport and transportation for daily life. Here, however, "promoting the livestock sector" in projects refers mainly to enhancing function (1).

2) Specific details of cooperation activities

In terms of technologies used in the area of livestock farming, in addition to breeding (artificial insemination), rearing management, feed production and livestock management, a traditional approach has been to maintain balance ecologically by combining livestock farming together with such areas as crop farming, marine products and forestry, and then making use of their respective advantages. It would appear that the importance of this will continue to increase in future projects.

In a broad sense, "animal health" is a branch of livestock farming. However, it is often treated as a separate area given that technology systems vary widely and care needs to be provided by veterinarians, and that the responsible public departments and evidentiary laws differ from livestock farming.

In technical cooperation projects as well, although it is preferred that both livestock farming and animal health are combined in working-level activities, in the case of projects for the organizational reinforcement of governments or local autonomous bodies, specializing in one or the other will enable more concentrated and effective support to be provided.

3) Connection with other mid-term objectives

In relation to Mid-Term Objective 1-8 "More careful consideration of the environment," there have been criticisms that livestock farming causes environmental degradation due to overgrazing, leads to conflict over water and grasslands, and results in substantial rises in food prices due to increases in demand for grain feed. It is also related to Mid-Term Objective 2-1 "Formulating food supply/demand policy." In developing countries, the amount of livestock products consumed has increased significantly as a consequence of economic development, and while the size of livestock herds will also increase significantly, the increased production of grain feed will cover only half of this demand. These problems cannot be resolved from within the area of livestock farming alone: JICA will need to single out the preferred direction for the development of livestock farming in developing countries while maintaining contact and cooperation with other fields of agricultural

and rural development.³⁶

(2) Current state of JICA projects

JICA's technical cooperation in livestock farming has so far focused primarily on Southeast Asia and Central and South America, and has covered such areas of cooperation as livestock production (including breeding, dairy farming, livestock farming infrastructure and feed production) and animal health. In recent years, particularly in the original ASEAN member countries, projects for the transfer of technology for livestock farming are approaching their conclusion, and so efforts have shifted to South-South cooperation like third-country training, and to region-wide cooperation covering multiple countries in the area of animal health. In Africa, despite the appreciable dispatch of Japan Overseas Cooperation Volunteers (JOCV), there are still few technical cooperation projects.

Within livestock farming, beef production and dairy farming in particular are two industries in which unused local resources, such as agricultural by-products and the grass growing on the ridges between fields, can be used as feed. They have also become an important component within integrated agricultural development programs such as "rural development" and "regional development" which have gained in importance in recent years.

In terms of technical cooperation in the area of dairy farming development, there is an increasing number of small-scale dairy farming projects to combat poverty in rural areas. Countries around Southeast Asia are reliant on imports from developed countries for most of their dairy products. Their current self-sufficiency ratios for milk are low across the board, ranging from 0.9 percent to 52 percent.³⁷ Small-scale dairy farming development is expected to have various advantages for poor farmers, including: (1) securing a continuous source of income; (2) promoting the diversification of management; (3) promoting the efficient use of local resources and the sustainable conservation of the environment; (4) providing a source of good quality animal protein for residents; (5) facilitating farmers to participate in the market economy and to undertake studies; (6) increasing employment in rural areas; and (7) promoting the activities of cooperative organizations. Following is a specific example of a project in this area.

• Technical Cooperation Project: (Sri Lanka) Small Scale Dairy Farming Improvement through Genetic and Feeding Management Improvement Project (GFMI Project) (April 2009 to March 2014)

For the purpose of developing the technical and structural base for improving small-scale dairy farming through better breeding, feeding and dairy management in the target areas, this project involves: (1) the establishment of appropriate progeny testing methods; (2) improvements in technology related to artificial insemination; and (3) improvements in technology for feeding and dairy management.

³⁶ Saito, Katsuro (2010) *JICA's Cooperation in the Field of Agricultural and Rural Development*, Sustainable Livestock Production and Human Welfare, Vol. 64, No. 1

³⁷ FAO STAT (2010)

A recent feature in the area of animal health has been the take-up of cross-border, region-wide projects in the wake of the outbreak of avian influenza. Following are two specific examples of projects in this area.

• Technical Cooperation Project (region-wide): Regional Cooperation Project for Animal Disease Control Among Cambodia, Lao P.D.R., Malaysia, Myanmar, Thailand and Vietnam Phase II (February 2008 to February 2011)

For the purpose of establishing a surveillance structure for cross-border animal diseases at the field (pilot site), local and central level, this project involved: (1) entrenching surveillance techniques for animal diseases; (2) improving surveillance information systems for animal diseases; and (3) building a framework for animal disease surveillance at the regional level (among the six member countries).

• Technical Cooperation Project (region-wide): Capacity Development for Improvement of Livestock Hygiene in the Southern Part of South America through Regional Technical Cooperation (August 2005 to July 2010)

With an aim of utilizing information collected by regional veterinarians in projects, this project involved: (1) building a regional coordination system; (2) preparing reports on project themes; (3) forming region-wide research groups; and (4) dissemination information that can be used by local veterinarians and producers.

In recent years, although there have been few examples of loan aid cooperation in the livestock sector, effective cooperation has been achieved with respect to grant aid. For instance, the Project on Capacity Development of Animal Health Laboratory is scheduled to commence in 2011. This is a technical cooperation project based at the Disease Investigation Center, which was constructed in 2008 as part of the Project for Improvement of Animal Health Laboratories for Diagnoses of Avian Influenza and Other Major Diseases of Animals in Indonesia.

(3) Issues in implementing projects

With respect to the development of livestock farming infrastructure and the procurement of equipment and materials, it needs to be remembered that livestock farming in developing countries has formed on the basis of inadequate production infrastructure, with most livestock farmers keeping cattle around their own homes. In many cases, because the materials distributed for livestock farming are of poor quality and maintenance and management systems are fragile, it is not possible to create an ideal environment for livestock, thus hindering any improvement in productivity.

With respect to animal health, various conditions are required in order to control disease effectively, including: (1) political and social stability; (2) access by veterinary technicians to all livestock; (3) supply and administration of vaccinations; (4) an effective disease surveillance system and the early detection of suspected cases of infection; and (5) the commitment of human and material resources for implementing countermeasures in the event of an outbreak of disease. However, most developing countries would find it difficult satisfying even some of these conditions. Moreover, they are also often politically vulnerable, with administrative divisions within the same government competing over limited financial and human resources.

A significant advantage of region-wide cooperation is that it enables activities to be conducted simultaneously in multiple countries, and through the sharing of technologies, human resources and information, it enables cooperative relations within a region to be strengthened. Nevertheless, even supposing it is possible to set major common issues and goals for the region, standardizing specific activities and outputs will not always be easy given that different countries have different conditions and priorities. Furthermore, given that JICA's implementation system is based on bilateral cooperation, two potential challenges are its response to region-wide cooperation and its further development of systems aimed at the harmonious cooperation among the relevant offices of each country.

(4) Points for concern in extending cooperation

With technical cooperation in the area of livestock farming, because the feeding of animals is viewed as part of the existing mixed farming system conducted by farmers, consideration needs to be given to the reasonableness of all production activities as a whole. Thus, an appropriate approach is needed which correctly ascertains which functions should be extended.

Based on a technical cooperation project, the scheme needs to start gradually with cooperation related to improving animal husbandry management, feed production and animal health, before shifting to breeding-related technology in accordance with the stage of development. At the same time, providing support on ways of using the instructed technology and on improving systems and mechanisms is also compelling for the partner country, and is also important from the perspective of self-reliance. Furthermore, it is also necessary to perform the role of developing the next generation of human resources working in cooperation, such as by cooperating with JICA volunteers and getting them to experience technology dissemination at the grass-roots level.

In planning and implementing region-wide cooperation, on a basis of conventional bilateral cooperation with each country, consider actively and flexibly incorporating third-country experts and third-country training, utilizing the technical resources of medium-developed countries.

Furthermore, because women play a crucial role in livestock farming, due consideration needs to be given to any increase in workload and any changes in benefits for women as a consequence of development.

Mid-Term Objective 1-8: Promoting agricultural extension

- (1) Summary of concept
 - 1) Scope of mid-term objective

"Extension" is defined as the act of bringing about some kind of change by transferring mindsets, attitudes, knowledge and technologies, etc. from person to person, or from group to group.³⁸ It is the act of using agricultural extension workers and the like to take appropriate technology developed through testing and research, technology developed by farmers as well as existing technology, and broadly disseminating it to farmers.

2) Specific details of cooperation activities

There are many and varied actors responsible for disseminating agricultural technology, such as researchers, extension workers, farmers' organizations, farmers, NGOs and private enterprises. The flow of technology transferred to farmers through these actors can be divided into: (1) dissemination through extension workers and agricultural extension centers; and (2) dissemination from farmer to farmer.

- (i) For efficient and effective dissemination through extension workers, etc., it is necessary: (1) to improve dissemination systems, such as by establishing extension centers and expanding extension departments in local governments, (2) to improve dissemination methods, such as by creating model farms, developing dissemination manuals and materials and providing training for farmers in workshops; (3) to strengthen the capacities of extension workers through training and guidance; (4) to improve the efficiency of extension workers' time spent with farmers; and (5) to select technologies.
- (ii) Types of farmer-to-farmer (FTF) extension³⁹ include: the method whereby, inspired by the livelihood improvement of a neighboring farmer, farmers ask to be taught by an exemplary farmer in the local area, and technology is thus spread; and the method whereby farmers are trained in a systematic matter, resulting in the gradual spread of technology to surrounding farmers. There is also the case where farmers stick to agricultural technology that has been handed down from generation to generation.
- 3) Connection with other mid-term objectives

In order for agricultural technology to be widely disseminated to farmers, thereby bringing about increased agricultural production and improved productivity, it is important to develop appropriate technology, as stated in Mid-Term Objective 1-10 "Capacity building for research and development." Furthermore, improvements in technology by farmers relates to both Mid-Term Objectives 1-7 "Farmers' organizations" and 1-8 "Agricultural financing."

³⁸ Extension Officers Handbook, Japan Agricultural Development and Extension Association

³⁹ Another type of FTF is the mechanism whereby a base for promoting the spread of agriculture is established within a village, and then using this as an intermediary, extension workers provide technical guidance and technical information to individual farmers.

(2) Current state of JICA projects

In many of its technical cooperation projects in the field of agriculture, JICA has tackled the dissemination of technology to farmers as a key issue. As part of this, based on systems of dissemination such as FTF and T&V (Training and Visit), which was initiated by the World Bank in the 1970s, JICA has carried out capacity building by applying a combination of specific dissemination methods (approaches) such as the development of technology, transfer of technology and training of farmers.

In past technical cooperation projects, "research and development based at agricultural technology centers," "training of extension workers" and "extension to farmers" were viewed as an integrated flow continuing from upstream to downstream, and there are many instances of initiatives aimed at the cascading spread of technology. For example, in the Project on the Development and Promotion of Location-Specific Integrated High-Yielding Rice Technologies in the Philippines (November 2004 to November 2009), the Philippine Rice Research Institute (PhilRice), which had been established as a research facility funded by grant aid, developed high-yielding rice technologies matching the agricultural conditions of the local area, and conducted activities to establish a system for disseminating those technologies.⁴⁰

While initiatives like this could be adopted in various regions, given the costs and time needed to build and maintain dissemination systems and the problems related to the top-down approach, and in response to such situations as the weakening of dissemination systems due to the structural reforms promoted from the 1980s, initiatives were advanced dealing with these issues.

Furthermore, as a result of the previous top-down dissemination approach, there was a case where technologies were developed which were unmatched to the needs of farmers, and which could only be used by a small number of farmers. In order to ameliorate this case, the Smallholder Horticultural Empowerment Project (November 2006 to November 2009) was implemented in Kenya. Under this technical cooperation project, a participatory dissemination method was adopted, whereby technology was developed and disseminated, with farmers actively participating in the project from the planning stage.

In countries where too few extension workers have been deployed, efforts have been made to utilize exemplary farmers in the local area, and dissemination has been tackled by utilizing the private sector. For example, in the Project for the Dissemination of High-Quality Rice Seeds for Small-Scale Farmers in Bolivia (technical cooperation project, August 2000 to July 2005), in order to utilize NGO personnel as extension workers, a mechanism for securing working capital was established, and the project was designed so that the NGO could continue activities even after the conclusion of the project.

In addition, through volunteer programs, techniques for cultivating vegetables and rice have been disseminated by JOCVs at the grass-roots level, and through training programs, agricultural extension workers have been accepted for training in Japan.

⁴⁰ See JICA website (http://www.jica.go.jp/project/philippines/0600881/01/index.html)

• Loan Aid: (India) Rajasthan Minor Irrigation Improvement Project (L/A signing date: March 31, 2005)

Even compared to other Indian states, the state of Rajasthan has very little rainfall. The aim of this project is to increase agricultural production in Rajasthan, by making improvements to the existing small-scale irrigation facilities that are scattered around the state and by disseminating water management and agricultural technology, thereby helping to raise farming income and reduce poverty. The project has involved: (1) repair work to small-scale irrigation facilities (415 sub-projects are planned); (2) the provision of technical support (guidance in farm management, components to combat malaria and poverty, formation and capacity building of irrigation associations, and the capacity building of government staff); and (3) the provision of consulting services.

(3) Issues in implementing projects

There are four issues in promoting the dissemination of agricultural technology: (1) selection of technologies based on an awareness of the stage of development, (2) selection of appropriate dissemination methods, (3) development of dissemination systems supporting the introduction of new technologies, and (4) development of infrastructure necessary for the introduction of new technologies.

1) Selection of technologies based on an awareness of the stage of development

In recent years, the developmental process of agriculture has been influenced by a variety of factors, such as the rapid advance of globalization and, depending on the country, the transition from a socialist economic structure. Still, it is thought that agriculture basically starts off focused on self-sufficiency at an individual household level, and once it has achieved this stage, it then proceeds to develop growing districts, selling excess grain and gradually introducing commercial vegetable crops, before finally transitioning to market-oriented agriculture in anticipation of exporting products. Nevertheless, it is not easy to introduce appropriate technology in a way which takes full account of the stage of agricultural development in the local area and the stage of development of the domestic markets.

2) Selection of appropriate dissemination methods

By nature, agriculture is an industry heavily dependent on the natural conditions and social conditions of the local area, and while it is preferable that agriculture be developed and used on a case by case basis in all growing districts, it is physically impossible to deploy researchers and extension workers to all growing districts where conditions are different.

Furthermore, dissemination methods that are highly effective tend to also be costly.

3) Development of dissemination systems supporting the introduction of new technologies

During the project period when efforts are being made for dissemination activities, introducing educational materials and means of transportation is possible, and sometimes it is even possible to extend this to the introduction of agricultural materials and simple facilities. However, once the project concludes, often there is a decline in the level of personnel and activity expenses at the counterpart agency. Furthermore, initiatives for dissemination take time to produce results, and so changing to an extension system is difficult during a short project period.

4) Development of infrastructure necessary for the introduction of new technologies

One reason why a model project that ends in success does not spread to other regions after its conclusion is that, often, the capital required for introducing technology is not provided (land, water, distribution network, initial investments of individual farmers, etc.). Usually, it is the responsibility of the government of the partner country to spread technology to other regions after the initial transfer.

(4) Points for concern in extending cooperation

When formulating an individual project, two points always need to be kept in mind: selection of technologies according to the stage of development; and examination of dissemination methods and supporters of dissemination in line with the social and economic conditions of the country or region. It is important therefore for the organization to accumulate and share its summary of the stages of development for enabling such an approach and its systematization of the introduced technology and dissemination methods.

Strengthening the partner country's dissemination systems is also crucial for the effective transfer of technology, but at the same time, an issue is that it takes a certain amount of time for this to produce specific results. It is important therefore to first share an awareness of the medium- and long-term issues through policy discussions with the partner country, and then to provide program-based assistance. Since it is possible that, when providing this kind of program-based assistance, any undeveloped production infrastructure will hamper the spread of technology, it is also important to consider promoting loan aid and grant aid in an integrated manner.

Also, in order to supplement such a weakened agricultural extension system, dissemination methods need to be presented which address the various situations in developing countries, and which also incorporate an approach of participatory rural development and farmer-to-farmer dissemination.

1) Selection of technologies based on an awareness of the stage of development

At the project implementation stage, actual agricultural conditions in the partner country or region need to be properly evaluated, and the general framework of technology to be introduced needs to be solidified in view of Japan's experiences and technologies.

An important matter to keep in mind at this point in time is the stage of agricultural development of each country or region. Since the required technologies and technical standards differ for each stage, the stage of agricultural development in the local area and the stage of development of the domestic markets need to be properly evaluated before consideration is given to the introduction of appropriate technology.

2) Selection of appropriate dissemination methods

In order to disseminate technology and knowledge efficiently, effectively and swiftly, appropriate dissemination methods are needed for communicating specialized theory and technology and for translating it into practice.

In developing and disseminating agricultural technology, it is important to: (1) collect, systematically organize and classify technologies so that common methods can be introduced in regions with similar conditions; and (2) to clarify what government organizations ought to do, what the private sector can do, and what farmers can do themselves, and to improve efficiencies as much as possible.

In a number of developing countries around Central and South America, dissemination systems tend to weaken as a consequence of revisions to extension worker systems, and the contributors to dissemination tend to diversify. Accordingly, when considering dissemination methods, it is necessary to ascertain the merits and demerits of the various contributors, before promoting appropriate cooperation among them.

As for methods of dissemination, there is a diverse range, from using pilot farms, farmer schools and research centers, to utilizing different media such as pamphlets and radio. The merits and demerits of these methods need to be summarized, before introducing dissemination methods that the government of the partner country can afford.

3) Development of dissemination systems supporting the introduction of new technologies

In order to enhance the sustainability and ripple effect of dissemination activities, starting during the project period, dissemination needs to be incorporated into the recipient government's agricultural policy, and approaches for securing the business budget need to be made in advance.

4) Development of infrastructure necessary for the introduction of new technologies

The beneficial effects provided by technical cooperation need to be heightened by financially supporting the injection of capital needed for wide-area expansion.

Mid-Term Objective 1-9: Farmers' organizations

- (1) Summary of concept
 - 1) Scope of mid-term objective

The objective of creating farmer organizations is so they can deal with problems that could not otherwise be successfully or effectively resolved by individual farmers, by making effective use of production technology, production infrastructure and distribution and financing systems, which will lead to higher incomes. Farmers' organizations include irrigation associations, agricultural cooperatives and small-scale farmer groups. The purpose of their activities is wide and varied, from water management at terminal facilities, to joint production, collection and shipment, selling, credit, purchasing and processing.

2) Specific details of cooperation activities

Farmers' organizations are developed in a way that independent and constructive activities can be conducted with autonomous participation by farmers, after first making farmers aware of the merits to be had from improved agricultural management, proper facilities management and joint marketing as well as of the incentives for livelihood improvement.

In creating farmer organizations, instead of initially aiming for complex organizations like the general agricultural cooperatives found in Japan, efforts start with the development of organizations designed to achieve specific goals in production, marketing and water management according to immediate needs.

3) Connection with other mid-term objectives

Mid-Term Objective 1-3 "Securing agricultural production equipment/materials, improving their use"

In particular, this mid-term objective bears relation to various fields depending on the purpose of activities conducted by the farmers' organization. For example, when developing irrigation associations, since there is a close connection to Mid-Term Objective 1-2 "Improving, maintaining and managing production infrastructure," namely improvement of infrastructure, conservation of agricultural land and water management, there needs to be clarification of the project's main points for support.

- (2) Current state of JICA projects
 - 1) Projects for the formation of irrigation associations
 - Technical Cooperation Project: (Sri Lanka) Project on Increasing the Capacity of Integrated Management in Irrigated Agriculture in Dry Zone (June 2007 to May 2011)

The aim of this project is for the development of farmers' organizations, using revolving funds as incentive. The project trains government staff and extension

workers, and then extension workers provide support for the establishment of organizations and subcommittees by farmers.

- 2) Projects for the formation of small-scale farmer groups
 - Technical Cooperation Project: (Indonesia) Project on Strengthening Sulawesi Rural Community Development to Support Poverty Alleviation Programmes (March 1997 to February 2002)

A grant-aided project in which engaged NGOs encourage farmers and support is provided for the formation of groups on a basis of villages.

• Technical Cooperation Project (Kenya) Smallholder Horticulture Empowerment Project (November 2006 to November 2009)

For the purpose of building the operational capacity of smallholder horticulture farmer groups in the project area, the project involved: (1) the appropriate sale of horticultural crops by target farmer groups; (2) improvement in the quantity and quality of horticultural crops produced by target farmer groups; and (3) development of the capacity of target farmer groups to improve production infrastructure and distribution infrastructure.

• Loan Aid: (Paraguay) Agricultural Sector Strengthening Project II (L/A signing date: August 10, 1998)

This project is comprised of two parts: assistance for small-scale farmers led by the Ministry of Agriculture and Livestock (MAG), and assistance for medium-scale farmers extended by the National Development Bank (BNF). The former is further comprised of three sub-projects ((1) small-scale infrastructure improvements, (2) granting of capital investment funds to small-scale farmers, and (3) granting of capital investment funds to farmers' organizations). Through this, agricultural technology has been disseminated to small-scale farmers through model farmers, support has been provided for the creation of farmers' organizations, rural roads have been upgraded and water supply facilities have been installed.

- 3) Strengthening the functions of farmers' organizations and agricultural cooperatives
 - Technical Cooperation Project: (Viet Nam) Enhancing Functions of Agricultural Cooperatives (March 2006 to September 2010)

Selling (joint purchasing), credit business, training of cooperative members, and network activities between agricultural cooperatives were conducted in a comprehensive manner like in Japan.

• Loan Aid: (Thailand) Project for Revitalization of the Deteriorated Environment in the Land Reform Areas through Integrated Agricultural Development (L/A signing date: September 30, 1998)

The aim of this project is to disseminate systematic agriculture through the

construction of farm ponds and development of surrounding infrastructure. In most target districts, rural networks were created and community markets were developed. Through consulting services that include farming support and measures for the creation of farmers' organizations, efforts have been made for the improvement of farmer livelihoods and for capacity building of whole communities via the activities of farmer groups.

4) Development of tools for creating farmers' organizations

Other projects implemented by JICA in the past have included the provision of indirect cooperation through the lending of venues, equipment and materials for the manufacture and sale of processed agricultural goods, handicrafts and other such products, as a tool for the creation of farmers' organizations. In other words, through this way of utilizing farmers' organizations, they have the potential to also lead to improvements in non-farming income.

5) Human resources development and training for establishing and administering farmers' organizations

JICA provides lectures and study tours with respect to such topics as farmers' organizations, agricultural cooperatives, land improvement districts, distribution of agricultural products, agricultural financing, livelihood improvement projects, and the participation of women in management, such as through the training programs outlined below.⁴¹

• Training and Dialogue Program: Integrated Agriculture and Rural Development through the Participation of Local Farmers(JICA Tsukuba, 2006 to 2010)

This program is designed to promote the formulation of rural development plans that incorporate the needs of local farmers by getting participants to acquire techniques for preparing rural development plans, techniques for managing farmers' organizations, and techniques for participatory rural development used in Japan.

• Training and Dialogue Program: The Role of Agricultural Cooperatives to be Played in Activation of Rural Economy (JICA Tsukuba, 2005 to 2009)

The aim of this program is for participants to formulate action plans for improving farmers' organizations or farmer organizations in their own countries so as to promote the organization of agricultural cooperatives and to strengthen their operational capacity, thereby revitalizing their rural economies.

(3) Issues in implementing projects

In many developing countries, the development of human resources and the establishment of systems and guidelines for revitalizing existing organizations and/or setting up new farmer organizations have been inadequate. In some cases, central and local government systems and legal support systems have not been ensured, meaning

⁴¹ *Outline of JICA Training and Dialogue Programs* (2009)

that farmers' organizations have not been operated effectively.

In particular, even where grant-aided projects and revolving funds have been prepared as incentives, there are cases where the farmers' organizations cannot utilize such resources.

It should be noted that there is no single model of farmers' organization that can be applied universally: appropriate operation of an organization is only possible where it has been designed taking into account the methods best suited to the conditions of the target farmers and the target area.

(4) Points for concern in extending cooperation

Using the example of setting up an irrigation association, if farmers' organizations already exist, then active efforts need to be made for the activities of these organizations and for fostering a sense of solidarity.

Conversely, if no such organizations exist, new irrigation associations comprised of farmers have to be set up with the help of donors. In these cases, incentives are needed if the farmers are to carry out coordinated activities and pay for the water charges and other costs. The greatest incentive for farmers is to see their production increase and income grow, and for this purpose, not only is it necessary to draw water to their farmland through irrigation projects, but also to provide technical assistance for farm management and to improve their marketing and other areas of business. Only when all these come together, will sustainable management of irrigation associations become possible.

When setting up new farmers' organizations, consideration needs to be given so that, after the period of donor cooperation ends, farmers are able to manage the organizations properly on their own.

More often than not, the creation of farmer organizations is part of an integrated agricultural development project. In order to better sustain the results of technical cooperation effectively, however, more emphasis needs to be placed on efforts for creating farmer organizations.

Although loan aid and grant aid in agriculture is most commonly for the development of irrigation facilities, without irrigation associations, such facilities cannot even be used. Except where the development of irrigation associations is provided as a "soft" component of loan aid, it is vitally important that there be coordination with technical cooperation in the location where financial aid is being provided.

The following lessons have been learned from past projects.

• Legislation such as provincial ordinances and governor executive orders form the legal basis for implementing a participatory development project in a rural community based on support from a project. It has been recognized that such legislation is extremely important for carrying out project activities and for the self-sustaining expansion of project outputs.

• Resident-driven activities require a wide range of needs to be grasped, including those for production, distribution, resources management and environmental management, and appropriate technical support that addresses these needs to be provided. Particularly given that residents have a high level of need for marketing and other economic activity in which government organizations have no experience, it is important to secure resources that they can utilize as experts. Furthermore, in addition to determining the superficial wants and genuine needs from among their requests, specific aid measures need to be drawn up based on an accurate understanding of the residents' own ability to achieve their objectives.

Box 1 Examples of farmers' organizations in Japan

- There have been cases in Japan of small-scale farmers receiving government assistance and working together to successfully compete against small and medium enterprises and against industry. These cases ought to also be helpful in creating farmer organizations. Two typical examples are agricultural cooperatives and land improvement districts.
- Modeled after the German system in 1900, institutionalized industrial associations were democratized in 1947 and re-launched as agricultural cooperatives. Positioned at the national, prefectural and municipal levels, they are large organizations with about one million members in all parts of the country. In terms of their content, there are general agricultural cooperatives and specialized agricultural cooperatives.
- Based on the Land Improvement Act, which was enacted in 1949, land improvement districts are farmers' organizations engaged in the management of irrigation canals and other irrigation facilities as well as in the collection of water charges. As corporations based on the territorial principle, they performed a prominent role in implementing and managing irrigation, drainage, reclamation by clearing, reclamation by drainage and restoration work after the World War II. Even before then, water management in Japan had long been led by farmers.
- Associated infrastructure is managed by the state, prefecture or organization depending on its size. However, in all cases, on a basis of farmer initiative and copayment, independent farmers' organizations play a key part, subsidized by national and local government finances.
- ➤ In recent technical cooperation as well, Japan's expertise on land improvement districts and agricultural cooperatives has been utilized in the development of farmers' organizations in developing countries.

Box 2 Purpose-specific farmers' organizations and benefits of organization

- Water management: Farmers' organizations for the efficient use of irrigation facilities. Rather than local governments, by having farmers take a central role in the allocation of water resources, collection of water charges and management and repair of facilities, not only will the autonomy of farmers be heightened, but they will also be able to increase the volume of crop production in the local area.
- Selling: By forming organizations and dealing in substantial quantities, even small-scale farmers lacking market access and bargaining power are able to sell their produce on favorable terms.
- Purchasing: Small-scale farmers are able to secure resources with certainty through joint purchasing, as well as make purchases at advantageous prices by procuring in bulk.
- Credit: By forming organizations, farmers without credit security are also able to gain credit for obtaining small loans and making joint repayments. There are also examples where revolving funds are used within the organization.
- Production: By creating organizations, farmers are able to communally use equipment and materials, thereby reducing production costs. The technical level of farmers is also more easily raised.
- Processing: By working as an organization, farmers are able to make full use of labor in the off-season while lessoning their financial burden when introducing and maintaining processing equipment, leading to increases in their non-farming income.

Mid-Term Objective 1-9, Reference: Improving farm management

In developing countries, circumstances surrounding farm management are difficult because various subsidy and price-guarantee systems have been scaled back under structural adjustment policies and also because systems for the support of farmers including technology dissemination and lending systems are insufficient.

Against this background, here, we will discuss the ways and means of improving farm management, namely improving the management capacity of individual farmers, enriching financing systems for farmers, and creating farmer organizations. Coming under the category of improving the management capacity of farmers are reforms in technology and management policies of individual farmers, an increase in added values, marketing with advantageous prices and various government-run subsidy and price-guarantee systems. Technical improvements by individual farmers include a farm management system aimed at achieving high production volumes through a combination of plant cultivation and livestock raising.⁴²

Improving the management capacity of farmers is necessary because it leads to increased incomes, higher social standing and economic independence. Here, it should be stressed that a farming family, even a small-scale, single-household one, is an independent management entity that, rising from a level of merely satisfying its own needs, tries to improve its revenue and income by pouring labor and capital into agriculture. From this perspective, it is

⁴² A specific example of this form of agriculture combines agroforestry and livestock raising.

necessary for us to keep in mind that farmers, exercising their own judgment, are always attempting to increase revenue and income with small labor and capital.

One of the challenges in terms of financing is to build the capacity of local residents as borrowers ((1) capacity to negotiate with financial institutions, (2) capacity to keep accounts, and (3) capacity to repay loans) and also to raise their capacity to save, a step that will also help financial institutions manage themselves smoothly.

In creating farmer organizations, it is necessary to develop community-based organizations and producer organizations, such as cooperatives, irrigation associations and collection and shipment associations, so they can make effective use of production technology, production infrastructure and distribution and financing systems, which will lead to higher incomes, and also so they can deal with problems that could not otherwise be successfully or effectively resolved by individual farmers. In developing these organizations, they need to be operated in an independent and constructive manner with autonomous participation by farmers and with consideration given to gender balance, after first making farmers aware of the merits to be had from improved agricultural management, proper facilities management and joint marketing as well as of the incentives for livelihood improvement. The development of irrigation associations and land improvement districts⁴³ is essential in this day and age when maintenance of irrigation facilities and efficient end water management are considered important. In creating farmer organizations, instead of creating complex organizations like the general agricultural cooperatives found in Japan, it is important to start with the development of organizations designed to achieve specific goals in production, marketing and water management according to immediate needs.

With respect to JICA's activities for improving farm management, because the majority of recipients of technical cooperation, for instance, are administrative, testing and research organizations run by the recipient government, even supposing that farmers directly receive the training provided through the JICA project, there is not necessarily all that much assistance that is of direct benefit to improving management capacity at the level of individual farmers.

JICA has been strengthening financing for farmers as part of its activities involving agricultural cooperatives, integrated agricultural development projects and training courses in Japan. Although agricultural financing brings great benefits to farmers, ingenuity is required, such as providing agricultural financing through loan aid, providing materials that will lead to the creation of capital, or making use of a portion of funds set aside for verification projects.⁴⁴

More often than not, the creation of farmer organizations is part of other plans, like those for strengthening irrigation associations in irrigation projects and for improving agricultural cooperatives in integrated agricultural development projects. In order to better sustain the results of cooperation effectively, however, more emphasis needs to be placed on efforts for creating farmer organizations.

⁴³ In accordance with the Land Improvement Act, which was enacted in 1949, water resources in Japan, including the construction and management of irrigation and drainage facilities, are managed by "land improvement districts" comprised of local farmers.

⁴⁴ Examples include: (Kenya) The Study on the Integrated Rural Development Project in the Baringo Semi-Arid Land Area, and the Study of Prevention for Desertification in the South Region of Segou in the Republic of Mali.

Mid-Term Objective 1-10: Agricultural financing

- (1) Summary of concept
 - 1) Scope of mid-term objective

Agricultural financing shows promise as having significant beneficial effects, such as in improving farm management, developing agricultural infrastructure and promoting agribusiness. Here, it is defined as agricultural financing, including all loan facilities for farmers and agribusiness operators. In addition to institutional financing by the government and loans by ordinary financial institutions to farmers and agribusiness operators, agricultural financing also includes small credit loans like microfinance, which is available to the poor and low-income earners without collateral constraints, as well as savings and other financial services.

Agricultural insurance shall also be covered in this section as an area related to agricultural financing.

2) Specific details of cooperation activities

Main activities in agricultural financing include the creation of farmer organizations, development of institutions and provision of equipment for using loans, through technical cooperation, and assistance for preparing funds utilizing loan aid. Cooperation for considering loan facilities for agribusiness operators (rice millers, processors, distributors and dealers) in collaboration with central governments is also feasible for promoting agriculture as an industry. Furthermore, although examples of current efforts cannot be confirmed, technical support (improvement of agricultural statistics, risk evaluation) and fiscal support (loans) aimed at the introduction and/or improvement of agricultural insurance programs can be considered.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-3 "Securing agricultural production equipment/materials, improving their use" and 1-6 "Promoting the livestock sector." Particularly in cases where agricultural financing is of the type managed by farmers' organizations, because this relates to Mid-Term Objective 1-7 "Farmers' organizations," perspectives of organizational development and functional enhancement will be needed.

- (2) Current state of JICA projects
 - Loan Aid: (Thailand) Agricultural Credit for Rural Development and Job Creation Project (L/A signing date: September 30, 1998)

In line with the key objectives of the Eighth National Economic and Social Development Plan, in addition to improving the efficiency of agricultural production activities, improving the quality of agricultural products, promoting afforestation and promoting environmental agriculture, this project aimed to provide employment opportunities in rural areas in order to respond to the currency and economic crisis at the time. Loans through the Bank for Agriculture and Agricultural Cooperatives

(BAAC) have been primarily used to finance the provision of sub-loans to small-scale farmers in regional areas and to employ consultants to strengthen accounting management and the monitoring of yen-loan projects.

• Loan Aid: (Sri Lanka) Poverty Alleviation Micro Finance Project (II) (L/A signing date: July 29, 2008)

By providing funds to poor living in the North-East and surrounding regions where the poverty rate is high, and by carrying out training for participating financial institutions, microfinance assistance organizations and beneficiaries, the objective of this project is to increase the incomes of the poor, thereby contributing to poverty alleviation and greater social and economic stability. The project involves: (1) loans for the poor; (2) procurement of equipment necessary for project supervision and monitoring; (3) consulting services (capacity building for participating financial institutions and microfinance assistance organizations, assistance by microfinance assistance organizations for strengthening activities for increasing the incomes of targeted beneficiaries, etc.).

• Technical Cooperation Project: (Ghana) The Small-Scale Irrigated Agriculture Promotion Project (August 1997 to July 2002)

The aim of this project is, in irrigated agriculture areas, to rehabilitate irrigation facilities through grant aid and to establish a model farming system through technical cooperation. Using such methods as revitalizing the cooperatives based on involvement of the farmers themselves and entrusting the management of the cooperatives to them (funds management, procurement of input goods, waterways, etc.), the project emphasizes the initiative of farmers. Micro-credit (for operating inputs such as seeds and fertilizer) is working well, and with management undertaken by farmer associations, productivity increased.

• Technical Cooperation for Development Planning: (Mali) Study of Prevention for Desertification in the South Region of Segou in the Republic of Mali (August 2004 to January 2008)

In this project, JICA provided a safe, and by using the savings of local residents and their share of business expenses to fund loans, successfully enhanced the ownership of local residents. As a result, a repayment rate of 99 percent has been achieved, and the system has since been ongoing. The project demonstrated that it is also possible to use JICA's existing schemes for sustainable financial systems that meet the needs of local residents.

• Training and Dialogue Program: Strengthening Role and Function of Farmers' Organization in Central Asian Countries (JICA Sapporo, 2009 to 2011)

As part of its courses on farmers' organizations, JICA has a track record in training on "agricultural financing."

(3) Issues in implementing projects

A challenge in lending money is how to accommodate farmers and local residents with

loans, or in other words, how to advance funds to the poor, who until then had been ineligible for institutional finance, thereby bringing stability to their agricultural production and life and improving their living standards.

In most cases, implementing agencies in partner countries have insufficient business experience in agricultural financing targeted at small-scale and subsistence farmers, and so when providing support, attention needs to be given to both the organizational and institutional development of lenders as well as the capacity building of borrowers. Furthermore, since many initiatives are targeted at low-income earners actively engaged in economic activity, providing service to the poorest of the poor who lack any sources of income is difficult.

On the other hand, lending money to farmers also entails the risk of bringing further pressure to bear on their business operation. For example, in Senegal, a usual practice for many farmers is to grow rice by purchasing seed rice and fertilizer funded by loans from agricultural finance corporation, and then to repay those loans by selling the rice they produce. However, there are many examples of farmers who struggle to repay their loans such as due to declines in retail prices or to unexpected natural disasters.

When it comes to agriculture dependent on the natural conditions of the local area for growing crops, meteorological disasters are a perennial risk. The effects are particularly significant for rain-fed agriculture where there are no prospects of a stable water supply, and is one of the main reasons why farmers are unable to make appropriate agricultural investments. In such circumstances, agricultural insurance is one means for encouraging the sound development of agriculture by having the government and private insurance companies bear some of the risks faced by farmers. Bringing agricultural insurance into operation though does involve certain institutional challenges (development of legal and executive systems, cooperation with the private sector and division of roles), technical challenges (improvement of agricultural statistical systems and risk-evaluation technologies) and fiscal challenges (securing financial resources for public assistance).

(4) Points for concern in extending cooperation

When providing support for agricultural financing as part of a project, given that the capacity of the responsible organization and its policy for future development have a decisive influence on the sustainability of the project, if the sustainable financial system is being built through an NGO, attention needs to be paid to the mission of that NGO.

For example, the World Bank Group lists four measures in this area for "increasing access to finance": (1) microfinance; (2) interlocking financing arrangements through contract farming; (3) "smart" subsidies for creating bankable clients; and (4) support for land-leasing markets.⁴⁵

In terms of cooperation by JICA, one possibility is technical cooperation schemes for community-based organizational support where farmer associations and community-based organizations take ownership. Even if capital needs to be injected into the project, one way would be to cooperate with other lending institutions and for JICA to concentrate on building the capacity of local residents capable of utilizing funds

⁴⁵ World Bank Group Agriculture Action Plan FY2010-2012

independently.

In terms of financial aid, previously, funding agricultural loans directly from the budget was not possible within the framework of technical cooperation. However, under the new JICA, it is now possible to provide funds to financial institutions dealing in agricultural financing loans by making use of "two-step" loans in loan aid. Furthermore, it is still possible to use counterpart funds to cover small-scale financing by mutual consent with the recipient government, and these schemes need to be used effectively.

Consideration needs to be given to feasible methods suited to the actual conditions in the local area while making reference to past examples, such as the development of human resources through the acceptance of trainees and the promotion of small-scale financing linked to grass-roots grant aid.

In order to take full advantage of loans, consideration also needs to be given to compensation schemes (agricultural insurance, etc.), using the services of agricultural policy advisors, etc. for initiatives that contribute to increased productivity, such as reducing production costs, improving quality improvement and policies that strengthen the competitiveness of domestically grown rice, as well as for natural disasters and other issues that farmers would have difficulty in covering individually.

In designing agricultural financing that is autonomously managed by residents in the local community, it should be done so that the whole community can feel that it is continuously benefitting by the lending-repayment cycle functioning properly. For this to happen, community-based organizations are needed to receive the funds. Sometimes, this only needs to be at the village community level, but sometimes cooperatives or other types of associations with clear benefits of organization must be established.

Given the long, proven track record of forestry cooperatives and irrigation cooperatives, introducing credit cooperatives is easy because ownership by local residents has already formed.

As an example, in the Verification Study on the Small Scale Horticultural Development Project for Poverty Alleviation to Farmers in Coast Region (Technical Cooperation for Development Planning in Tanzania, October 1999 to March 2004), compared to villages that had no experience in financing, the repayment rate was higher in villages which had past experience in financing and in which groups had previously been formed such as through pump projects.

Furthermore, in cases where the equipment, materials or capital available to be provided is limited, an effective approach is to adopt a revolving fund-type system among a limited number of members (all members contribute every time, but each time, the equipment or materials are received by only one member). This approach has been used in a variety of projects.

Moreover, given that a revolving fund has been utilized in Sri Lanka using local human resources, and given that there are human resources in this area trained by other donors, an idea could be to utilize local resources instead of Japanese ones.

Agricultural insurance is an area in which JICA has had little experience in extending

cooperation. Ever since agreement was reached at the 1994 Uruguay Round of negotiations for "agricultural subsidies not subject to reduction commitments," there have been trial introductions of agricultural insurance, not only in developed countries, but in many other countries too, including Brazil, Turkey and Senegal. It is expected that the need for agricultural insurance will increase in the future. At present, the World Bank and a small number of other donors are working to provide support, but there are also areas in which Japan's experience could be utilized, such as the development of agricultural statistics and legal systems, and so it is worth considering the possibility of assistance in the future.

As an initiative for overcoming the problems faced by agricultural insurance programs, such as the technical difficulty of monitoring and the moral hazard resulting from this (overstatement of decline in personal income), index insurance has been progressively introduced since 2000 (whereby the amount of any compensation is determined, not by the decrease in income of individual farmers, but by using weather conditions and average yields for the whole region as indicators). Given that donor-led pilot activities are already being conducted even in developing countries, it is envisaged that the need for index insurance will also increase in the future.

Mid-Term Objective 1-10, Reference: Microfinancing

Even though community-based organizations vary a great deal, proper intervention in the three elements of development—resources, organization and norms—is an extremely effective development tool in the sense that it increases their "self-organizing capability" and brings about greater development outcomes. This is because the question of whether a community-based organization's activity can be stepped up, its functions improved, and by extension, its production increased by committing additional resources, for instance, fundamentally depends upon the function and competence of the relevant community-based organization.

In the 1980s, the success story of the Grameen Bank in Bangladesh was publicized the world over. Prior to this, it came to be recognized that loans provided to the impoverished classes, who used to be ineligible for institutional finance, have become able to stabilize their lives, and are an extremely effect means for improving their living standards and living conditions. As a consequence, the introduction of rural finance is now widely known as an indispensable measure in rural development. On the other hand, however, as shown by the two cases below, the characteristics of the local community play a major part in the introduction of rural finance, and any talk of introduction raises the question of what kind of system to adopt.

For example, in the lending business operated by the Grameen Bank, first, five residents who satisfy certain conditions form a group, and an ordinary loan, seasonal loan, home loan or other type of loan is extended to the group. As for repayments, loans are designed so that money is collected at weekly meetings, with all five members being collectively responsible. In the table below describing the basic types of community-based organizations in development, this type of community group corresponds to "A) Institution-led organization." In other words, a characteristic feature of this type of organization is that it is heavily conditional, with instructions on the organization, resources and norms all being given by the Grameen Bank.

Put the other way around, this indicates that Bangladeshi communities and community-based

organizations must conform to the Grameen Bank system (particularly with regard to organization and norms). Or perhaps that access is extremely limited, apart from NGOs that have similar systems. It also indirectly suggests that the external environment is very lacking when it comes to constructively reshaping the current functions of Bangladeshi communities and community-based organizations. The system introduced by the Grameen Bank appears to be one strategy that was devised amid such harsh circumstances.

Main types / 3 elements	Resources	Organization	Norms
A) Institution-led organization	At the expense of institution	Based on the law	Based on guidelines
B) Institution/resident cooperation-type organization	At the expense of institution/residents	Institution-based /community-based organization	Based on guidelines Based on community norms
C) Resident-led organization	At the expense of residents	Community-based organization	Based on community norms

Table 2-5 Basic types of community-based organizations in development

On the other hand, Mr. Jaime Aristotle B. Alip, founder of CARD, an NGO agricultural financial institution in the Philippines, asserts that, "The poor in rural communities are more passionate about saving money than obtaining loans (= secured by protective capability), and so current rural finance systems focused purely on loans do not accord with the reality of the poor." The financial institution he promotes is a form of credit union, and it has succeeded in expanding a business of soliciting for savings and providing loans of up to two-thirds of those savings. The community-based organizations in this case appear to belong to "B) Institution/resident cooperation-type organization." Needless to say, although the clients in this case are individual residents, it is possible to gauge the situation that their expectations for savings and the subsequent use of these is actively supported by the community environment.

Roughly speaking, the Bangladesh and Philippine cases outlined above are representative of two types of rural finance that can be picked out from the perspective of impoverished clients living in rural areas. Comparing both types in terms of the impact and effects on the three elements of development, the differences are clear. The former is no more than microcredit that primarily involves loans as a resource, whereas the latter is microfinance which is based on voluntary savings and introduces loan terms dependent on these.

These differences should not be unreservedly treated as institutional differences. Instead, they are arguably the result of a choice between systems which reflects the competence of impoverished clients in Bangladesh and the Philippines plus the social environment and other factors.

Popularizing rural finance helps the poor in different regions of the world to gain new opportunities and stability in life, by acquiring new resources and expanding their own "self-organizing capability." In the future, attempts will continue to be made to increase the effectiveness of development through rural finance and village finance mechanisms. However, whether these are effective or not will depend upon how they contribute to extending and expanding the three elements of development, namely resources, organization and norms (= function development). There is a need for appropriate judgment in regard to this perspective and to the situation into which rural finance is introduced.

Mid-Term Objective 1-11: Response to global environmental issues (climate change, biomass and conservation of biodiversity)

- (1) Summary of concept
 - 1) Scope of mid-term objective

In response to global environmental issues, offer cooperation with a focus on "climate change," "biomass" and "biodiversity."

"Climate change" can be broadly divided into mitigation strategies (reducing emissions and increasing absorption of greenhouse gases which are the cause of climate change) and adaptation strategies (reducing and responding to current and future climate change and the damage caused by its effects). Implement climate change measures that incorporate both.

"Biomass" covers: plant resources, agricultural products and wood produced for the purpose of using as resources; industrial waste, such as agricultural and forest residues, scrap wood and black liquor; excrement discharged from the livestock industry; waste from the marine industry; and wastepaper, sewage sludge and kitchen garbage from urban areas, etc.

2) Specific details of cooperation activities

The following can be considered as adaptation strategies for climate change.

- (i) Cooperation in the area of irrigation, drainage and water management
- (ii) Development and breeding of plant varieties adapted to climate change, and pest control measures
- (iii) Development of agricultural systems, such as modifications in cultivation schedules
- (iv) Measures to counter abnormal weather
- (v) Rural development based on resident participation

The following can be considered as mitigation strategies.

- (i) Introduction of renewable energy in rural areas
- (ii) Introduction of improved cooking stoves and solar cookers with an aim of reducing the amount of firewood used
- (iii) Effective use of solid manure and agricultural residues in rural areas
- (iv) Production and use of compost as an alternative to chemical fertilizers in rural areas
- (v) Introduction of agroforestry in rural areas
- (vi) Agricultural land management designed to prevent the runoff of carbon from farm soil or to promote the absorption of carbon into the soil
- (vii) Effective use of agricultural and livestock waste at the industry level
- (viii) Introduction of irrigation systems designed to conserve water and energy
- (ix) Renewable energy at the industry level of agricultural and livestock products
- (x) Introduction of energy-efficient equipment and a shift to the t y conservation of natural resources in the production and processing of agricultural and

livestock products

- (xi) Reduction in emissions of global warming gases
- (xii) Reduction in emissions from agricultural machinery and irrigation pumps

Possible strategies for "biomass" include the processing and effective use of waste discharged from the agriculture and livestock industry, the production of biodiesel from growing oil crops (jatropha, sunflower, etc.), and the production of bioethanol from growing rice straw, etc.

Possible strategies for "conservation of biodiversity" include raising awareness and providing support for residents to develop rules for sustainable agricultural and rural development, agroforestry, dissemination of economically and ecologically superior agricultural technology to curb the use of pesticides and chemical fertilizers, and improving added value such as through local specialty products and the acquisition of organic certification.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-2 "Improving, maintaining, conserving and managing production infrastructure," 1-3 "Securing agricultural production equipment/materials, improving their use," 1-6 "Promoting the livestock sector," 1-10 "Capacity building for research and development," 3-2 "Improving non-farming income" and 3-4 "Improving the rural living environment"

- 1-11-1 Response to global environmental issues (climate change)
- (2) Current state of JICA projects

The following projects are regarded as being effective for adaptation.

• Technical Cooperation for Development Planning: (Cambodia) Study on Comprehensive Agricultural Development of Prek Thnot River Basin (July 2005 to August 2008)

In this study, efforts were made to: (1) clarify the policy for improving agricultural productivity through the effective use of water resources in the Prek Thnot River Basin, by formulating a master plan for agricultural development; (2) support programs for improving the efficiency of irrigation systems by conducting feasibility studies on the rehabilitation of irrigation facilities with high priority or urgency; and (3) clarify the policy for mitigating flood damage, by formulating a flood forecast and warning plan.

The two areas judged as being particularly problematic in the target region are insufficiently developed irrigation facilities and low-yield farming techniques. It is hoped that strategies responding to these current problems will mitigate any damage incurred in the event climate change causes the seasonal bias in rainfall to become even more prominent. In other words, it is hoped that, if irrigation facilities can be improved and the effective use of water resources realized in accordance with the findings of this study, the region will have enough surplus capacity to undertake a certain degree of action even if climate change leads to increased floods and drought. Moreover, if rice farming and other agricultural operations can be practiced in a way which uses existing water resources effectively, it is also hoped that not only will agricultural productivity in the region increase, but it will also make the region more resilient at times of water shortage. This study also involves the formulation of a flood forecast and warning plan. Through this, it is hoped that taking existing measures against flood damage will also make the region more resilient and prevent any damage from worsening in the event climate change results in more frequent or more severe abnormal weather.

• Individual Expert: (Uganda) Application Technologies for NERICA Rice (June 2004 to June 2006)

In Uganda, similar to other African countries, there has been an increase in rice imports as a consequence of increased demand. This has led to an outflow of money used in purchasing the rice (foreign currency), and is having an effect on the country's food security and national finances. Accordingly, the Ugandan government has focused on promoting rice cultivation. The yield per unit area in Uganda, however, is low, and so production cannot keep pace with the increase in consumption. As a result, Uganda relies on imports for about 40 percent of its domestic consumption. In an effort to increase the volume of rice produced, the Ugandan government has promoted the introduction and dissemination of upland rice varieties. With the cooperation of the Africa Rice Center (former West Africa Rice Development Association (WARDA)), a national agricultural research organization has commenced registration work for two NERICA varieties (it recently registered one other new variety). Although the organization had undertaken to trial cultivation of the varieties and to disseminate them to farmers, due to its short history in rice-growing and lack of research, an expert was dispatched from Japan. With an aim of disseminating the cultivation and improving the productivity of upland rice, especially NERICA, the expert's activities included choosing appropriate varieties, selecting cultivation standards, disseminating cultivation techniques and improving systems for increasing seed yield.

NERICA is a hybrid of an Asian variety of rice, which has high yields but is vulnerable in dry conditions, and an African variety, which has excellent drought tolerance and disease resistance but has relatively low yields. It was developed by WARDA in 1994. Since NERICA is expected to produce high yields even if grown in upland rice conditions, there are hopes it will increase in popularity among African countries where lands suited to wet-rice cultivation are limited. With these features, NERICA is expected to help increase productivity in semi-arid areas. In addition, it shows promise as an alternative variety even in cases where climate change has resulted in scarce rainfall or where aridification has expanded and wet-rice cultivation has become difficult.

Furthermore, in addition to the cooperation projects described below for biomass, the following projects are regarded as being effective for mitigation.

• Technical Cooperation for Development Planning: Study of Prevention for Desertification in the South Region of Segou in the Republic of Mali (July 2004 to January 2008)

Development study aimed at (1) clarification of strategies for the wide-area expansion of projects for resident-led sustainable rural community development; and (2) human and institutional capacity-building of the National Directorate for Rural Development (DNAMR) within the Ministry of Agriculture, Animal Industry and Fisheries.

This study had two objectives: to clarify strategies for the wide-area expansion of projects for resident-led sustainable rural community development; and to build the human and institutional capacity of the National Directorate for Rural Development (DNAMR) within the Ministry of Agriculture, Animal Industry and Fisheries. As a consequence of the results of this study, it is expected that residents of the target area will take the lead in improving their own livelihoods and in managing natural resources, and this will help prevent actual desertification. While the prevention of desertification involves certain mitigation effects, such as through planting trees and reducing the number of trees felled for firewood, at the same time, the resident-led sustainable rural community development in this study is also expected to be effective as an adaptation strategy. In this study, various activities aimed at the formulation of an action plan have been conducted in pilot projects, such as livelihood and hygiene improvement, natural resources management, small-scale cultivation of vegetables to raise famer incomes, grain storage and the fattening of livestock. By acquiring the ability to conduct these activities independently, not only will residents develop surplus capacity to deal with external changes as a consequence of improvements in their local infrastructure, it is also expected that residents will be able to think of flexible responses themselves and put them into practice.

• Technical Cooperation for Development Planning: (Mauritania) Study on the Oasis Zone Development focused on Feminine Promotion (September 2005 to March 2008)

The objectives of this project were: (1) clarification of a gender-conscious regional development plan for improving livelihoods and alleviating poverty; (2) clarification of a plan for disseminating gender-conscious regional development to other oases, including small oases in remote locations; and (3) human and institutional capacity-building of the Secretary of State for the Condition of Women and other relevant organizations.

Improved cooking stoves introduced through this project reduce the use of firewood at homes. Promoting the efficient use of fuel at home will help to contain deforestation and consequently reduce excess greenhouse gas emissions.

(3) Issues in implementing projects

In terms of the specific effects of global warming on agriculture in developing countries, there are concerns that it will bring about an increase in vulnerability, such as: (1) a decrease in water supply, desiccation of soil, poor growth of crops, and an outbreak of pests because of drought and/or high temperatures; (2) erosion of soil, destruction of agricultural infrastructure (production and distribution infrastructure), poor growth of crops, and an outbreak of pests because of torrential rains and floods; and (3) a large

contraction or expansion of the land suitable for growing crops because of a change in the agricultural ecological environment. Therefore, in terms of measures to counter global warming, both adaptation strategies, such as in the field of water management and for cultivar development and pest control, and mitigation strategies, such as the reduction of greenhouse gases, will be necessary.

(4) Points for concern in extending cooperation

With respect to "adaptation strategies" and "mitigation strategies," although there are various activities as stated in (1) and (2) above, always proceed with the planning and implementation of a project based on the point of view that there might be something else to help climate change measures. When implementing mitigation strategies, a track record in measuring projects wherever possible should be built up, not only for loan aid and grant aid, but for technical cooperation projects as well, by adopting a co-benefit approach (promote projects that contribute to both "sustainable development" and "climate change") and by being aware of MRV⁴⁶ (ensure rigorous, robust and transparent mitigation of climate change, through a proper understanding of measurable, reportable and verifiable emission reductions).

With regard to mitigation strategies, such as reducing emissions of methane and nitrous gases or promoting absorption through the fixation of carbon dioxide in farmland soil, for the time being, carry out activities focused on JICA's research studies and verification tests actively conducted in cooperation with related organizations, while carefully observing the activities of the United States, the World Bank and other leading donors. It should be noted that Clean Development Mechanism (CDM)⁴⁷ projects are effective, not only in reducing greenhouse gases, but also in enhancing the developing country's ability to combat global warming such as through the introduction of advanced technology, and as such, also consider the applicability of CDM projects, including any applicable conditions such as the calculation of reductions and definite monitoring.

- 1-11-2 Response to global environmental issues (biomass)
- (1) Current state of JICA projects

Following are some of JICA's recent initiatives related to the use and application of bioenergy.

• Technical Cooperation Project: (Kyrgyz Republic) The Project for the Support for the Dissemination of Biogas Technologies (December 2007 to May 2011)

⁴⁶ Measurable, reportable, verifiable

⁴⁷ The Clean Development Mechanism (CDM) is part of the Kyoto Protocol, a framework for promoting the reduction of greenhouse gases (GHG) internationally. It is an initiative conducted jointly by a developing country and a developed country. Under the CDM, businesses in the developed country and developing country carry out a joint GHG reduction/absorption project in the developing country, after which they can acquire carbon credits of value, which are tradable on an emissions trading market, for the amount of additional GHG reductions/absorptions created through the project. Japan International Cooperation Agency (JICA) and Institute for International Cooperation (IFIC), *JICA's Assistance and the Clean Development Mechanism (CDM)*, Study Report (July 2006)

For the purpose of establishing a model extension system for disseminating biogas technologies to rural areas, this project has involved: (1) development of biogas technologies; (2) joint public-private development of human resources at the central and local government level for extending biogas technologies at the working level; (3) review of appropriate loan facilities for farmers for the purpose of disseminating biogas technologies; (4) establishment of a network between the central government, local governments and worksites for the dissemination of biogas technologies; and (5) publicity of biogas technologies within rural communities.

• Technical Cooperation Project: (Brazil) Social Inclusion through the Incentive to Produce Oleaginous Plants for the Generation of Bio-diesel in the State of Rio Grande do Norte (April 2009 to April 2013)

For the purpose of building a model bio-diesel fuel (BDF) production chain for small-scale farmers, this project involves: (1) formulation of a strategy aimed at establishing BDF production chains for small-scale farmers; (2) establishment of a sustainable farming system for small-scale farmers which includes oilseed crops; (3) establishment of a system for model farmers to distribute oilseeds and raw oil; and (4) formulation of an implementation plan to disseminate BDF production chains targeting small-scale farmers.

• Technical Cooperation Project (science and technology): (Viet Nam) Sustainable Integration of Local Agriculture and Biomass Industries (October 2009 to October 2014)

The objective of this project is to demonstrate the effectiveness of a system of "sustainable integration of local agriculture and biomass industries" in the Southern region of Viet Nam, centered on combining the production of bioethanol from unused biomass such as rice straw with the production of biogas from waste biomass such as the excrement from livestock.

(3) Issues in implementing projects

Given that it is a carbon-neutral source of energy, biomass energy is attracting attention as a measure to combat global warming. However, with regard to production resource group biomass,⁴⁸ there are concerns that competition with food as a consequence of any large-scale commercial use will bring about price increases and will have an impact on the supply and demand of food. Moreover, in order to increase production of biomass energy, the area of arable land for producing biomass resources would need to be expanded, and given this, there is potential for increased deforestation and other forms of environmental destruction. Suggestions have also been made that bioenergy can hardly be described as "carbon neutral" in view of the carbon footprint in its production and transportation process, and that given the limited users of the produced bioenergy, for instance, it is yet to become technologically established. On the other hand, unutilized resource group biomass⁴⁹ has also received attention somewhat because of

⁴⁸ Production resource group biomass is comprised of terrestrial resources (sugar cane, sugar beet, corn, rapeseed, etc.) and aquatic resources (seaweeds, microorganisms, etc.). (Omori, Ryota, et al. "Trend and Prospects of Bioenergy Utilization," *Science & Technology Trends*, December 2001 edition)

⁴⁹ Unutilized resource group biomass is comprised of agricultural resources (rice straw, rice husks, wheat straw, bagasse, vegetable scraps, etc.), livestock resources (livestock manure, butchery residues, etc.), forestry resources

the benefit to small farmers, such as the use of methane gas produced from livestock waste, as well as because of its sustainability and the fact that it would not be easily influenced by international markets and energy policies.

(4) Points for concern in extending cooperation

With regard to biomass energy, focus support in part on the introduction and construction of systems for the local consumption of locally produced energy as seen with biogases and so on. Furthermore, with respect to large-scale initiatives aimed at commercialization and sale as seen with bioethanol / biodiesel, provide support while also taking account of such factors as competition with food, burden on the environment and whether the cost is commensurate to the benefit.

- 1-11-3 Response to global environmental issues (conservation of biodiversity)
- (2) Current state of JICA projects
 - Seed Bank Project in the Union of Myanmar (Myanmar, 1997 to 2002)

Myanmar has many precious plant genetic resources, but as a result of the nurturing and spread of high yielding varieties in recent years, there has been a dramatic decrease in the cultivation of native varieties, and there are concerns that precious genetic resources might be lost. Under such circumstances, JICA provided support through grant aid and technical cooperation for the Seed Bank Project. The aim of this project is to collect, characterize, evaluate and preserve genetic resources, with a special focus on rice, and to effectively utilize these resources in plant breeding programs.

• Participatory Forest Management Project in Belete-Gera Phase I, II (Ethiopia, 2003 to 2012)

In Ethiopia, forests are becoming progressively smaller and degraded due to such factors as excessive deforestation and population growth, and this threatens the very foundations of people whose livelihoods rely on natural resources. Together with local residents, this project has set out to preserve forests and to improve the livelihoods of residents in the Belete-Gera Regional Forest Priority Area (RFPA) where precious forest ecosystems remain.

During the second phase of this project, efforts have been undertaken to extend the participatory forest management system, which was developed in the first phase, to the Belete-Gera RFPA. In particular, coffee that grows naturally in the forests of the Belete-Gera RFPA has been certified by the environmental NGO, Rainforest Alliance. This has meant that the coffee is able to be sold at a high price, thereby helping to improve the lives of local residents and to preserve the forests.

⁽forest-thinning waste, saw mill waste, construction waste, etc.), fishery resources (residues from fishery processing, etc.) and urban waste resources (household waste, sewage sludge, etc.). (Omori, Ryota, et al. "Trend and Prospects of Bioenergy Utilization," *Science & Technology Trends*, December 2001 edition)
- * This project is essentially an initiative for forest preservation. It has, however, been presented here because livelihood improvement through agricultural activities has been incorporated as an important component in the project for the purpose of providing an incentive to local residents.
- (3) Issues in implementing projects

"Promotion of biodiversity conservation and sustainable use" is positioned as one of the three priority sectors in JICA's cooperation for environmental conservation. The sustainable development of agriculture, fishery and forestry is at the core of JICA's initiatives in this area, and has been the focus of JICA's efforts for many years.

On the other hand, looking at the history of agricultural development, the traditional form of slash-and-burn agriculture was a sustainable system in which land would be repeatedly cultivated and then lie fallow on a fixed rotation to maintain soil fertility. However, the loss of balance caused by population growth and the development of large-scale plantations meant that, one after the other, forests were converted to farmland. Furthermore, amid initiatives focused on improving productivity, examples have been seen where diversity has diminished as traditional varieties are replaced with modern varieties, and also where excessive use of pesticides and chemical fertilizers has increased the impact on the surrounding environment or caused a financial strain on farmers.

(4) Points for concern in extending cooperation

As described above, depending on local conditions, improvement in productivity is not always consistent with conservation of biodiversity. Accordingly, maintaining the right balance between food security, livelihood improvement in rural areas and conservation of biodiversity is an important issue for the future. Introducing a local resource conservation-style of agriculture while ascertaining local conditions, providing incentives such as through organic certification, supporting the introduction of seed banks need to be included in considerations as elements of cooperation.

Development Objective 2: Stable Food Supply

Mid-Term Objective 2-1: Formulating food supply/demand policy

- (1) Summary of concept
 - 1) Scope of mid-term objective

Formulating food supply/demand policy is to determine the direction of agricultural development, to consider which crop should be the staple food of the people on the basis of their nutritional status and on supply-demand projections, and to prepare fundamental strategies for a stable supply of food at the national level, such as whether to aim for domestic self-sufficiency for the staple food or to substitute it with imports.⁵⁰

2) Specific details of cooperation activities

The following perspectives are important in formulating a food supply/demand policy.

- (i) Ascertain the present capacity and future potential of domestic agricultural production based on the planted acreage and production volume of each crop, natural conditions, irrigation and other agricultural infrastructure; compare this against the current nutritional status of the people; and examine from a perspective of ensuring national nutrition.
- (ii) Work out food supply and demand projections by comparing estimates for future population against volumes of agricultural production, and then formulate the food supply/demand policy while considering which crop to focus on in agricultural development.
- (iii) Clarify a strategy for stabilizing domestic food supply (circulation between regions, development of a stockpiling system).
- 3) Connection with other mid-term objectives

The food supply/demand policy is part of the agricultural policy formulated under Mid-Term Objective 1-1 "Capacity building for policy planning and implementation in the field of agricultural and rural development." It could also be described as being connected with all mid-term objectives because the direction of the country's agricultural development is determined.

(2) Current state of JICA projects

Examples of support for the collection and analysis of information and data necessary for the formulation of a food supply/demand policy include JICA's cooperation projects

⁵⁰ Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (definition internationally accepted at the World Food Summit 1996).

for improving systems for the collection of statistical information, such as a national census, and those for human resources development. It is also important to build systems for accurately and efficiently collecting information necessary for policy planning (how much of which crop is produced in which region), by developing statistics on food production and distribution in each region, and by establishing improved systems for communicating the information accurately and swiftly from regional areas to the central government. Support for building food supply-demand models is also possible for making food supply-demand projections.

As for policy planning, support for establishing a system to implement various components of the policy can be considered. This includes improving distribution and market-related laws, regulations and systems, including civil and commercial laws, executing agricultural pricing policy and upgrading food stockpile plans. Following are specific JICA projects.

• Technical Cooperation Project: (Laos) Capacity Building Project for Strengthening of Agricultural Statistics System (March 2007 to March 2010)

The objective of this technical cooperation project was to improve the agricultural statistics provided to the Department of Planning and Cooperation at the Ministry of Agriculture and Forestry from the provincial departments of agriculture and forestry, by improving strategies and techniques pertaining to agricultural statistics, enhancing the capacity of local government personnel for agricultural statistics, and establishing a system for the provision of agricultural statistics and data.

• Technical Cooperation for Development Planning: (Thailand) The Study on East Asia/ASEAN Rice Reserve System (April 2002 to November 2002)

The objective of this study was to review the management system for rice reserves in East Asia (ASEAN+3) and to enhance its functions.

• Loan Aid: (Indonesia) Development Policy Loans I to VI (L/A signing date: 2005 to 2010)

Under this agreement, the Indonesian government sets "policy actions" for: (1) improving the investment climate, such as enhancing investment regulations and import/export procedures; (2) improving fiscal management, such as formulating a national budget that fully reflects the country's development plans; and (3) poverty reduction, such as paying grants for community development projects for the improvement of rural roads, and is provided with loans on successful achievement of these actions (cofinancing with the World Bank and the Asian Development Bank).

• Training and Dialogue Program: Planning and Designing of Agricultural Statistics for Agricultural Policy Making (JICA Tsukuba, FY2010 to FY2012)

This training was conducted for the purpose of improving the planning and design capacity of governmental officers working in departments responsible for agricultural statistics or for agricultural policy and/or food supply-demand planning, and in recognition of the importance of agricultural policy and food supply-demand planning aimed at sustainable agricultural production, to summarize the basic matters necessary for making such plans.

(3) Issues in implementing projects

Many developing countries have failed to sufficiently grasp domestic food supply-demand conditions because of a lack of statistical information, and so even preparing the standard documents of a food supply/demand policy takes time. In some cases, even supposing the central government of a developing country draws up a food supply/demand policy, the policy cannot be executed because of a lack of the necessary plans and systems.

Furthermore, making projections for food supply and demand involves many factors, such as population, income levels, area of arable land, water resources, limits to productivity improvements and instability of markets, and there are many aspects which cannot be estimated because these factors are continually changing.

(4) Points for concern in extending cooperation

In many cases, dispatching individual experts as policy advisors is an efficient way of providing support for the formulation of food supply/demand policy. A method adopted in other cases is for JICA to make food supply-demand projections for the relevant country as part of the process of preparing a national master plan for agricultural development, and then for the country to use those projections as one of the bases for formulating its master plan.

As for support provided for the gathering of information necessary for developing food supply/demand policy, support for developing agricultural statistics and for improving statistical techniques is required.

Furthermore, world grain prices began showing signs of rising in about 2006 and peaked in 2008. This had a considerable impact on countries all over the world, but the impact of the shortage of food on developing countries was particularly serious. In some developing countries, the poor in particular were unable to obtain enough food, and in others, there were inevitable changes in government because of growing criticism of the ruling administration.

In terms of an emergency, short-term response to the tightening balance between the supply and demand of food, consideration can be given to providing food aid and providing support for increasing food production. As for medium-term and long-term responses, contributions need to be made for achieving food security through: (1) technical guidance on the proper use of fertilizers and pesticides, and initiatives for increasing productivity, such as the improvement and maintenance of irrigation and drainage facilities; (2) the improvement of distribution and selling systems, such as the development, maintenance and rehabilitation of infrastructure for transporting and distributing agricultural products, the introduction and strengthening of reserve systems, and the improvement of access to market information; and (3) capacity building for making agricultural policy, such as the improvement of governance and the development of agricultural statistics. Furthermore, in cases where the government of a developing country participates in free trade agreements, such as the World Trade Organization (WTO), and promotes free trade policies as a nation, agricultural products

of high quality can sometimes be imported inexpensively. This can be a disincentive for farmers, and needs to be taken into account when formulating food supply/demand policy.

Agricultural investment linked to raising production has become an important tool in carrying out agricultural development in developing countries, and has been increasing in popularity in recent years. Against this background, in August 2009, the Ministry of Foreign Affairs and the Ministry of Agriculture, Forestry and Fisheries put together the "Guidelines on Promoting International Investment for Food Security" in the hope of achieving stable food supply for Japan and for the world. Internationally as well, efforts are continuing for agreement on the Principles for Responsible Agricultural Investment (PRAI). Thus, it appears that the development of rules for overseas agricultural investment is set to be a major issue in the future.

Mid-Term Objective 2-2: Improving import systems

- (1) Summary of concept
 - 1) Scope of mid-term objective

In order to secure stable food supplies, develop import-related policies and systems that enable agricultural products to be imported in a manner consistent with domestic agricultural development, build warehouses for stockpiling food, develop the transportation infrastructure such as ports, roads and railways, and build domestic quarantine and inspection systems that conform to international standards.⁵¹

- 2) Specific details of cooperation activities
 - Improve import-related policies and systems that enable food to be imported in a manner consistent with domestic agricultural development, and develop import-related infrastructure. In addition, develop quarantine and infectious disease prevention systems for imported agricultural and livestock products.
 - In improving policies and systems, due consideration needs to be given to the advantages and disadvantages of producing food through importing.⁵²
 - For this reason, support for the improvement of import-related policies and systems could take the form of advice based on economic advantage and food security, or the training of personnel responsible for planning and executing policies and systems.
- 3) Connection with other mid-term objectives

In terms of developing import-related policies and systems that enable food to be imported in a manner consistent with domestic agricultural development, careful attention needs to be paid to Mid-Term Objective 1-1 "Capacity building for policy planning and implementation in the field of agricultural and rural development." Also, with respect to quarantine and infectious disease prevention systems for imported agricultural and livestock products and the development of related infrastructure, given that the implementing agency in the partner country is often the same as the intended agency under Mid-Term Objectives 2-2 "Improving the food distribution function" and 2-5 "Strengthening export promotion measures,"

⁵¹ If the standards governing systems for imported plant protection are different in each country, there is potential for the world's agricultural trading systems to become distorted. Therefore, the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) was developed as an international framework for import systems.

A purpose of the SPS Agreement is to define rules relating to the application of WTO provisions to prevent quarantine and hygiene measures from becoming an unreasonable impediment to international trade and to ensure they are not applied in a way that constitutes a disguised restriction. Another purpose is to harmonize each country's quarantine and hygiene measures based on international standards prepared by a relevant international organization.

⁵² Advantages include that, in some cases, imported foods can be supplied to consumers at a lower price than can be achieved through domestic production, and that food prices can be stabilized by striking a balance between imports and domestic production. On the other hand, disadvantages include that developing countries run the risk of being unable to import enough food when necessary since the volume of imports depends on shifting conditions in exporting conditions. This is especially true when a country depends on imports for most of its staple food.

consistency with this mid-term objective needs to be kept in mind when developing the human resources of the relevant agency.

(2) Current state of JICA projects

To date, JICA has extended cooperation in the improvement of import systems within the framework of "trade promotion." As for the development of quarantine and infectious disease prevention systems, it has helped improve testing and inspection facilities and equipment, and trained inspectors.

• JICA-ASEAN Regional Cooperation Meeting (JARCOM) Phytosanitary Regional Training Program (Cambodia, Laos, Myanmar, Viet Nam (CLMV region)), (February 2008 to January 2011)

As shown in the accession of Cambodia and Viet Nam to the WTO, integration of the CLMV region into the world economy has gained impetus, and amid expectations of increased activity in the intraregional distribution of goods as a consequence of the opening of the East-West Economic Corridor, capacity building and standardization of plant quarantine procedures has also become a key common issue from the perspective of promoting trade in agricultural products both within and outside the region. The aim of this program is to rectify disparities in phytosanitary capacity among the CLMV nations. By providing individual training in line with the needs of each CLMV nation, the program has sought to improve the skills and knowledge of plant quarantine officers in such areas as monitoring, risk analysis and diagnosis.

• Training and Dialogue Program: Thermal Treatment for the Disinfestation of Fruit Flies (JICA Okinawa, 2008 to 2010)

Training on technologies for treatment in quarantine, and on disinfestation testing using heat treatment and cold treatment

• Training and Dialogue Program: Assurance of Food Safety and Quality Control (JICA Hyogo, 2010 to 2012)

As one component of the training program, a lecture and field trip are organized regarding the inspection of imported foods.

(3) Issues in implementing projects

In countries where there is no clear import policies based on the development of domestic agriculture and consequently massive amounts of cheap food are being imported from agriculturally-advanced countries in ways that are harmful to the development of that domestic agriculture, importing food leads to an outflow of foreign currency which the country can ill afford to lose. Imports aimed at achieving stable food supplies also entail many disadvantages for developing countries too, impeding promotion of domestic industries, and leading to the use of precious foreign currency reserves. Once a country starts importing, it becomes difficult to slow down or stop because importing is institutionally simple and it generates vested interests. Developing countries should therefore be fully aware that imports could easily weaken their domestic industries.

Furthermore, in improving import systems, while there is a need to improve related infrastructure, such infrastructure involves considerable cost, not only for construction, but for management and maintenance too.

Imported plants and plant products subject to quarantine are extremely wide ranging, from plants for cultivation which could be carrying pests (seedlings, saplings, scions, bulbs, seeds, etc.), edible fruits and vegetables, decorative cut flowers and timber, to plants that have been dried, as well as non-plants such as living insects and microorganisms. For this reason, there also needs to be wide-ranging capacity building for inspectors.

Typically, a country will have bans on the import of pests which are difficult to detect at the time of inspection and whose albeit unlikely infestation would cause considerable damage. In addition to actual living pests, this also includes their primary host plants, as well as soil in which there is a high risk of large numbers of pests being concealed. However, in developing countries, due to their inadequate quarantine and infectious disease prevention systems, they are easily infested by such pests, which are also having a major impact on their domestic agriculture.

(4) Points for concern in extending cooperation

In developing countries and net importers of food, there needs to be a proper combination of domestic production, international trade, reserves and safety nets for the poor in accordance with the country's economic development and resource reserves. Moreover, when selecting which agricultural products to import, consideration needs to be given not only from a perspective of trade promotion, but also from a perspective of adequately protecting the domestic agriculture of the country targeted for cooperation.

In terms of the direction for cooperation, everything needs to be focused on "imports," from the improvement of import-related policies to the development of physical facilities and human resources. In particular, in order to import the required amount of food, infrastructure such as stockpiling facilities, ports, roads and railways needs to be developed, and so in this respect, consideration can be given to formulating relevant infrastructure development plans, as well as to utilizing financial aid in constructing, managing and maintaining that infrastructure.

Quarantine and disease control of imported agricultural and livestock products consists mostly of reviewing documents and carrying out tests and inspections. In conducting quarantine and disease control, simple and efficient procedures are necessary, not only to ensure safety, but also to protect the commercial value of the imported agricultural products. Consequently, it is also important to give advice on the improvement of quarantine and disease control systems, including on these procedures.

Agricultural and livestock products imported from other countries could contain pests or communicable animal diseases that do not exist in the importing country, or they could contain natural poisons that are hazardous to humans, or the associated standards could be different in the exporting and importing countries. Because of this, when importing a product, it needs to be tested and inspected for harmful or poisonous substances, additives and agricultural chemical residues based on the standards of the importing country or on those established by international organizations. Consequently, projects supporting the development of quarantine and infectious disease prevention systems also need to incorporate the development of testing and inspection facilities and equipment.

Mid-Term Objective 2-3: Proper use of food aid

- (1) Summary of concept
 - 1) Scope of mid-term objective

Distribute available food aid properly and fairly in cases where: (1) food cannot be secured because of a large-scale natural disaster such as drought or heavy rainfall; and (2) the poor are suffering from chronic food shortages. Since domestic agriculture in developing countries, especially those in Africa, is often unstable and since those countries cannot afford to purchase imported food, food aid is indispensable in enabling them to secure food supplies in the short term.

2) Specific details of cooperation activities

Japan provides aid as described in (2) below. The United Nations World Food Programme (WFP), a food aid agency, also has a number of specific-purpose programs, such as "Food for Life" (food supporting life: emergency aid), "Food for Growth" (food for promoting growth: economic-social development aid), and "Food for Work/Food for Training" (food for encouraging self-reliance: economic-social development aid). JICA coordinates with these programs at the project level and at the volunteer level.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-1 "Capacity building for policy planning and implementation in the field of agricultural and rural development," 1-4 "Promoting crop production (rice and other grain crops)," 1-5 "Promoting crop production (vegetables)" and 2-1 "Formulating food supply/demand policy"

(2) Current state of JICA projects (Japan's food aid)

Japan has been providing food aid (KR) since 1968 on the basis of a Food Aid Convention⁵³ contained in the International Grains Agreement signed in 1967 as part of the Kennedy Round (KR) trade negotiations of the General Agreement on Tariffs and Trade (GATT). Japan's food aid is granted in the form of funds for purchasing wheat, rice and other grain in response to requests from developing countries that are facing food shortages, and on the basis of an overall consideration of the seriousness of the food shortage, the foreign currency situation and Japan's relations with the recipient country.

The focus of KR is Africa, which receives more than 50 percent of the total budget for such aid. Recipient governments are required to put aside counterpart funds in local currency corresponding to the amount of food that has been procured, and these funds are used for projects that contribute to economic and social development in the recipient country, including agricultural development.

(3) Issues in implementing projects

⁵³ Japan is required to provide a minimum of 300,000 tons (wheat equivalent) per year.

Food aid is an effective means for reliably ensuring food supply, but in extending this type of aid, it is necessary to keep the following points in mind. First, an appropriate amount of food needs to be provided at an appropriate time after first thoroughly examining the need of such aid, or lack thereof, its timing and impact on domestic markets and domestic industries.

In the event an excessive amount of food aid is provided, or in the event it misses the period between harvests and is released to coincide with the shipment of domestically produced food, any influx of agricultural products attributable to the aid could send market prices tumbling and could hurt the domestic agricultural industry. In addition, continuous and extended food aid could end up impairing the development of domestic agriculture.

Second, any food provided by way of food aid needs to be distributed appropriately. Especially in cases where food aid is provided for the purpose of giving relief to the poor, simply releasing food onto the market may mean that it does not reach most of the people who are in real need of it.

(4) Points for concern in extending cooperation

In this area of cooperation, it is important to form projects and programs capable of achieving mutually complementary effects of development, such as by utilizing Japan's food aid and by linking up with the United Nations World Food Programme (WFP) which provides some of the funds for food aid. At present, in Africa, JICA cooperates at the program or project level, such as with the WFP's Food for Work / Food for Training program (Zambia: Participatory Village Development in Isolated Areas (PaViDIA), Sudan: Project for Improvement of Basic Skills and Vocational Training in Southern Sudan (SAVOT), etc.), and at the volunteer level (Japan Overseas Cooperation Volunteers).

In 2009, the WFP launched a new program called "Purchase for Production" (PFP), in which a country's surplus crops are purchased at market prices to be distributed to internally displaced persons, thereby avoiding the negative impact on domestic producers caused by importing food aid, and in which standards of quality are established in an attempt to increase the competitiveness of domestically produced food. Given that this PFP program follows a somewhat similar course of action as the support provided by JICA to small-scale farmers for improving their efficiency and quality of production, going forward, attempts will be made to possibly link both forms of cooperation in the field.

As a consequence of the substantial rise in food prices in recent years, the threat of famine and poverty has increased in many developing countries, as too has social unrest. Furthermore, with the occurrence of conflicts, natural disasters and financial/economic crises, the need for food aid remains high. Hence, multifaceted measures are also needed, such as for ensuring social safety nets and improving the balance between supply and demand by means of nutritional improvement and increased food production.

Development Objective 3: Promoting Dynamic Rural Communities Mid-Term Objective 3-1: Promoting rural areas in response to decentralization

(1) Summary of concept

1) Scope of mid-term objective

Through the devolution of administrative functions and financial resources to local governments, effectively utilize funds according to the characteristics of the regional area and the needs of the local residents, and strengthen the associated local government services, thereby promoting dynamic rural communities.

2) Specific details of cooperation activities

Developing countries have been pushing ahead with various different forms of decentralization. Depending on the region, some have devolved authority and financial resources, whereas others have posted central government personnel as administrative officers at local governments. In the field of agricultural and rural development, it is important to promote rural areas in a way to suit the local agro-ecosystem. For this reason, have opportunities for direct contact with residents in rural areas and build the capacity of local governments which can readily access information on local resources. Specific examples include participatory water management, participatory rural development, and the rebuilding of systems for extension services suited to decentralization.

3) Connection with other mid-term objectives

In implementing agricultural and rural development suited to a region, the capacity building of local governments is particularly closely connected to Mid-Term Objectives 3-7 "Participatory rural development" and 1-9 "Promoting agricultural extension."

(2) Current state of JICA projects

• Loan Aid: (Philippines) Agrarian Reform Infrastructure Support Project (Phase III) (L/A signing date: December 18, 2007)⁵⁴

In 1987, for the purpose of reducing poverty, the Philippine government selected communities where land allotment had progressed to some extent as a result of agrarian reform, designated them as Agrarian Reform Communities (ARCs), and undertook a project for supporting each ARC in rural infrastructure improvement.

However, severe fiscal circumstances meant that it could not provide agricultural support once the agricultural land had been allotted. JICA launched a project to support the ARCs in each region, and designated two priority areas for support: the development of agricultural infrastructure, such as irrigation facilities, rural roads, simple water supply facilities; and the strengthening of farmers' organizations, such as agricultural cooperatives and irrigation associations. A feature of this project is that there was smooth cooperation between the Department of Agrarian Reform, the National Irrigation Administration and local governments. The standard of living in the target ARCs improved

⁵⁴ JICA's World 2009, September Edition (http://www.jica.go.jp/publication/j-world/0909/index.html)

considerably, and the World Bank and the Asian Development Bank (ADB) also began to support the ARC development policy. ARC development is still being rolled out across the nation.

• Technical Cooperation Project: (Tanzania) Formulation and Training of the DADP Guidelines on Irrigation Scheme Development (February 2007 to January 2010)

Irrigation development projects in Tanzania used to come under the jurisdiction of the central Ministry of Agriculture, Food Security and Cooperatives (MAFC), the Division of Irrigation Technical Services (DITS) and Zonal Irrigation and Technical Service Units (ZITSUs, regional offices of the DITS, 7 locations nationwide). However, under the Agricultural Sector Development Program (ASDP), which was formulated in 2002, small-scale irrigation projects (of 500 hectares or less), such as water harvesting and the improvement of existing irrigation facilities, were to be implemented by districts in accordance with District Agricultural Development Plans (DADP) formulated by each district based on the ASDP. Nevertheless, district irrigation technicians lacked adequate experience and skills, and because no general guidelines on irrigation projects had been developed for the technicians to consult, it was difficult for the districts to plan and implement efficient irrigation projects.

The aim of this project was to improve the quality of irrigation projects in line with the division of roles between the central government and districts under a decentralization of power, thereby improving the agricultural productivity of small farmers. This was to be achieved by enhancing the suite of business abilities of district irrigation technicians, relating to the formulation, implementation and operational management of irrigation projects.

Technical Cooperation Project: (Tanzania) Technical Cooperation in Strengthening the Backstopping Capacities for the DADP Planning and Implementation (March 2009 to March 2012)
 In Tanzania, the Agricultural Sector Development Program (ASDP) is implemented inclusive of basket funds from donors. Having promoted decentralization, development budgets in Tanzania are executed at the district level, and 75 percent of the ASDP budget is distributed to the District Agricultural Development Plans (DADPs) formulated by each district. Nevertheless, the capacity of each district is low, and as a result, it has become clear that DADPs are not being implemented effectively. Consequently, the aim of this project was to strengthen the system of support for formulating and monitoring DADPs.

(3) Issues in implementing projects

Decentralization: (1) allowed for detailed, efficient and effective services that take needs and local resources into account because local governments are close to residents; and (2) enabled administration to be executed which was suited to local characteristics, and promised such effects as making resident participation easy and raising the eagerness for participatory development. However, the effects of decentralization on rural development have given rise to the issues shown below. They demonstrate that guidance by the central government and its substantial support for regional areas is still important for advancing decentralization.

1) Devolution of authority without financial backing

Many cases can be seen of local governments which lack financial resources and which do not receive adequate grants from the central government. Regardless of whether financial resources have been devolved, there are also many cases where they are not allocated reasonably because the head of the local government gives a low priority to agriculture. Furthermore, as a result of tax revenue being devolved to local governments, a disparity emerges between urban and rural areas, and despite the strong potential for rural areas, there is not enough investment here. As a result, even if a project leads to an appropriate transfer of technology, instances can be seen where a budget for expanding the technology to a wider area is not guaranteed.

2) Hasty devolution of authority amid local governments being not yet fully capable

In the past, it was presumed that, when transferring services previously provided through central government organizations, the recipient local governments would be equipped with the capacity to conduct these services. However, in many developing countries, power has been progressively decentralized without due consideration to this point.

As a result, various problems have arisen, for instance: a disparity in standards for establishing extension workers and the content of the services they provide depending on the fiscal strength of the local government; an increase in the amount of work undertaken by extension workers, such as having them take charge of all business related to general agricultural administration; and the abolishment of the organization coordinating research and dissemination at the central government, and a rapid deterioration in the efficiency of dissemination because of research results becoming difficult to circulate.⁵⁵

- (4) Points for concern in extending cooperation
 - 1) Capacity building of local governments and cooperation of central governments

The central organization in charge of agricultural and rural development needs to evaluate the formulation of agricultural and rural development policies mindful of decentralization, as well as research and development functions, finances, philosophies on the pool of human resources and other resources, and the prior capacity of the envisaged local government counterpart agencies, such as eagerness and ability. In addition, support the building of personal networks for local government personnel who lack experience for formulating and implementing plans through participatory techniques.

- 2) Securing continual funding
- Use development policy loans to support policy improvements and general system reforms in which decentralization is consistent with employment and income increases in rural areas, in order to realize development planning in line with actual local circumstances and the provision of attentive services by local government agencies for this purpose.
- The basic idea is to create visible outputs during the project period, and make approaches so that central and local governments allocate their own financial resources.

⁵⁵ Murakami, Atsushi, Agriculture Extension Research 9 (1) 74-80, 2004-06-18, Agricultural Extension Research Society of Japan

- Given that the new JICA is able to take advantage of three schemes, aim to secure continual funding by switching between the schemes depending on the nature of the project. For example, in the case of a yen loan, there is support for large projects like for the Agrarian Reform Infrastructure Support Project in the Philippines, and another possibility is a two-step loan specific for agricultural and rural development. In the case of grant aid, by applying counterpart funds based on Grant Aid for Underprivileged Farmers to JICA's technical cooperation, and by engaging in careful discussion on the use of those funds, aim to secure continual funding for the wide-area expansion of small-scale projects.
- In countries where progress has been made in aid coordination and where basket fund schemes and general budget support have become mainstream, aim to secure continual funding by making a point that Japan's projects are allocated budgets from the basket funds while bearing in mind the recipient government's Medium Term Expenditure Framework (MTEF).⁵⁶
- Grant Aid for Poverty Reduction Strategies: Established in 2007 with an aim of expanding the efficacy of aid by using the grant aid to provide fiscal-support-type assistance to complement technical cooperation projects and so on, while maintaining past technical cooperation projects as the main modalities of assistance.
- 3) Support measures conscious of Agricultural Ecological Zones (AEZs)

Although not necessarily consistent with the flow of decentralization, in places like Central and South America, attempts are being made to promote efficiencies of agricultural policies by adopting a territorial approach of providing integrated agricultural support for each Agricultural Ecological Zone which reaches beyond single administrative units.

⁵⁶ Medium Term Expenditure Framework: An expenditure plan of three years to five years, prepared by the governments of developing countries. Developing countries are required to prepare MTEFs as a medium-term fiscal and financing plan based on the Poverty Reduction Strategy Paper (PRSP).

Mid-Term Objective 3-2: Improving the distribution and sale of food

(1) Summary of concept

1) Scope of mid-term objective

Aim for livelihood improvement and food security in rural areas through the development of infrastructure, building of institutions and transfer of technology leading up to the post-harvest processing, treatment, distribution and sale of agricultural products.

2) Specific details of cooperation activities

Possible activities include: (1) the upgrade of distribution market facilities and roads linking different markets, for the purpose of distributing agricultural and livestock products from food-producing regions to consumers smoothly and efficiently; (2) the establishment of implementation systems for appropriately and sustainably maintaining and managing the distribution market facilities and equipment thus established; (3) the development of stockpiling systems for providing stable food supplies to areas with a seasonal supply-demand imbalance and to those where the volume of agricultural product supply dwindles noticeably in years of drought or high rainfall; (4) increasing profitability through various technology improvements in the steps of production, collection, shipment, processing, distribution and organization; and (5) improving efficiency in the distribution of agricultural products by providing market information through the use of computers, mobile phones and other forms of IT.

3) Connection with other mid-term objectives

The development of markets and upgrade of roads linking different markets is connected to Mid-Term Objective 1-2 "Improving, maintaining and managing production infrastructure." It also has connections with Mid-Term Objective 2-1 "Formulating food self-sufficiency policy" from the perspective of food supply/demand, and with Mid-Term Objective 2-3 "Improving import systems" from its relationship with quarantine and infectious disease prevention systems for imported agricultural and livestock products and with the development of associated infrastructure.

(2) Current state of JICA projects

- Technical Cooperation Project: (Indonesia) Project on Strengthening Sulawesi Rural Community Development to Support Poverty Alleviation Programmes (March 2004 to June 2006) The Central Research Institute of the Indonesian News Agency conducted a project utilizing systems that use existing telephone lines to provide villagers with information they require. As part of this project, the activity was adopted by a model village, and consulting services and information on the marketing situation of agricultural products and market prices were provided.
- Technical Cooperation Project: (Kenya) Smallholder Horticulture Empowerment Project (September 2006 to November 2009)

In order to raise the incomes of small farmers in Kenya, simple infrastructure development is needed to strengthen coordination with domestic markets and improve production and distribution in rural areas. Therefore, at the core of this project is support for activities related to the "promotion of marketing," "management of produced and harvested crops" and "development of production infrastructure and distribution infrastructure" that are focused on smallholder horticulture farmer groups.

Grant Aid: (Nicaragua) The Project for Complementation and Amplification of Construction Equipment for the Rehabilitation and Maintenance of the Rural Roads (E/N August 2004)
 Most rural roads in Nicaragua are unpaved. Therefore, market access for agricultural and livestock products is difficult, and, without being able to tap the potential of agriculture and stock raising, the means for the rural poor to earn an income was restricted.

Furthermore, although there were calls for the improvement of rural roads from all parts of the country, there was a shortage of machinery and equipment used in the construction of rural roads, and so the demand for the improvement of rural roads could not be met. For the purpose of strengthening Nicaragua's capacity to improve rural roads, thereby improving market access for agricultural products and improving the access for local residents to social services, the Japanese government provided funding for the purchase of machinery and equipment for the construction of rural roads, including bulldozers, wheel loaders, motorized graders, hydraulic shovels, dump trucks and truck cranes.

• Grass-roots Technical Cooperation (partnership type): (Bangladesh) Income Generation Project for Farmers at the BOP by Using ICT (June 2010 to May 2013) (implementing agency: Kyushu University)

Telecenters are used as general information centers in rural areas. One of their aims is to successfully raise the incomes of farmers, by creating a situation using information and communication technology (ICT) where farmers can access agricultural information as needed, and where they can learn appropriate agricultural production technology: (1) Farmers acquire appropriate agricultural information at telecenters; (2) Build an agricultural information system designed to be user-friendly for farmers at the lower level of BOP; (3) Promote the participation of women in the cultivation of cash crops through the formation of women's groups.

(3) Issues in implementing projects

Generally speaking, developing countries do not have institutionalized distribution systems like the conventional Japanese system (producers \rightarrow agricultural cooperatives \rightarrow central wholesale market \rightarrow retailers \rightarrow consumers), and even if they do, most often it does not function efficiently. The shortage of market information (prices, high-demand varieties, sales networks, etc.) for farmers due to an undeveloped communications infrastructure is also a factor stymicing the distribution of food.⁵⁷

In the case of subsistence production levels, since the volume of agricultural and livestock products released onto the market makes up only a small portion of total production, it is difficult to develop a market where the principles of competition work. Given that distribution systems are systems for

⁵⁷ Ose, Yasuko (2002), Global Link Management Inc., *Potential for IT in the Distribution of Agricultural Products*, Journal of JBIC Institute, No. 13, December 2002, former Japan Bank for International Cooperation

accommodating self-sufficiency domestically, there is a high probability that any increase in production of agricultural products will result in a fall in market prices, and so for farmers, increased production does not lead to greater income, and conversely, negative incentives may come into play.

On the topic of stockpiling reserves, in cases where stockpiling is promoted primarily by government, food can be supplied swiftly and reliably to regions or in seasons where there is a shortage of food. On the flip side, developing and maintaining stockpile warehouses and purchasing food incurs a tremendous cost.

In cases where stockpiling is promoted primarily by the private sector, investment by government can be kept low, but because the government involvement in the distribution of food will inevitably be indirect, there is a risk that this approach will lack certainty. For instance, there is a possibility that private businesses may begin to act speculatively.

Furthermore, when it comes to the distribution and selling process, there are various issues to be tackled at each stage, namely harvesting, collection, sorting, distribution, packaging and selling, and unless efforts for these can be linked as a single series, the expected outputs will not be able to be obtained.

Moreover, during the course of transitioning from subsistence agriculture to a sophisticated system of distribution and sale, the issues and corresponding measures will be different for each of the stages listed above. Therefore, if the stage of commercialization development is misread, the proper effects will not be become apparent.

(4) Points for concern in extending cooperation

In considering the details of cooperation to be provided for the distribution of agricultural products, while the role of the private sector is extremely important, since the roles performed by government and the private sector vary depending on the stage of agricultural and commercialization development, the most important point to remember when formulating a project is to properly evaluate the stages of development for commercialization (see "Stages of agricultural development and support for commercialization" below).

In regions like Southeast Asia, as middle-income countries and medium-developed countries experience economic growth, it is expected that they will become progressively more commercialized and that the role of the private sector will grow. Therefore, in these regions, possible forms of support, in cooperation with the private sector, will also include reviewing policies, encouraging action by unions and other organizations and building technological capacity for the purpose of raising the connection between markets and farmer productivity and promoting the development of trade and markets. At the same time, even at these stages of development, it is also conceivable that governments will play an important role in some respects, such as in the development of modern markets and the introduction of more highly transparent trading systems, as well as in setting standards for quality classifications to support the sale of high-value-added products. For this reason, the series of processes from the production to consumption of agricultural products needs to be analyzed well, after which, consideration needs to be given to the roles of the government, the private sector and producers.

JICA has little experience in implementing projects in situations where the distribution stage has already

developed to some extent, and so the matters to keep in mind when providing support for improving the distribution of agricultural products in these situations are summarized in the column "Value Chain Approach as a Measure for Small Farmers and Poor Farmers"⁵⁸ with reference to materials produced by the FAO.

As for systems for distributing agricultural products, the figure below describes details of each in order to consider the necessity of establishing systems for each stage of production, transportation and storage, and consumption.

Project activities in relation to "distribution systems in areas of production" include, for instance, the development of feeder roads (same for "logistics systems"), the development of collection points and storehouses, and the formation of shipping cooperatives. Possible examples in relation to "trading systems" include the development of price survey systems and the development of agricultural statistics. (The items contained in parentheses in the figure below could also be the subject of cooperation.) When providing cooperation in the areas above mentioned, consideration needs to be given to the plan details, paying particular care also to (1) traditional practices, and (2) the trends of multinational corporations, etc.^{59, 60}

Furthermore, in order to manage markets efficiently, it is essential that the capacity of market participants be enhanced and that market information systems be improved. Cooperation for this area also needs to be strengthened in the future. With respect to enhancing the capacity of market participants, this should be considered in conjunction with promoting the formation of marketing cooperatives and with organizing farmers. Moreover, with respect to the development of IT-based market information systems for agricultural logistics, for countries where IT is still not very popular, hardware will need to be simplified.

⁵⁸ "Value chain" refers to all activities that are needed to link a product from its place of production to its final consumption (planning, production, distribution, selling and support for each of these processes).

⁵⁹ Other relevant parties include local private businesses, agricultural cooperatives and quasi-state enterprises.

⁶⁰ In some countries, distribution organizations are formed by different ethnic groups for each product and for each distribution route. Therefore, unless due care is given in this regard, there is a risk that any development of distribution organizations could also cause unnecessary social tension or ethnic conflict.



Source: JICA (1995) p. 5



	Stage of development		Subsistence production —		Post-subsistence		· Commercial production
re	(1) Production	~	Improvement of	~	Improvement of irrigation and agricultural land	~	Role of government
	infrastructure		irrigation and	~	Protected cultivation		diminishes
			agricultural land	✓	Agricultural machinery		
ictui	(2) Post-harvest	\checkmark	Storage and stockpiling	\checkmark	Facilities for post-harvest preparation and processing	✓	Post-harvest processing and
astru	processing		facilities, primarily for	\checkmark	Storage and stockpiling facilities (mostly for grain)		sorting facilities (including
ort for infra			grain				for vegetables and fruit)
						\checkmark	Wholesale markets
						✓	Packaging facilities
ddng	(3) Distribution	\checkmark	Trunk roads	\checkmark	Trunk roads	\checkmark	Rural roads
•1	infrastructure			\checkmark	Rural roads	\checkmark	Sophistication of packaging
							and means of transportation
						\checkmark	Cold chain
	(4) Selection of	\checkmark	Primarily grain; Aim is	\checkmark	Dissemination of superior grain varieties	✓	Selection of products which
	items to be		for the development and	\checkmark	Technological support related to expanding available		make good use of their
nts	introduced		dissemination of		items, with an aim of diversification (selection of land		advantageous origin (natural
one			high-yield varieties.		suited to cultivating each variety and subspecies,		conditions, social
pport for soft comp					establishment of cultivation systems, etc.)		conditions), promotion of
							dissemination
						✓	Use of price information
	(5) Formation of	\checkmark	The need for	\checkmark	For grains with a relatively developed distribution	\checkmark	Organization is important for
	production		organization is kept		system, there is potential for quality improvement		improving quality and
Su	organizations		limited, such as for		through organization. The need for organization for		strengthening
			water management.		other products is low.		competitiveness for all
							products.

Table 2-6 Stages of agricultural development and support for commercialization

Stage of development		Subsistence production —		Post-subsistence		Commercial production
(6) Establishment and standardization of production technology	*	Development and dissemination of technology that is of low cost and simple for farmers (irrigation, introduction of superior varieties, etc.)	✓ ✓	For grains and other products likely to sell well, it is also possible to introduce technologies requiring a certain level of investment (fertilizing, pest control, post-harvest processing, etc.) For other products whose introduction has been delayed, it is important to first map out lands suitable for cultivation and to establish cultivation guidelines, etc.	✓	Sales strategy (low-price or high value-adding) needs to be determined before introducing corresponding technology.
(7) Finding and securing markets	✓	Not especially considered.	✓ ✓	First, work to expand and stabilize markets in cooperation with distributors. (Producers guarantee the quality and quantity required by distributors, and distributors provide the market.) At a stage when distribution systems have not yet developed and the purchasing power of consumers is not all that high, an idea is to aim for a market with a limited focus on wealthy classes, etc., such as through franchise selling.	✓ ✓	Examine the products, destinations and timing of shipments based on market information Aim to enhance competitiveness through organizing farmers

	Stage of development	Subsistence production —	Post-subsistence		 Commercial production
Support for institution-building	(8) Establishment of quality standards, etc.	✓ Not necessary	 Initially target products with strong demand (primarily grains) For products that target a niche market, work to establish voluntary standards through producer and grower organizations 	✓ ✓ ✓	Quality standards based on appearance and size Organic certification GAP, etc.
	(9) Development of distribution systems	✓ Not necessary			

Value Chain Approach as a Measure for Small Farmers and Poor Farmers

(FAO: Donor approaches to supporting pro-poor value chains)

- 1. Amid advancing globalization the world over, rural areas in all developing countries are confronted with adversity and opportunity, and taking an appropriate response is a pressing issue. A balanced approach needs to be taken which also takes enhancing competitiveness and guaranteeing fairness into account.
- 2. Modalities of distribution in developing countries first begin changing around enterprises that deal in export products, and as value chains modernize, similar trends begin to be seen in the domestic market as well.
- 3. Various impacts can be expected as a result of rural areas in developing countries getting incorporated into the distribution networks formed under the initiative of exporters in developed countries (or major distributors in developing countries). It is generally said that the negative aspects are greater, but assessments need to be made by taking a careful look at the actual conditions which vary among different countries and regions.

Area	Expected impact	Assessment
Direct employment in retailing	Small stores get sifted out as distribution is rationalized, and employment decreases.	-
Indirect employment in the distribution industry	As above.	-
Employment effect on businesses	As above.	-
Wage levels of employees	Wage levels increase as productivity improves.	+
Income levels of distributors	Prices of raw materials are decreased and intermediate margins are cut as a result of the oligopolistic effects of major distributors. Wage levels at some distributors increase due to an increase in the volume traded and improved productivity.	+ / -
Income disparity	Disparity widens due to concentration and selection of distributors and retailers.	-
Income stability for distributors	Income becomes more stable for surviving distributors.	+
Capacity building	In new areas, such as quality/logistics control and franchise systems, there are instances of upskilling, but there are also instances of downskilling as a consequence of the division of labor.	+ / -
Labor standards	Becoming standardized, but at the same time, there is increasing pressure by major businesses for improvements in productivity.	+ / -
Greater opportunities for women	Although distribution patterns vary for different products, small-scale manual tasks, which have traditionally been undertaken by women, are tending to be cut.	- (?)

* Socio-economic impacts expected during transition from a traditional form of distribution to a supermarket-type distribution system

Area	Expected impact	Assessment
Environmental standards	Capacity to address environment improves along the entire value chain.	+
Competitiveness of domestic distribution industry	Improves.	+
Trade balance	Excess of imports expected if local economy cannot compete against the economies of scale of international distribution networks.	-
Consumer prices	Lower prices due to cuts to intermediate margins and improved productivity.	+

- 4. General policy options for improving value chains in developing countries
 - (i) Review of policies to facilitate business activity, such as easing complex and excessive regulations and protecting intellectual property rights
 - (ii) Reform of trade and investment policies
 - \checkmark Tax breaks and the easing of trade barriers, etc. to promote overseas investment
 - ✓ Export support programs, such as through better market information or loan facilities
 - ✓ Careful consideration of the procedure and timing aimed at strengthening competitiveness, by determining the balance between damage to domestic industries from an excess of imports against the loss of growth opportunities due to overprotection
 - (iii) Review of tax system
 - ✓ Support for modernization of the industrial structure, by introducing a consumption tax and shifting away from a structure largely reliant on income tax

[In general, the collection rate of income tax from large enterprises is high, whereas small enterprises are often omitted from collection. Income tax also acts to suppress business outsourcing (division of work, specialization).]

- 5. Policy options for building value chains that benefit small farmers in developing countries
 - (i) <u>Awareness raising and market matching</u>
 - ✓ In addition to providing information on market needs (products, quality, quantity, timing and price) to small-scale farmers in poor areas who lack information and knowledge, support programs that match farmers with distributors.
 - (ii) <u>Support for spreading the positive outcomes generated by major distributors modernizing</u> <u>distribution</u>
 - ✓ Value chains in a region can be modernized by the entry of major distributors primarily oriented toward exports. Provide support for a ripple effect, with these outcomes being shared with other distributors, etc.
 - (iii) Improvement of loan facilities (capital investment, working capital)
 - ✓ Enhancement of subsidy systems and loan facilities specific for capital investment
 - ✓ Debt factoring: In cases where recovering the proceeds from a sale takes a long time, this is purchased by a public institution for cash, and the state becomes responsible for recovering the proceeds.
 - ✓ Warehouse receipts: Short-term loans secured by commodities

- (iv) Enhancement of standards and certification systems
 - ✓ Promote sales to developed countries in particular, by providing support for the development and operation of standards on quality and safety, and also by providing support for the development of standards and certification systems that take into account support for small-scale farmers, environmental considerations and working conditions.
- (v) Support for the expansion of franchise systems
 - ✓ By operating as a franchisee of a major distributor, small and medium-sized operators in rural areas can expect to achieve a wider sales network and a higher technological standard. Conversely, however, there is also the possibility of a problem to do with the sharing of profits with the larger distributor that has stronger bargaining power. While being mindful of this point, supporting franchises can be effective.
- 6. Issues and matters to keep in mind when introducing value chains
 - ✓ Value chains are influenced by a wide range of factors, and organizing and generalizing these entails difficulty.
 - ✓ Many relevant people are involved in a value chain, and depending on their relative power, a value chain might end up generating socially undesirable results. There are no established methods for monitoring and evaluating these effectively and for guiding value chains in an appropriate direction.
 - ✓ Some of the main factors that influence value chains are difficult to monitor and/or control (market needs, profit sharing, barriers to entry, etc.)
 - ✓ Expansion of value chains leads to international competition, and producers and producing areas that are unable to attain more efficiency or lower costs will inevitably lose out to the competition. How do you mitigate the impact that this has on employment and income?
 - ✓ There are concerns that the many quality standards, for which efforts are being increasingly undertaken, will increase the management and distribution costs and decrease competitiveness in developing countries.
 - ✓ The approaches adopted by many donors are oriented toward exports targeting developed countries. This begs the question of what to do with those products that do not meet the standards for export. Could these possibly be absorbed by strengthening the value chains in the domestic market?

Mid-Term Objective 3-3: Promoting the agricultural processing industry

(1) Summary of concept

1) Scope of mid-term objective

By properly processing and storing agricultural products, it is possible to secure a food supply all year round and to increase the added value agricultural products. This not only reduces the gap in farmers' income opportunities between the busy and slack seasons, but also creates new markets for agricultural products and contributes to raising farmers' incomes.

2) Specific details of cooperation activities

The main content of cooperation is improvement of processing technology for farmers, improvement of the quality of processed goods, and development of processing plants and factories. Contributing to the promotion of villages like the "One Village One Product" movement by adding value to processed goods to form local specialties is also conceivable.

3) Connection with other mid-term objectives

This objective may be connected to Mid-Term Objectives 2-2 "Development of food distribution," 3-2 "Improving non-farming income" and 1-7 "Agricultural financing."

(2) Current state of JICA projects

- Technical Cooperation Project: (Thailand) The Project on Community Leader Development in Agricultural Cooperatives in Thailand (March 2007 to February 2011)
 In Thailand, members of households that belong to cooperatives have independently formed women's groups, youth groups and producer groups, and these carry out "One Tambon One Product" (OTOP) activities such as handicrafts and processed foods by utilizing their indigenous knowledge, wisdom and resources. The revenue earned through these activities helps to improve their standard of living. With an aim of further improvements, cooperation is provided for improving the quality of the agro-industry and strengthening its organization through the development of group leaders.
- Technical Cooperation for Development Planning: (Timor-Leste) Project for Promotion of Agribusiness in Timor-Leste (April 2009 to November 2011)
 In order to promote the processing and distribution of agricultural products by small-scale farmers' organizations, entrepreneurs and agro-dealers (brokers and distributors), formulate a master plan for developing administrative systems that support the processing and distribution of agricultural products, for enhancing the services provided by administrations to farmers' organizations and private businesses, and for improving infrastructure such as distribution-related systems and standards as well as road infrastructure. A project for improving the value chain for soybeans and a project for diversifying the consumption of domestically grown corn—such as extending the method for manufacturing bread made using domestically produced corn flour—have been introduced into some verification studies.

- Loan Aid: (Myanmar) Sugar Mill Project (Loan aid (L/A) signing date: December 28, 1982) With an aim of supplying sugar to the domestic market, a sugar mill was constructed to produce sugar from cane grown around Yedashe in the former district of Pegu in central Myanmar. The project was to satisfy national demand by increasing the production of sugar, the import of which had been prohibited due to a shortage of foreign currency. In good years, production accounts for about 20 percent of the national total, and this increased production is thought to have contributed to an increase in national sugar consumption (from 1.5 kg/person in 1990 to 3.8 kg/person in 2000).
- Grass-roots Technical Cooperation (partnership type): (Ethiopia) Enhancing self-sustainability of women agro-processing cooperatives in rural Ethiopia (October 2010 to September 2013) In rural areas in Ethiopia, small-scale farmers support their livelihoods through self-sufficiency and small amounts of cash earned by selling surplus produce. Poor living conditions and chronic undernourishment are two of the problems they experience. Amid these circumstances, there are limited income creation opportunities for women. In cooperation with the Ministry of Agriculture and Rural Development (MOARD) and the Federal Cooperative Agency (FCA), support was provided for the organization of seven mostly female agro-processing cooperatives and for the production and sale of value-added goods making use of existing agro-processing technologies. The seven cooperatives have been successful in raising incomes, and two new cooperatives have requested to commence processing and sales businesses. However, the seven cooperatives have been operated reliant on "livelihood improvement extension workers" from the Bureau of Agriculture and Rural Development (BoARD) and on support from the FCA. As such, the organizational capacity of the cooperatives required as a basis for maintaining and developing outputs is extremely weak. Support is being provided for comprehensive capacity building, including for the two new cooperatives, so that these cooperatives can be operated independently in order for their members to realize better quality of life through increased incomes.

(3) Issues in implementing projects

The key to stabilizing farm management and achieving job creation is not only technology for processing agricultural products, but also knowledge about quality control and the strengthening of production groups (clarification of authority and responsibility, division of roles).

Another point is that, generally, private sector activity comes first in the processing and distribution of agricultural products, and although there are appeals for administrative support and coordination for this activity, in many poor countries, private sector activity is underdeveloped. This means that even if the administration supports farmers, it may not result in any sustainable activity. Consideration also needs to be given to cooperation with private enterprises that have access to markets. Other examples of issues include an undeveloped distribution infrastructure, small domestic markets, the private sector being undeveloped in terms of the processing and distribution of agricultural products, and most processed agricultural products being import goods.

(4) Points for concern in extending cooperation

1) Support and development for farmers' organizations and private sector

Consideration can be given to baseline surveys for narrowing down promising products and producing centers that could serve as business models, and to technical guidance for the improvement of processing, post-harvest processing and value-adding technology by experts and senior volunteers. Support for the establishment of farmers' organizations to serve as a pillar of the processing industry, and support for strengthening existing organizations and for the conduct of market surveys and product development seminars is also effective.

2) Improvement of infrastructure

Support via two-step yen loans can be considered for capital assistance to small and medium-sized enterprises engaged in the processing of agricultural products and foods.

Specifically, in terms of improving infrastructure for the promotion of the processing and distribution industry, consideration can be given to collecting and providing market information, conducting seminars on shipping, transportation and selling, developing storage and processing facilities, improving distribution roads, and developing wholesale markets.

3) Support for administrations

The role of administrations in promoting the processing and distribution industry is wide ranging, from formulating policies and developing systems and standards, to providing technical support to farmer and producer cooperatives. Given this, in terms of the development of administrative systems, consideration can be given to clarifying the division of roles of relevant organizations and to providing support for strengthening coordination (dispatch of experts). Training staff from bureaus and departments connected to agribusiness is also effective.

In addition, given that workplaces connected with the processing and distribution of agricultural products come under the jurisdiction of the Ministry of Commerce and Industry more so than the Ministry of Agriculture, attention needs to be given to cooperation between counterparts.

Mid-Term Objective 3-4: Strengthening export promotion measures

(1) Summary of concept

1) Scope of mid-term objective

In developing countries where the primary industry plays a dominant role, promoting and expanding exports of agricultural products is an effective means of spurring economic growth and gaining precious foreign currency. Generally speaking, however, the agricultural products of many developing countries lack competitiveness in price and quality. Furthermore, since donors like the United States and European countries have been pushing their own exports to developing countries based on policies of massive export subsidies aimed at promoting their own agricultural production and protecting their own producers, cooperation in export-promotion efforts of developing countries has never been a major theme of aid. As globalization progresses in the international community and free trade systems are promoted under the WTO, amid this current international framework, developing countries aim to enhance their own export-promotion policies in line with their agricultural development strategies.

2) Specific details of cooperation activities

(i) Capacity building for planning export policies

Within national and agriculture-sector development strategies, clearly define the position of macro-level policies for promoting the export of agricultural products. In addition, build capacity for policy development and planning, keeping it in balance with domestic policies for food security and for the promotion of agricultural production.

(ii) Improving export systems and structures

In implementing the formulated policies, make export-related systems and procedures transparent and train personnel involved in the export business.

(iii) Strengthening export competitiveness

The export competitiveness of agricultural products must be increased in order to distribute them in the international market and to expand exports. The approach to assisting the strengthening of export competitiveness can be considered on two fronts: "improvement of agricultural productivity" and "improvement in the quality of agricultural products."

By improving agricultural productivity, the inexpensive and stable supply of agricultural products becomes possible.

(iv) Improving international marketing capabilities

In order to sell agricultural products with a competitive edge in the international market and develop agriculture as an export industry, set up a framework so that the governments of developing countries can actively improve information services for the private sector, which is saddled with various problems, including shortages of human resources, lack of international marketing capabilities and difficulty in developing overseas markets on their own.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-1 "Capacity building for policy planning and implementation in the field of agricultural and rural development, "Formulating food supply/demand policy," 3-3 "Promoting the agricultural processing industry" and 2-3 "Improving import systems."

(2) Current state of JICA projects

1) Cooperation for the general promotion of exports

• Technical Cooperation for Development Planning: Study on Support for Development of Supporting Industries in Indonesia (1999 to 2000)

After the impact of the economic crisis, six industries (textiles and textile goods, food and beverages, wood products, electrical and electronic components, auto parts, and machine parts) were surveyed, looking at the environment surrounding exporters and on the actual conditions of exporters. Based on this, suggestions were made on the rebuilding of export industry policies, improving competitiveness and the formulation of an action plan.

 Training and Dialogue Program: Strengthening the Export Competitiveness of Small and Medium-sized Coffee Producers (JICA Tokyo) (FY2009 to FY2011)
 Acquire the know-how required to strengthen the competitiveness of exported coffee (identification of market needs for high-value-added coffee, knowledge on export regulations, etc., quality and production control, marketing), and share that know-how widely among cooperative producers.

2) Cooperation for strengthening the competitiveness of exported agricultural products

• (Laos) Laos Pilot Program for Narrowing the Development Gap towards ASEAN Integration (October 2010 to October 2015)

With an aim of stimulating the trade of commercial crops (vegetables and fruit) within the ASEAN, ASEAN member nations have been encouraged to introduce the ASEAN Good Agriculture Practice (ASEAN GAP). Laos, however, has not proceeded to introduce ASEAN GAP. In cooperation with the Lao Ministry of Agriculture and Forestry, the aim of this project is to promote the introduction of the ASEAN GAP in Laos, by collecting information and analyzing the present situation regarding: relevant policy systems, the organizational structure and capacity of administrative bodies, the current state of farmers' agricultural production activities, and the distribution and markets of agricultural products. Based on this, the issues and solution strategies for introducing the ASEAN GAP will be summarized into a road map, and a number of model districts will be specified before conducting a verification project introducing the ASEAN GAP on a trial basis.

3) Cooperation for improving inspection techniques

• Technical Cooperation Project: Standardization and Quality Control for Horticulture Products of Indonesia (Improvement of Thermal Treatment Technique against Fruit Flies on Fresh Mango) (March 2009 to March 2013) The Indonesian government already exports a constant volume of mangoes to Singapore and other countries, but because Indonesia has a large population of fruit flies that live parasitically in mangoes and inflict tremendous damage, the export destination countries are limited to those already inhabited by fruit flies or those where mangoes containing parasitic fruit flies are not subject to plant quarantine. This project supports the establishment of a vapor heat treatment technique to neutralize fruit flies, with an aim of promoting the export of fresh mangoes from Indonesia.

(3) Issues in implementing projects

- 1) Looking at the developmental process of agriculture, many regions will usually transition gradually from subsistence farming to market-oriented farming (except for regions where plantation farming is practiced and countries that have a socialist economic structure). In recent years, factors have emerged which greatly accelerate this trend. Needless to say, one of them is the advance of globalization via the WTO and FTAs, and another is the expansion of the so-called middle class as a consequence of economic growth in developing countries. Amid difficult circumstances, developing countries have put forward responses to markets appearing at home and abroad, as well as responses to the influx of cheap agricultural products from overseas.
- 2) Over the past few years, it has been the substantial rise in food prices since 2007 that has further influenced this trend. Although this was triggered by unseasonable weather internationally and the surge in crude oil prices, what makes this different from before is that, amid growing uncertainty over the international supply and demand of food from a medium- and long-term perspective, agriculture in developing countries is drawing considerable attention as an export market.
- 3) In the past, in many countries, agriculture was only ever given a low priority as an industry with poor investment efficiency, but in response to recent circumstances, it is now being reconsidered, both in terms of its investment efficiency as a commercial undertaking and as a driving force for growth of the national economy. In view of this situation, there is an increasing need in agricultural development assistance to consider a form of development that is mindful of markets.
- 4) In general, cooperation must be restricted for countries or products for which there are concerns of a boomerang effect on Japan's agriculture sector. However, as an exception, with respect to those products which Japan relies on imports, such as soybeans and corn, explore the possibilities of cooperating with private enterprises in providing support for improving quality control and productivity in the exporting country.

(4) Points for concern in extending cooperation

1) Capacity building for planning export policies

When providing support for macro-level export promotion policies, the approach needs to be modified depending on various prevailing factors, such as: *What proportion of a country's exports does its agriculture sector account for? How developed are the systems and standards necessary for export promotion? How strong is the private sector?* For example, for agricultural products whose international markets are well-established and stable, consideration needs to be given to export-promotion policies that suit domestic food security conditions and risk levels, such as

providing support for drawing up policies for promoting the exports.

2) Improving export systems and structures

General aid measures for the least-developed countries, such as those in Africa, could involve: the design of laws, regulations and systems concerning the formulation of export promotion policies from a medium- and long-term perspective; advice on existing export promotion policies; and support for measures aimed at diversifying export destinations and products or strengthening mechanisms to promote exports and funds to manage major agricultural export products.

3) Strengthening export competitiveness

In order to improve the quality of agricultural products, consideration can be given to support for technology for preserving and managing the quality of harvested agricultural products, processing agricultural products to add value, establishing systematic "certification standards and criteria" and quality control.

Since concerns about food safety and genetically modified agricultural products have been growing, assistance for importing countries can also be considered in such areas as the thorough enforcement of regulations on food sanitation standards and agrochemical residue standards, as well as plant quarantine.

4) Improving international marketing capabilities

As a specific approach, it is important first to consider strengthening the functions of actual public trade organizations. Then, aid can be considered for facilitating government efforts to provide the private sector with information on the international market and information on trade systems, procedures and commercial practices of export destinations. Aid can also be considered for improving systems for accessing information on important international market trends and prices, as well as for providing information on general trade policies established by the government.

In addition, within the framework of agricultural development and as part of the promotion of micro, small and medium-sized enterprises, it is also important to help private enterprises in developing countries, which are faced with shortages of human resources, technology, management know-how, finance and equipment, to strengthen their export competitiveness, including the development of agricultural products and training in processing technology.

Mid-Term Objective 3-5: Improving non-farming income

(1) Summary of concept

1) Scope of mid-term objective

In general, farmers in developing countries manage small-scale farms, and in most cases, are reliant on rainwater. As a consequence, agricultural income is low and unstable. According to surveys conducted from the 1970s until the 1990s, the average ratio of farmer's non-farming income was high, at 42 percent in Africa, 40 percent in Central and South America, and 32 percent in Asia. In order to diversify their livelihood risks, farmers employ various means of income.⁶¹ Improving non-farming income supplements the agricultural income of small farmers by deriving sources of income from activities outside agriculture, such as the sale and processing of agricultural products.

On the other hand, core workers traveling to urban areas for work and improvements of non-farming income through better rural investment environments also require consideration as other forms of non-farming income.

2) Specific details of cooperation activities

An element of cooperation is cash income through the effective and sustainable use of local resources, such as from forming specialty products, distributing existing traditional craftworks and from tourism.

3) Connection with other mid-term objectives

This mid-term objective is related to processing technology, distribution and finance, including Mid-Term Objectives 2-2 "Development of food distribution," 2-3 "Improving import systems," 3-3 "Promoting the agricultural processing industry," 1-7 "Agricultural financing," and 3-5 "Promoting livelihood improvement." From the perspective of improving access to employment opportunities, it also relates to Mid-Term Objective 3-8 "Improving the health and education standard of rural residents."

(2) Current state of JICA projects

• Technical Cooperation for Development Planning: The Study on Development for Enhancing Rural Women Entrepreneurs in Sabah, Malaysia (January 2002 to December 2003)

The Malaysian state of Sabah has the country's highest poverty rate. A master plan was formulated and a verification study conducted with an aim of achieving increased incomes and regional improvement here through the entrepreneurial activities of women.

Efforts were undertaken for a number of projects relating to non-farming income, including: proceeds from paper made using the fiber of potatoes and bananas, candles made from beeswax and candles made using seashells and the flesh of coconuts, through the Project for Utilizing Unused Resources and Waste Materials; agro-tourism (mountain lodge management) and One Village One Product

⁶¹ Tom Reardon, Rural Non-Farm Income in Developing Countries, http://siteresources.worldbank.org/DEC/Resources/ruralNonfarmIncomeinDevelopingCountries.pdf

(OVOP: bead craftworks, etc.) through the Project for Expanding the Market of Local Products in Conjunction with Tourism Development; strengthening of related organizations through the Project for Strengthening Related Organizations to Promote Craftworks; and providing better service to female entrepreneurs in agriculture through the Project for Expanding the Effects of Microfinance Programs.

• Loan Aid: (Thailand) Agricultural Credit for Rural Development and Job Creation Project (L/A signing date: September 30, 1998)

In line with the key objectives of the Eighth National Economic and Social Development Plan, in addition to improving the efficiency of agricultural production activities, improving the quality of agricultural products, promoting afforestation and promoting environmental agriculture, this project aimed to provide employment opportunities in rural areas in order to respond to the currency and economic crisis at the time. Loans through the Bank for Agriculture and Agricultural Cooperatives (BAAC) have been primarily used to finance the provision of sub-loans to small-scale farmers in regional areas and to employ consultants to strengthen accounting management and the monitoring of yen-loan projects.

(3) Issues in implementing projects

The process of linking the development of specialty products made with unused resources or local resources to raised incomes entails many complex issues and constraints. Generally speaking, quality of products and services is not adequately ensured in developing countries, and they lack sufficient human resources to do so. Furthermore, the extent of alternatives for non-farming income varies depending on whether the country is rich or poor in local resources. A further external condition is the level of social infrastructure development, such as the transport sector and the electrification of rural areas. Following are some specific examples.

- (i) Local residents do not effectively utilize local resources and unused resources, or lack the knowledge and/or technology to do so.
- (ii) Engaging in group activities is not a traditional practice, and there are no structures for systematically developing businesses capable of generating the benefits of non-farming income.
- (iii) The main means of generating non-farming income is dealing in craftworks. However, in cases where this is managed privately or by a family as a side job or domestic piecework, there is variation in the quality of the product or service, and the production volume and available services are also limited. Even if quality is recognized, a situation arises where supply cannot keep up with demand, and delivery deadlines are not met.
- (iv) Local residents lack experience in managing business operations. In order to launch a business generating non-farming income, even supposing physical facilities are improved, certain risks cannot be assessed, including the capabilities of local builders, the fluctuation of construction equipment and materials, and meeting the costs of maintenance once facilities are complete. Getting the wheels moving for a business generating non-farming income requires training of local residents by external organizations, dissemination, development of sales channels and markets, and

all of these also take time.

- (v) In rural areas, it is difficult to obtain market information due to delays in the development of communications and IT infrastructure. Although the number of farmers using mobile phones has increased even in rural areas, most of the small-scale farmers targeted by JICA can still not afford to own a mobile phone.
- (vi) Procuring funds for business start-ups or management is difficult. For people living in rural areas who operate a family business like a side job or domestic piecework, and who have no collateral, getting a loan from a bank is extremely difficult, and access is limited to microfinance offered by NGOs and development banks.
- (4) Points for concern in extending cooperation

In the case of development at the wide-area level, JICA has experience in providing loans to farmer groups and rural enterprises through two-step loans like with the Bank for Agriculture and Agricultural Cooperatives (BAAC)⁶² in Thailand. In the case of cooperation at the pilot-project level, JICA has experience in programs relating to non-farming income as a component of integrated rural development projects and technical cooperation for development planning. As for human resources development, such as the transfer of skills and management know-how, schemes such as the dispatch of volunteers (in particular, senior volunteers with experience in managing product development and distribution) and grass-roots technical cooperation are regarded as suitable.

1) Promoting the use of local resources and unused resources

Even if local residents are well aware of local resources, they lack the mindset to utilize these resources for the purpose of generating new business. Prior to developing a program for non-farming income, residents need to appreciate what unused resources are available in their local area, and even for already-known resources, they need to be aware of whether there are any new methods for using or processing them. Therefore, when starting cooperation, it is vitally important to get local residents to carry out their own assessments on local resources, using such techniques as participatory rural appraisal (PRA).

Furthermore, to achieve the sustainable use of resources, also consider the environmental burden and other impacts of using resources.

2) Supporting group activity and other forms of organization

Establishing a non-farming income program as a business requires efficiencies based on group activity as well as quality control. Furthermore, by getting production groups to build networks with other organizations and circulate information, raw materials and products on a group basis, it should be possible to achieve efficiency and reduced production costs (formation of supply chain management), and it should also be possible to improve market access to nearby regional economies.

⁶² Financial Support for the Promotion of Rural Enterprises: Using the Example of the Bank for Agriculture and Agricultural Cooperatives (BAAC), Thailand, Research Institute for Development and Finance, Japan Bank for International Cooperation (October 2000)
3) Human resources development through training

Ensure that products and services of a certain quality are produced by providing technical training at workshops, etc. Two points are important here: (1) In order to ensure that the training is sustainable, begin involving the dissemination organizations at the local government while JICA is still providing cooperation, and ensure that consideration is given to securing a budget so that know-how and training can be maintained independently by the administration even after JICA's cooperation concludes; and (2) Establish courses on technologies that the trainees actually want to learn. With regard to the second point, if technical courses can be developed for which residents are happy to pay money to attend, these fees could cover some of the costs for running the training courses which are incurred by local governments burdened by chronic financial worries.

4) Start from a size suited to the management resources (capacity of local residents, local resources) In creating an "opportunity" for unfamiliar non-farming income, rather than making an initial investment that exceeds the capacity of the local area, it is better to adopt a technique of starting from a small-scale program that requires only a small investment and which produces benefits early on, and then, while checking the strengthened capacity of the organization, to gradually step up the program. In this instance, the input of senior volunteers who have management know-how from private enterprises would seem to be particularly effective.

5) Migrant workers in urban areas remitting money back home to rural areas

In the rural areas of developing countries where the installation of fixed-line telephones is limited mostly to urban areas, the use of mobile phones has spread rapidly. The features on modern mobile phones are diverse, but one of these functions is a system allowing migrant workers to use their mobile phones to remit money back to rural areas. In this respect, the private sector is currently at the center of this advancement. Nevertheless, the system is spreading rapidly, and it is expected that it will have to be considered as one of the tools for cooperation in rural development. It would appear that there is a strong chance that the building of a business model in rural areas using this system will become the subject of JICA's cooperation.

BOX 3 below introduces M-PESA,⁶³ a remittance system in Kenya that uses mobile phones, which is said to be currently the most successful system of its kind.

6) Improving the rural investment environment

In order to realize improvements in non-farming income, conduct an investment-related business assessment. In doing so, consider infrastructure development and capital investment that is suited to local conditions, reflecting on what has the potential to lead to corporate investment that facilitates employment in rural areas and what will contribute to the development of entrepreneurs in rural areas.

⁶³ Innovations in Rural and Agriculture Finance, IFPRI, 2010

BOX 3 Systems for remitting money via mobile phones

M-PESA was launched in 2007 by Safaricom, Kenya's largest telecommunications operator. Now, it has 7 million users. (Kenya has a population of 38 million, and 18.3 million mobile phone users.) Initially, it was used to remit money from <u>urban</u> to rural areas, but now it is used for all manner of applications, from paying school tuition fees to paying taxi fares. Daily remittances total about 2 million dollars, with the average amount per transaction being 20 dollars. It is said that mobile money has resulted in an increase in rural household income of between 5% and 30% (according to a study by an ethnographer from the University of Edinburgh).

Following are the factors underlying the success of Safaricom's M-PESA in Kenya:

- Other methods of remittance cost more.
- Safaricom (subsidiary of Vodafone) has a large market share (80%).
- While not official, the supervisory authority has given approval for mobile banking.
- M-PESA was recognized as being a means of protecting money that is safer than the banks caught up in the riots and ethnic disputes following the election in early 2008.

As a consequence of M-PESA's success, banks and the supervisory authority have shown indications of permitting non-bank telecommunications operators to provide financial services. A number of banks have also teamed up with telecommunications operators with the intention of launching mobile money services. This is because mobile phone brands have clearly spread among more users than bank brands.

Mid-Term Objective 3-6: Improving the rural living environment

(1) Summary of concept

1) Scope of mid-term objective

Improvement of the rural living environment covers improving infrastructure in the living environment in rural areas, including rural roads, rural electrification, communication and information networks, public transportation networks, medical facilities, and water supply and drainage facilities. Since rural communities are both a place of production and a place for living, improving the living environment in farming villages means collectively improving the infrastructure for agricultural production and improving infrastructure in the living environment.

2) Specific details of cooperation activities

In addition to improving "hard" aspects, such as infrastructure for agricultural production and infrastructure in the living environment, it is also essential to enhance "soft" aspects to operate and maintain that infrastructure in a sustainable manner. In particular, since "soft" aspects significantly affect the degree of utilization and the useful life of "hard" infrastructure, improve these ahead of any programs for improving physical facilities, or at least start them in tandem. Moreover, by the time facilities and other "hard" aspects are complete, ensure systems are built for the division of roles, cooperation and provision of incentives for the relevant actors. In improving physical facilities, it is important not to burden the environment, such as ecosystems and the lives of residents.

3) Connection with other mid-term objectives

Mid-Term Objectives 1-2 "Improving, maintaining and managing production infrastructure," 1-5 "Farmers' organizations," and 3-6 "Promoting livelihood improvement."

(2) Current state of JICA projects

- Loan Aid: (Philippines) Agrarian Reform Infrastructure Support Project (Phase I III) (ARISP) (L/A signing dates I: August 30, 1995; II: December 28, 1999; III: December 18, 2007) At Agrarian Reform Communities (ARCs) across the Philippines, efforts were made to effectively utilize allotted agricultural land and raise farmer incomes by: (1) constructing new and repairing existing common irrigation and drainage facilities in ARCs; (2) developing post-harvest facilities; (3) constructing access roads to markets; and (4) developing and strengthening organizations such as irrigation associations.
- Loan Aid: (Bangladesh) South-Western Bangladesh Rural Development Project (L/A signing date: March 24, 2010)

The purpose of this project is to upgrade 130 rural roads in poor rural areas in 14 districts in southwestern Bangladesh, and to improve incidental rural infrastructure having synergistic effects in 50 locations, such as markets, bridges and wharfs. The project will also strengthen the capacity of relevant organizations for implementing improvements to rural infrastructure effectively, and will

provide training to women's groups (tree planting along the shoulder of the road, light maintenance).

• Loan Aid: (Bangladesh) Eastern Bangladesh Rural Infrastructure Development Project (L/A signing date: March 22, 2005)

This project aims to improve access to economic opportunities and social services for poor people living in poor rural areas in eastern Bangladesh by improving agricultural infrastructure in these areas, thereby helping to rectify economic and social disparities between urban and rural areas in Bangladesh. (1) Improvement of rural infrastructure: Overall length of Upazila Roads: 1,000 km, overall length of Union Roads: approximately 120 km, other rural infrastructure (bridges, wharfs, village administrative facilities, rural markets, etc.) (2) Capacity building for implementing agency (development of equipment and materials, employment of experts, training, etc.)

(3) Issues in implementing projects

1) Important matters regarding reducing the environmental and social burden of constructing infrastructure in rural areas

Especially with respect to economic infrastructure, such as irrigation and drainage facilities, development of farmland and rural roads, any out-and-out pursuit of economies will end up producing environmental and social burdens, such as the destruction of ecosystems and the involuntary relocation of residents and inadequate compensation. When it comes to the improvement of infrastructure in the rural areas of developing countries with large numbers of poor people, there is a tendency for plans that are attentive to the reduction of environmental and social burdens to be treated in a superficial manner. Two challenges in this regard are the introduction of technology that achieves both economic benefit and social benefit provided by the natural environment, and the education of recipient governments and local residents. Furthermore, the concept of rural living environment varies widely depending on the development status of the country. Given this, consideration should also be given to cooperation in such areas as water drainage in villages and the treatment of livestock sewage in urban neighborhoods in the original ASEAN member countries.

2) "Soft" responses, such as formation and strengthening of organizations

Many infrastructure projects of the past attest to the fact that strengthening "soft" aspects is essential to the effective utilization of infrastructure and to increasing the useful life of that infrastructure through appropriate maintenance. However, a challenge in making an organization function continuously is how to successfully provide economic incentives that will encourage the users of rural infrastructure, namely farmers, to actively participate in its maintenance, including the accumulation of reserves for administrative costs and the provision of labor.

Although the involvement of administrations is essential in maintaining infrastructure for agricultural production and for the living environment, developing countries are faced with a number of considerable challenges that they must overcome. First, since rural areas are usually geographically located far away from the central government, accessing administrative services here is difficult. Moreover, generally speaking, local governments and regional offices are more under-budgeted than

the central government and so have a serious shortage of human resources for managing infrastructure.

(4) Points for concern in extending cooperation

1) Technical cooperation

Overall rural development plans are implemented by means of technical cooperation projects and technical cooperation for development planning. In the main, it is important to develop the capacity of farmers, rural residents and counterpart agencies. In doing so, attention needs to be given to the following points.

(i) Giving top priority to the formation and strengthening of organizations

As mentioned above, the formation and strengthening of organizations is an area that must be given top priority in order to realize improvements in the rural living environment, including infrastructure development. Prior to constructing facilities, management associations comprised of beneficiaries need to be formed, and there needs to be sufficient mutual understanding and consensus building regarding utilization plans and regarding cooperation and the division of roles for facilities maintenance. For this purpose, starting from the time plans are drawn up for construction of the facilities, while securing the participation of residents, efforts need to be made to identify the scope of convenience and benefits to be derived from constructing the facilities and to gain the understanding of residents.

(ii) Ease of maintenance

Making facilities easy to maintain is essential for their continued use.

- Facilities should be designed so as to not require much maintenance, with few malfunctions and little degradation.
- The degree of any malfunctions or degradation should be able to be managed within the capacity of the people involved. For example, for relatively low-level facilities and social infrastructure constructed on the presumption that rural residents will provide labor and locally available technology will be used, any faults, etc. should be able to be dealt with by technicians at the local government level without the need for professional engineers. Also take into account the availability of spare parts and any equipment and materials needed for repairs.
- When constructing facilities, also give consideration to providing opportunities for rural residents to gain experience necessary for maintenance, by getting them to participate in the construction, such as employing them as workers or to provide services.

2) Financial aid

In pursuing improvements in the rural living environment and helping to raise incomes across a wide area, both grant aid and loan aid can be considered. If grant aid is selected, since it is highly likely that more advanced technology will be adopted, in addition to giving due consideration to ease of maintenance as mentioned previously, consideration should also be given to improving the technological capacity of beneficiary farmers through tie-ups with technical cooperation. Even if loan aid is selected, "soft" components need to be utilized in developing the capacity of both government staff and beneficiary farmers, while carefully examining the business program of the partner country government and also taking into account the maintenance of facilities once they have been constructed.

Furthermore, by achieving cofinancing with the World Bank, the ADB and other donors, there is potential for even wider support.

Mid-Term Objective 3-6 Reference 1: More careful consideration of the environment

As a consequence of the advance of profit-oriented agriculture, not only in developing countries, but across the entire world, the burden imposed by agriculture and rural activity on the environment has grown too significant to ignore. Environmental problems have begun surfacing in agriculture and rural areas. Developing countries in particular have few competitive export items other than primary products, and because of this, they often pursued strategic development plans that placed priority on increasing the production of cash crops (coffee, cacao, palm oil, etc.) which would earn them foreign currency. As a result, land suited to agriculture was increasingly turned to the cultivation of cash crops, driving arable and pastoral farming necessary for farmers to earn a living to marginal land areas with only weak environmental resilience. In many cases, this resulted in a vicious cycle of environmental destruction, with the production base being destroyed over a short period of time, which in turn forced farmers to engage in arable and pastoral farming on even more unfavorable land. Against this background, hopes have grown for the development of environmentally sound agriculture and sustainable agriculture, in which agricultural production is conducted within the scope of the environmental capacity of the natural ecosystem.

Environmental destruction in agriculture and rural areas takes the form of environmental pollution and the destruction of amenity and nature (environmental resources). A modern approach to dealing with these problems includes processing agricultural waste and its effective utilization, reducing the environmental burden stemming from the use of fertilizers and agrochemicals, maintaining and developing multifunctionality, and enriching environmental education.

(1) Processing of agricultural waste and its effective utilization

Processing agricultural waste and utilizing it effectively is hugely effectual in preventing the pollution of the natural environment. Left untreated, animal excretion is just industrial waste, but it is possible to put it to effective use by turning it into compost or a source of biomass energy. This is also essential for maintaining soil fertility. Since vinyl and plastic waste from agricultural materials cause serious problems, generating dioxin when incinerated, for example, consideration needs to be given to establishing an appropriate disposal promotion system and introducing alternative materials.

(2) Reducing environmental burden caused by fertilizers and agrochemicals

Soil, which forms the outermost layer of the earth's surface, is produced by the extensive workings of nature and is essential as the base for growing plants. However, using soil in a way which ignores its capacity to absorb environmental burden⁶⁴ has led to its degradation and desertification across wide areas. In order to help maintain this capacity, appropriate soil management is necessary which combines steps to improve: the chemical properties of soil through the application of proper fertilizers; the physical qualities of soil through the use of organic materials and deep-earth cultivation; and the biological qualities of soil through an increase in the amount of useful microorganisms and small animals

⁶⁴ Soil has a physical buffering capacity to reduce temperature changes, a chemical buffering capacity to prevent radical changes in nutrition and pH levels, and a biological buffering capacity to stem a rapid increase of germs caused by various soil organisms. Many plants can attain sound growth with a sustainable maintenance of those functions.

in the soil.65

In the agricultural environment where the same crop is grown across wide areas, microorganisms, pests and weeds tend to spread making the crop susceptible to damage. Agrochemicals have had a dramatic effect in eliminating these harmful organisms, but since an excessive reliance on agrochemicals leads to more pronounced environmental problems, like residues and a concentration of agrochemicals throughout the food chain, it is necessary to select ways that will reduce the burden on the environment while at the same time holding costs down to a minimum. These ways include: development of disease-resistant varieties; biological control through the use of natural enemies; physical control employing vinyl film and netting; and cultural control like crop rotation. Another is the introduction of integrated pest management (IPM) programs that make appropriate and efficient use of these above techniques to reduce damage from harmful insects and diseases to levels that are economically negligible.

Various approaches are being taken to further rationalize the VAC system,⁶⁶ the traditional mixed farming method used in Viet Nam. These approaches represent one of the attempts in environmental protection-style agriculture aimed at reducing the burden on the environment. In this attempt, the raising of ducks and other animals has led to reduced use of agrochemicals, and is contributing to environmental improvements, not only to the natural ecosystem, but also to living conditions.

(3) Maintaining and developing multifunctionality

Multifunctionality of agriculture means the overall functions⁶⁷ of agriculture and rural areas, apart from food production, which cannot be viewed in terms of economic efficiency alone. They include conservation of the natural environment, land (prevention of landslides, floods, etc.) and beautiful scenery in rural areas, as well as the handing down of local cultures. These functions serve not only residents in rural areas but also those in urban centers. By viewing these functions as an amenity, developing a deep awareness of their value, and making active use of them, it is possible to realize a life of affluence in rural areas.

In order to maintain and enhance this multifunctionality, it is important not only to implement appropriate agricultural land management aimed at conserving soil, agricultural management that takes biodiversity into consideration (appropriate use of agrochemicals, etc.) and management of undeveloped

⁶⁵ If less fertilizer is applied than the amount of nutrients taken out, soil fertility will be lowered, making it difficult to sustain agriculture. On the other hand, an amount exceeding the soil's capacity to absorb the nutrients will lead to pollution of the environment. It is essential, therefore, to use a proper amount of fertilizer based on appropriate soil tests.

⁶⁶ VAC is an acronym of three Vietnamese words: "vuon" (meaning orchard), "ao" (pond) and "chuong" (animal barn). Today, "V" embraces all use of land, "A" comprises water resources and their development, and "C" includes all use of animals.

⁶⁷ Included in multifunctionality directly related to agricultural production are conservation of land and the recharging of groundwater. Terraced paddies and fields on slopes serve to prevent soil erosion and landslides. Farmlands and paddy fields slow down the runoff of rainwater, thereby helping to prevent floods and recharge groundwater.

Ecosystems based on native vegetation different to that in primeval forests are distributed in undeveloped lands around farms and communities, providing habitats to wild animals and helping maintain the diversity not only of plants but also of small animals, birds, insects, soil organisms and bacteria.

Farmers settling in rural areas help maintain the local community and culture. The scenery and environment in rural areas have functions of assisting health and recreation and cultivating artistic sentiment for people from outside the local community. These are both considered to be part of the multifunctionality of agriculture in social sustainability.

The OECD has also been discussing the multifunctionality of agriculture (Food and Agriculture Policy Research Center (2001)).

lands near communities (prevention of unrestrained land development and overgrazing), but also to be mindful of respecting traditional cultures.

(4) Enriching environmental education

These days, environmental issues have begun to emerge on a global scale, and their impact on the agricultural environment is being closely studied. In order to deal with these environmental issues, systems and organizations need to be built for promoting sustainable use, management and maintenance of natural resources and the natural environment on a country or regional basis. In economics, the environment is a public asset characterized by collective consumption. At the same time, it is a region-based asset closely related to the history and culture of each region. It also has a nature of irreversibility: once destroyed, it is difficult to restore. Therefore, residents in each region need to appreciate the characteristics of their environment and fulfill their respective responsibilities for its preservation. Since agricultural and rural development have both positive benefits and adverse effects over the environment, it is the responsibility of governments, in developing countries as well as in others, to expand and reinforce environmental education providing accurate knowledge and information on the environment to farmers who, after all, are the ultimate beneficiaries of agricultural and rural development.

JICA's "environmental considerations" in agricultural development have been manifested mostly in technical support as embodied into individual projects. Among them are a technical cooperation project carried out in Brazil called the Technological Development Project for Sustainable Agriculture in Eastern Amazon (March 1999 to February 2004), and a grant aid project conducted in Mongolia called the Project for Freshwater Resources and Nature Conservation (E/N May 2010). In these projects, carried out as part of an approach to the establishment of a system and an organizational structure for the sustainable use and management of natural resources and the natural environment, a mixed planting technology for tropical fruit and pepper as main cash crops was established to support the livelihood of small farmers while enabling them to live harmoniously with their natural environment.

Among the projects for aid in environmental policy planning designed to prevent destruction of the environment is technical cooperation for development planning, including the Study of Prevention for Desertification in the South Region of Segou in the Republic of Mali (July 2004 to January 2008), and the Study on Sahel Oasis Development in the Republic of Niger (August 2005 to July 2009).

Regarding institutional support for developing countries for implementing international environmental protection agreements (biodiversity, desertification prevention and other treaties), support provided through technical cooperation for drafting master plans and support for the creation of networks among past participants in JICA's group training courses are effective.

Also, projects for building systems for the treatment and reuse of agricultural waste and projects for minimizing the environmental burden of agrochemicals and chemical fertilizers, such as the establishment of standards suited to local conditions, are becoming increasingly important, as are those aimed at improving the awareness of local residents for environmental issues and those promoting development that emphasizes local characteristics and identity. These are projects JICA should further advance in the future.

Mid-Term Objective 3-7: Promoting livelihood improvement

(1) Summary of concept

1) Scope of mid-term objective

"Living" is doing things or thinking about things in life while adapting to society. "Livelihood improvement" refers to making the living environment better (such as community, work and education) or making the physical or mental state of the actual person better. Farmers' lives are easily influenced by agricultural management, and are often bound by convention and their reliance on self-sufficiency. Therefore, make livelihood improvements by thinking about the appropriate solution for problems while recognizing these characteristics.⁶⁸

2) Specific details of cooperation activities

A key component to activities is that they improve life skills and/or the living environment of individuals, such as projects for nutritional improvement, projects for the improvement of stoves and health-related projects, but at the same time, they must also foster an attitude of acceptance of and participation in the subsequent process of larger development and advancement.

3) Connection with other mid-term objectives

This mid-term objective is related to Mid-Term Objectives 3-2 "Improving non-farming income," 3-6 "Improving the health and education standard of rural residents," 3-7 "Participatory rural development," and 3-8 "Gender in rural communities.

(2) Current state of JICA projects

- Technical Cooperation Project: (Mexico) Project on the Assistance for Sustainable Rural Development in Soconusco Region, the State of Chiapas (PAPROSOC-2) (September 2006 to March 2010) Unlike the "anticipatory dissemination of technology content" often seen in past projects, this project made use of a more in-depth understanding of Japan's experience in, and ideas on, the livelihood improvement movement.
- Technical Cooperation Project: (Philippines) Project for Improvement of Farmers Income and Area Development (July 2000 to June 2005)

Regarding health promotion activities carried out by agricultural cooperatives and community-based organizations as important parts of livelihood improvement activities, resident participation focused on agricultural cooperatives and village pharmacies run by agricultural cooperatives were used and managed. The project demonstrated that Japan's model for rural health of promoting agricultural cooperatives and the organization of local residents and then conducting specific livelihood improvement and healthcare activities according to the needs of local residents is also effective in developing countries.

⁶⁸ Crossroad 2010, Special Edition, Wisdom of Japan the Developing Country: Learning from Japan's Post-War Movement for Livelihood Improvement, p.8 (Keyword: livelihood improvement).

• Area-focused Training: Rural Community Development by Livelihood Improvement Approach for Africa (JICA Tsukuba)

(FY2009 to FY2011)

Training aimed at staff involved in rural development in different countries acquiring knowledge and techniques related to the livelihood improvement approach, and being able to utilize them in their own work.

Area-focused Training: Leadership Training for Women Through Rural Life Improvement (by Kaizen) for Central and South America (JICA Tsukuba) (FY2007 to FY2009)
 Training aimed at teaching the implementation systems and characteristics of rural development programs and rural subsidy programs through livelihood improvement in Iwate Prefecture, Japan, and reflecting this in policy-making in the field.

(3) Issues in implementing projects

The need for livelihood improvement in rural areas comprises many uncertain elements. Though such a need generally exists in the lives of residents and throughout the entire environment that surrounds them, in reality, it is heavily influenced by the awareness of local residents and farmers, and also by the attitudes and views toward humanity and society held by those involved in promotion efforts. Consequently, a challenge in planning programs is to optimize the programs while minimizing these uncertainties. A problem often encountered in JICA's cooperation for livelihood improvement in developing countries was the "anticipatory dissemination of technology." New technologies such as for making handicrafts and improving stoves would be introduced by extension workers, but it has been suggested by study teams that local residents would not fully recognize why such technology was being used and would not regard the introduced technology as inspiring a series of improvement activities.⁶⁹

Given this, rather than an administration unilaterally offering services to residents, it is essential that the administration collaborate with residents in developing the services while respecting the problems for improvement which have been raised by the residents themselves.

Furthermore, given that "livelihood improvement" and "dissemination of farm management" supporting production are two halves of the same whole, it is preferable that the counterpart agency be a bureau or department that handles both.

(4) Points for concern in extending cooperation

Taking into account the characteristics of Japan's livelihood improvement, which achieved the results shown in 1) to 3) below, implement it in practice while bearing in mind the cultural and social systems of the recipient country or region.

1) Development of legal systems, support for institution-building and strengthening of existing systems through the education of administrations

The Agricultural Improvement Promotion Act was enacted in Japan in July 1948, and it led to the

⁶⁹ JICA (2003c) p.39

creation of agricultural extension workers—primarily men in charge of disseminating agricultural technology—and livelihood improvement extension workers (*Seikai-san*)—primarily women in charge of improving life in rural areas. In order to continually increase food production, more than just innovating agricultural technology, it was essential to improve the livelihoods of those engaged in farming, including improving their nutrition, improving the sanitary conditions of their homes, and improving the working conditions of female farm workers. It is important to make administrations of developing countries aware of this point and to work on developing their legal systems, providing support for institution-building and strengthening their existing systems.⁷⁰

2) "Dissemination methods" used by Seikai-san

In Japan, investigations were undertaken on the problems of village life and the resources available there, and countless workshops were held with *Seikai-san*. Through this, techniques and approaches to participatory dissemination were developed, leading to today's participatory rapid appraisal (PRA) and participatory learning appraisal (PLA) methods. *Seikai-san* performs the role of facilitators, raising the awareness of villagers to everyday problems. For example, *Seikai-san* introduced villagers to new and better ways of doing things, such as an improved model of a stove, but this would start with the women in the village becoming aware of the problems with their current stoves and then looking for improvements. It was not a case of just launching straight into the improvement of stoves.⁷¹ It is important to train facilitators who can help local residents become aware of the problems and then get the residents to find solutions themselves.

3) Field-oriented approach

The programs and activities undertaken during Japan's livelihood improvement movement were completely focused on what was actually happening on the ground. In this way, it is important to use a PDCA cycle or similar approach in extending cooperation, that is, investigate the present circumstances in the lives of farmers, and then as a result, repeatedly introduce improvements to any recognized problems. Japan is fortunate that there were no subsidy programs in place in its initial stages of development, because it gave form to the concept of *"kaizen,"* that is, using ingenuity to solve problems by utilizing things close at hand and without spending money.⁷² Though strengthening systems supporting administrations as described in 1) above is important, giving local residents ownership is equally important.

⁷⁰ Sato, Hiroshi (2001) p.150

⁷¹ JICA (2002e) p.5

⁷² JICA (2002e) p.7

Mid-Term Objective 3-8: Improving the health and education standard of rural residents

(1) Summary of concept

- 1) Scope of mid-term objective
 - Health: People living in rural areas can enjoy accessible health services, there is an environment in place that maintains the health of residents, and local residents acquire the basic knowledge and skills necessary to maintain their own health.
 - Education: People living in rural areas have equal access to basic education, and enjoy high-quality basic education.

2) Specific details of cooperation activities

- Health: Through cooperation with community organizations and community health volunteers, improve access to medical care for rural residents, and aim to improve community health. Examples of activities for maintaining the health of local residents includes the provision of basic knowledge through workshops, the development of water supply and sewerage systems, and the improvement of dwellings and barns.
- Education: Provide guidance in literacy and numeracy so that rural residents can understand farming manuals and instructions, and can record and utilize various agricultural data. One example is to provide education matched to the needs of the community to which rural residents belong, such as lessons on agricultural products and livestock breeding in accordance with the actual circumstances of the rural area, and lessons given in the native language of minority residents.

3) Connection with other mid-term objectives

This mid-term objective is related to Mid-Term Objective 3-8 "Gender in rural communities."

(2) Current state of JICA projects

Health:

- Technical Cooperation Project: (China) Village-Based Integrated Poverty Alleviation Model Project in Daozhen County and Leishan County, Guizhou Province (November 2005 to March 2010) One output of this project was to increase the use of high-quality family health services (reproductive health, maternal and child health, family planning, prevention of parasites, infectious disease prevention and treatment, etc.). Necessary activities were carried to achieve this output, including improvement of the service function, training, public relations and educational activities, physical checkups for children, and antenatal and perinatal medical examinations.
- Technical Cooperation Project: (Panama) Community Nutrition Improvement Project in Veraguas Province (November 2007 to October 2010)
 In partnership with the Ministry of Health and the Ministry of Agricultural Development, the aim of this project is to improve the nutritional status of people living in regional and rural areas through

increased agricultural productivity. Having conducted a study to confirm the nutritional state of people

living in the target villages as well as a participatory rural appraisal (PRA), training for extension workers was conducted to increase the accessibility to food, and training was provided for participating families and their children to learn the proper habits for improving nutritional intake.

• Loan Aid: (Philippines) Help For Catubig Agricultural Advancement Project (L/A signing date: May 30, 2001)

Drains are being improved and health and hygiene seminars are being conducted for local residents to combat schistosomiasis (snail fever), with an aim of not only improving agriculture infrastructure, especially irrigation facilities, but also to help improve health and hygiene in the target regions.

Education:

- Technical Cooperation for Development Planning: Study of Prevention for Desertification in the South Region of Segou in the Republic of Mali (July 2004 to January 2008) There have been examples of literacy education as part of improving resident participation at the village level and the project management capacity of residents, necessary for the implementation of projects.
- Technical Cooperation Project: (Myanmar) Project for the Eradication of Opium Poppy Cultivation and Poverty Reduction (April 2005 to March 2011) In addition to support for the cultivation of crops to replace opium poppies and the improvement of

agricultural technology, activities conducted in the pilot site focused on comprehensive initiatives for reducing poverty, including health, education and livelihood improvement.

Particularly in the area of health and education, support was provided for health and hygiene education delivered through school health, the eradication of parasites and development of toilets, and the management of literacy classes and school construction.

• Loan Aid: (Morocco) Rural Secondary Education Expansion Project (L/A signing date: March 31, 2004)

By constructing buildings at 101 lower secondary schools and providing materials and equipment in rural areas in five regions of Morocco, the aim of this project is to spread lower secondary education in the target regions and correct disparities between urban and rural areas and between boys and girls, thereby serving to improve the standard of living in rural areas. From among the 184 schools scattered all over the country, five regions were selected as having inadequately promoted education services on the basis of: (1) the diffusion rate of lower secondary schools in rural communes; (2) the enrollment ratio of students aged 12-14; and (3) the ratio of girls at rural lower secondary schools. The project consisted of constructing new school buildings and providing equipment at 101 lower secondary schools.

Regarding health and education, the *Thematic Guidelines on Poverty Reduction* (2009) describe the following approaches to poverty reduction: (Development objective 2) *Human capabilities (improving the*

basic ability to make a living), (Mid-term objective 2-1) *Improvement of educational level*, and (Mid-term objective 2-2) *Improvement of health condition*.

(3) Issues in implementing projects (common to health and education)

One of the common issues in conducting health and education activities necessary for providing cooperation in the field of agricultural and rural development is having to be mindful of: (1) the constraints of allocating resources to health and education in agricultural and rural development projects; (2) the complexity of cross-sector management; and (3) the difficulty in setting goals and measuring outputs. Furthermore, when conducting agricultural and rural development from the perspective of the farmer, rather than focusing only on agricultural development, it is important to improve the lives of farmers by also incorporating the essential areas of health and education.

(4) Points for concern in extending cooperation

Health: Lifestyles in rural communities are richly diverse compared to cities. Consequently, there is the problem of how each community views sickness, what are the conditions to which it refers, and what are the causes.

- (i) Through workshops and PRA, local residents and outside parties need to work together to identify what steps to take if someone seems sick and what effects it has.
- (ii) In some regions, folk remedies and traditional medicines are prevalent, and in others, customs remain deep-rooted which are hazardous to human health.⁷³ The lifestyles, cultures and customs characteristic to each region must be analyzed from a medical anthropological perspective from the start.
- (iii) Since sickness in a rural community is closely linked to social factors, any solution that is focused purely on the sickness will hardly be sustainable. An effective way of providing farmers with sustainable health benefits, is to promote a primary health care (PHC) strategy in conjunction with social development programs, such as for livelihood improvement and education, while also working to improve the health awareness of farmers.

Education: In promoting education in rural communities efficaciously, more effort should be put into non-formal education. In many cases, communities have traditional foundations for non-formal education, and education is greatly influenced by their cultural traditions.

- (i) When conducting education projects in rural communities, rather than starting from scratch, first, conduct a thorough survey of the educational resources in that community, and then make the best use of those resources. It is important, though, not to cause any extensive cultural friction against the cultural traditions of that land.⁷⁴
- (ii) The primary object of education in rural communities is not for promotion such as improvement in status. It is directly connected to the practical need for leading a better life. Consequently, incorporating the learning of life skills and other activities that will lead to increased income in

⁷³ However, since there are also useful folk remedies and traditional remedies, such as herb therapy, care needs to be taken in discriminating between different remedies.

⁷⁴ Chiba, Akihiro (2003) p.29

the education curriculum will result in increased motivation for people to undertake that education.

- (iii) It is also important to provide opportunities for people to utilize the skills they gain through education. Often, people who have gained reading and writing skills through literacy education end up forgetting the words and sums they learned because they have few opportunities to put those skills to use or to further strengthen them. Consequently, consideration also needs to be given to activities after the literacy education, such as establishing a library or publishing a newspaper, running income-generating programs, or conducting ongoing education like learning of life skills or training in specialized skills.
- (iv) Developing human resources to provide assistance for education projects in rural communities is also important. Education in rural communities in particular is directly connected to empowerment, bringing out people's potential capacities. Consequently, human resources are needed who understand about empowerment and communication. Many adults in rural communities are illiterate, and so *respect* and *patience* are needed for these people. Even though someone may not be able to write, they may lead a profound life and be rich in wisdom. More important than anything else is to have faith in this fact, and to have patience in eliciting their abilities and bolstering their confidence.⁷⁵

⁷⁵ Yuki, Tomoko (2003) p.20

Mid-Term Objective 3-9: Participatory rural development

(1) Summary of concept

1) Scope of mid-term objective

Achieve self-sustainable rural development, by bringing out the existing knowledge and technology inherent in local residents in an efficient and effective manner, and by improving and disseminating this knowledge and technology. Despite being centered on the participation of local residents, this is to be realized based on the decision making of various associated entities so that support can provided which is suited to the factors inherent in the local community.

It is important to recognize that, with participatory development, its scope diversifies according to the circumstances of project, and depending on "at whom," "for what purpose," "how," and "to what extent" resident participation is being encouraged.

2) Specific details of cooperation activities

Evaluations of local needs and the provision of services corresponding to those needs are usually conducted in an integrated manner. However, according to rural community surveys based on conventional questionnaires, an approach or technique for doing this effectively had not been achieved. Thus, efforts have been undertaken for various methods for collecting accurate information quickly. One method is the participatory rapid appraisal (PRA) technique of ascertaining the actual living conditions of rural residents by getting them to prepare the maps, selection rankings and harvest calendars, etc. for their own rural community, and the technique of outside parties efficiently collecting information relating to the social conditions of a rural community. Another method is participatory learning and action (PLA), which emphasizes the learning process of local participants. As mentioned in 1) above, since the techniques used vary depending on the purpose, care needs to be taken so as not to judge the relative merits of a technique based on normative "ought-to" theories.

3) Connection with other mid-term objectives

This mid-term objective is related to Mid-Term Objectives 1-6 "Agricultural financing," 3-1 "Promoting rural areas in response to decentralization," 3-5 "Promoting livelihood improvement" and 3-8 "Gender in rural communities."

(2) Current state of JICA projects

Projects conducted by JICA for participatory rural development can be broadly divided into those for the dissemination of agricultural technology and those for community development.

1) Dissemination of agricultural technology

This is a "means" for efficiently transferring specific technology or know-how to residents, such as agricultural technology or for maintenance of irrigation facilities. In addition to taking into account the needs and wishes of residents, in this case, residents take responsibility for some of the dissemination or maintenance activities. Moreover, the project outputs and end beneficiaries are often specified in

advance. An example of this is the Project for Capacity Development of Participatory Irrigation Management System through Viet Nam Institute for Water Resources Research for Improvement of Agricultural Productivity in Viet Nam (June 2005 to June 2010). This technical cooperation project produced a win-win-win situation for the parties concerned: farmers' incomes increased because of the managed terminal waterways \rightarrow farmers paid water charges and participated in maintenance activities \rightarrow water charges were used to improve the quality of services provided by irrigation corporations and agricultural cooperatives \rightarrow farmers' incomes increased further.

2) Community development

The aim of community development is to build the capacity of rural communities and residents to solve their own problems (empowerment), not just in agriculture, but in a broader sense. "Resident participation" processes, such as planning, implementation and monitoring, are recognized both as an effective "means" and "purpose" for rural development. Two typical examples from recent years are the Project for Participatory Village Development in Isolated Areas (June 2002 to December 2009) and its successor, the Rural Extension Service Capacity Advancement Project (December 2009 to December 2014; current). These two technical cooperation projects in Zambia focus on the learning process of residents repeating trial and error, and provide residents in advance with incentives to participate by making efficient use of external funds for livelihood improvement activities.

(3) Issues in implementing projects

1) Inadequate capacity assessment of beneficiaries for the purpose of considering what kind of participation is wanted

As mentioned above, in rural areas of developing countries, often there are no prospects for resources (personnel and budget) to provide administrative services, and so ensuring the potential for self-sustainable development centered on resident participation is an issue.

2) Difficulty in setting appropriate indicators and managing performance

Projects for participatory rural development with a focus on community development entail the extremely abstract concept of the "independence and empowerment of residents," and so setting indicators for project goals and outputs is difficult. Moreover, although participatory development attaches weight to actual processes, the project design matrix (PDM), which is used for managing the outputs of a project, is basically a tool for measuring the "degree of output achievement," and it is limited as a tool for understanding processes.

3) Ambiguous approaches to financing in resident-participation projects

In encouraging the participation of residents, it needs to be settled whether the project should be left to the self-reliance of residents wherever possible, or whether external capital should be provided to start with and then gradually shift the burden to residents.

4) Difficulty in training facilitators

Conducting participatory development requires people to perform the roles of "catalysts" or "facilitators." Using participatory techniques and tools unaided otherwise makes understanding the specific needs of local residents and fully eliciting their self-reliance difficult. Given the constraint of limited inputs, a further challenge in summarizing and organizing the wide-ranging needs and providing a definite direction is how to train human resources with abundant experience in rural community development.

5) Institutionalizing models

Many past projects for participatory rural development have been implemented first as a pilot case addressing a specific region or issue. Efforts have been made to turn these pilot cases into models and to institutionalize them (creating budgets, expanding nationwide, etc.), but the step of institutionalizing models requires ingenuity.

(4) Points for concern in extending cooperation

1) Understanding the capacity of local communities, and setting corresponding goals

For local governments with weak implementation systems, in order to implement participatory rural development more effectively, first, using rural community surveys and other means, ascertain the inherent factors⁷⁶ of the local administration, community and residents, and set goals appropriate for these factors, before selecting a resident-participatory approach for achieving these goals.

2) Organizing evaluation methods that include process evaluation

In evaluating participatory rural development, from a perspective of evaluation, it is inadequate to only use the "achievement of goals" based on the conventional PDM or the five evaluation criteria proposed by the DAC. There needs to be more extensive evaluation of processes so that the processes of resident participation can be fully confirmed, and an evaluation method needs to be established for measuring the impact against multiple yardsticks. For instance: How has the attitude and behavior of residents and the administration changed as a consequence of the resident-participatory approach? To what extent has capacity development progressed? Depending on the characteristics of the project, a possibility could be to try Kirkpatrick's four-level evaluation⁷⁷ or setting alternative quantitative indicators (for example: XX percent of residents reproduced the YY technology = Establishment of capacity).

3) Organizing the classifications of financing in resident-participation projects

One effective way of steadily fostering the self-reliance of local residents is the approach of refraining from external inputs as much as possible. In this case, following the advice of external parties, first incorporate components likely to produce benefits in a relatively short period of time for small groups of resident participants, such as the better use of local resources, and allow the residents to experience personally the merits of participatory development. Then, while maintenance may be time-consuming,

⁷⁶ Sato (1995)

⁷⁷ Four levels used in evaluating training programs: 1. Satisfaction (of participants), 2. Degree of understanding, 3. Behavior on the job, 4. Contribution to performance. For further details, see the summary v of the *Handbook for Selecting Outcome Indicators: A Guide to Practical Evaluation of Technical Cooperation* (2005).

consideration can be given to the step of establishing and engendering activities in the medium and long term which, maybe time-consuming but, have considerable shared benefits to participants.

4) Training facilitators

Prior to implementing cooperation, the monitoring function is emphasized as the role of an external party.⁷⁸ For this reason, gaining a full understanding of the capacity of the people involved, through an assessment of the residents/administration and of the purpose and method of introducing resident participation, becomes a prerequisite for adopting the resident-participatory approach. In addition, it is necessary for a facilitator to spend some time working closely with the local community and building up experience in rural community development, and to develop an "attitude and approach of interacting with local residents," as well as the ability of carefully taking on board their needs.

5) Program-by-program approach

In order for external parties to intervene effectively in the long resident-based development process, it is essential that the approach be suited to the inherent conditions of the local community. On the other hand, it is also necessary to collaborate with the recipient government in giving full consideration to a scenario (program) with a view to institutionalization in the medium and long term, and to define the direction of the program in advance.

6) Community organization

In projects for participatory rural development, community-based organizations are often formed as a means of encouraging resident participation efficiently and fairly, and as a forum for the learning process for empowerment. In general, using existing organizations or decision-making mechanisms is efficient and effective. In cases where it is unavoidable that the formation of a new organization be promoted by an outside party in order to achieve the project goals, generally speaking, the organization will be weak and lack sustainability unless there is sufficient social preparation and support for monitoring the organization process. However, in reality, in a limited period of cooperation, completing social preparation before proceeding to the next step is both difficult and entails a strong possibility that, during this time, the willingness of residents to participate will diminish. Adjustments need to be made for this divergence between theory and practicality once those involved have clarified the objectives and constraints.

⁷⁸ Yoshida and Asada (2008)

Mid-Term Objective 3-10: Gender in rural communities

(1) Summary of concept

1) Scope of mid-term objective

It is said that there are 1.3 billion poor people living in the world, and approximately three quarters of these live in rural areas and rely on agriculture to make a living. Moreover, females account for approximately 70 percent of the poor.⁷⁹ In addition, in developing countries, more than half the people engaged in agriculture are female, producing two thirds of the food. In order to improve the poverty situation in rural areas, gender equality and the empowerment of women need to be promoted,⁸⁰ and sustainable agricultural and rural development needs to be facilitated.

This objective also covers support for people in socially disadvantaged circumstances.

2) Specific details of cooperation activities

From the perspective of gender,⁸¹ clarify the development issues and needs, and plan, implement, monitor and evaluate development policies, measures and programs.

3) Connection with other mid-term objectives

All agricultural and rural development activities need to be conducted from a gender perspective. In other words, this objective is connected with all other mid-term objectives.

(2) Current state of JICA projects

1) Gender integrated projects⁸² in the field of agricultural and rural development

• Technical Cooperation Project: (Tanzania) Technical Cooperation in Supporting Service Delivery Systems of Irrigated Agriculture (Tanrice) (2007 to 2012)

A gender survey was conducted at the time of the ex-ante evaluation study, and gender perspectives were incorporated into activities. Short-term experts in gender issues were dispatched every year to support the preparation of curricula for general training as well as for training and dialogue programs. Training materials have been completed for training in family budgeting and in gender awareness.⁸³ In fiscal 2011, a gender impact study was conducted. These results have carried on from the outputs of the gender activities conducted at the Kilimanjaro Agricultural Training Center (KATC Phase II) (October 2001 to September 2006). Short-term gender experts were also dispatched and efforts undertaken for gender mainstreaming as part of this project, too.

⁷⁹ UNDP (1997) Poverty and Human Development, Human Development Report 1997, p. 8; United Nations Development Program (1995) p.5

⁸⁰ Advocated in the United Nations Millennium Declaration, which was adopted at the UN Millennium Summit in 2000

⁸¹ The term "gender" (social gender gap) is the difference between males and females defined according to the values and norms of a region and time. It refers to the roles of males and females, the qualities of masculinity and femininity and the correlation between males and females, which are created by society or culture.

⁸² JICA divides all projects into three categories: (1) Gender equality projects, (2) Projects targeting women, and (3) Gender integrated projects. (Source: (JICA) Development Issues Division (Planning Department) and Gender Equality Division (Public Policy Department) FY2008 Annual Report on the Promotion of Gender Mainstreaming, p.4)

⁸³ Teaching aids prepared by Yoko Harada (short-term expert, 2010)

• Technical Cooperation Project: (Kenya) Smallholder Horticulture Empowerment Project (November 2006 to November 2009)

A gender survey was conducted at the time of the baseline survey, confirming the differences in needs and problem awareness between men and women in the target farmer groups. These results were reflected in the activity plan. Gender mainstreaming in agricultural management was undertaken using a method of creating a six-level assessment for the three categories of leadership, member cooperative structure and gender, as unique empowerment indicators for measuring the capacity building of farmer groups, and then only moving on to the next level when all goals for each of the three categories for the current level had been attained. Short-term experts in gender issues were also dispatched.

• Technical Cooperation Project: (Laos) Aquaculture Improvement and Extension Project Phase II (April 2005 to April 2010)

This project actively encouraged the participation of women in rural areas. As a result, group aquaculture was carried out properly, and the female participants were to become socially empowered. Examples were also seen where women's groups contrived to raise common funds from aquaculture or seed and seedling production, which was set aside to fund mutual aid when required, such as when one of the members gave birth to a child or fell ill.

- 2) Education projects aimed at gender in rural communities
 - Loan Aid: (Morocco) Rural Secondary Education Expansion Project (L/A signing date: March 31, 2004)

By constructing buildings at 101 lower secondary schools and providing materials and equipment in rural areas in five regions of Morocco, the aim of this project is to spread lower secondary education in the target regions and correct disparities between urban and rural areas and between boys and girls, thereby serving to improve the standard of living in rural areas. From among the 184 schools scattered all over the country, five regions were selected as having inadequately promoted education services on the basis of: (1) the diffusion rate of lower secondary schools in rural communes; (2) the enrollment rate of students aged 12-14; and (3) the ratio of girls at rural lower secondary schools. The project consisted of constructing new school buildings and providing equipment at 101 lower secondary schools.

Technical Cooperation Project: (Yemen) Broadening Regional Initiative for Developing Girls' Education Project (BRIDGE) (2005 to 2008)
 Yemen has the widest gender gap in the world when it comes to accessing basic education. The overall gross enrollment rate⁸⁴ for children at the primary level (grades one to six) is 67 percent, whereas it is only 47 percent for girls. The overall adult literacy rate is 49 percent, whereas it is only 28 percent for women. In 2002, Yemen established a ten-year national plan called the Basic

⁸⁴ "Gross enrollment rate" is the ratio of students enrolled, including students not in the grade-level age group, to the school age population. "Net enrollment rate" is the ratio of students enrolled, who are of relevant age, to the school age population.

Education Development Strategy (BEDS). One of the goals of this plan was to provide high-quality basic education to all children aged six to fourteen by 2015. Since then, the country has promoted expansion of basic education (in particular, to rectify the gender imbalance). Since 2002, as administration has become progressively decentralized, the emphasis has been on capacity building for schools to manage themselves and on furthering community participation in school management. However, given the inadequate planning capacity of administrative officers of local governments (governorates and districts) in charge of education, the inadequate management capacity of school officials (principals, teachers, etc.) and the inadequate community participation in education, this project was implemented for the purpose of improving this situation. BRIDGE Phase II has been implemented since 2009.

3) Support for internally displaced people and indigenous people

Technical Cooperation Project: (Colombia) Improvement of the Nutritional Condition of the Vulnerable People Including Internal Displaced People through Urban Agriculture Strengthening Project (June 2006 to May 2009)
The objective of this project is to improve the nutritional intake of the socially disadvantaged in San Cristóbal, including internally displaced persons, through the enhancement of urban agriculture. The project is comprised of: (1) capacity building in urban agriculture at the Bogotá Botanical Garden;
(2) capacity building in urban agriculture for local residents and community-based organizations; and
(3) urban agricultural extension projects run by organizations involved in the nutritional improvement of residents.

• Technical Cooperation Project: (Panama) Community Nutrition Improvement Project in Veraguas Province (November 2007 to October 2010)

Panama is a country with vast internal social and economic disparities, and its rural communities face severe poverty problems. (The poverty rate in urban areas is about 20 percent, whereas it is as much as about 63 percent in rural areas.) Approximately three fifths of the country lies in mountainous regions. In rural villages, there are many small farmers who are less than self-sufficient, tilling fields with poor soil. For this reason, local residents are susceptible to malnutrition. Nutritional conditions in Panama's poorer areas correlates to the differences in food availability and accessibility between the harvest season and wet season (roughly April to December) and the dry season (roughly January to March). When food shortages are at their worst, securing food is a considerable challenge. The aim of this project was to improve the nutritional conditions in poor rural areas, especially for women, through the cultivation, cooking and processing of crops of high nutrition value and through the enhancement of community-based organizations.

• Technical Cooperation Project: (Ecuador) Capacity Development for Promoting the Sustainable Integral Rural Development for Poverty Reduction in Chimborazo Province (February 2009 to August 2011)

The objective of this project is to implement programs aimed at reducing poverty in Chimborazo Province, which is home to many indigenous people. The project is comprised of: (1) strengthening the capacity of the provincial government, relevant agencies and related organizations to analyze problems in relation to sustainable integral rural development; (2) strengthen their capacity to

formulate and plan programs; and (3) strengthen their capacity to implement and manage programs.

(3) Issues in implementing projects

Women living in rural areas in developing countries are faced with the following kinds of constraints, and providing support to overcome those constraints is a challenge. Some constraints are rooted in social structure, systems and convention, and solving these issues will take a long time, but some can be transformed in the short-term by taking advantage of people's "awareness."

- Women play three roles in life (women's triple burden): agricultural production labor, reproduction activities (housework, collecting firewood, drawing water, etc.), and local community activities. Regardless that women make a considerable contribution to the family budget, often, men undertake management of the family budget and have a stronger voice when it comes to the allocation of resources within the household.
- Women tend to be restricted from participating in training on agricultural extension and agricultural technology, and from participating in decision-making processes within the local community, such as in village committees and agricultural/irrigation associations. There are also few female agricultural extension workers.
- The role played by women in economic activity is undervalued, and the wage disparity between men and women is considerable. Furthermore, only work for which a salary or wage is paid is counted in national censuses and surveys of family income and expenditure. Informal economic activity and subsistence production, for which women make a considerable contribution, are not included in the statistics.
- Women have limited access to marketing information due to such factors as their low level of education and living conditions. Women are disadvantaged in terms of economic activity, such as being unable to obtain a loan from a bank.
- Despite constitutional provisions for rights to gender equality, often women's rights are not guaranteed in civil law or common law. For example, when it comes to divorce and inheritance, in many cases, women's property rights are not equally guaranteed. Moreover, land is generally held in the name of men.

Thus, women in developing countries are often placed at a disadvantage socially, economically, legally and institutionally—a factor which inhibits the sustainable development of rural communities.⁸⁵ As a consequence, development projects need to be planned and implemented which given consideration to improving the circumstances in which women are placed.⁸⁶

In particular, the *Thematic Guidelines on Gender and Development* (November 2009)⁸⁷ list the following as key gender issues in agricultural and rural development.⁸⁸

- (i) Women undertake more farmwork than men.
- (ii) Women in rural areas are particularly busy, working very long hours.
- (iii) In many regions, women do not have the right to own land.
- (iv) In rural areas, women account for an increasing percentage of people living in poverty.
- (v) Women are not receiving enough services, such as agricultural extension services.

⁸⁵ For example, the low literacy rate and enrollment rate for women play a part in why it is difficult to implement population planning, health improvement plans and projects for the dissemination of various technologies. A lack of hygiene knowledge and poor nutritional conditions are thought to lead to high morbidity rates and to high maternal mortality rates. (JICA (1993) p.1)

⁸⁶ JICA (1993) p.1

⁸⁷ http://knowledge.jica.go.jp/km/FSubject1501.nsf/fb3f33f4fe596c6149256b91001bf56c/44ff0a86b92b312d4925768c00037 2b7?Open Document

⁸⁸ Japan International Cooperation Agency, Public Policy Department/Gender and Development Task Force (November 2009) *Thematic Guidelines on Gender and Development*, p. 90-92

- (vi) Women are not participating in the running of community-based organizations and producer organizations.
- (vii) The wisdom possessed by women is not being used effectively.
- (viii) Gender perspectives have not been incorporated in agricultural policies.

(4) Points for concern in extending cooperation

When providing cooperation for agricultural and rural development, it is important that the following five gender perspectives be included in the project activities.⁸⁹ For further details on gender perspectives, reference should be made to *Thematic Guidelines on Gender and Development* (November 2009). Preparations need to be made and training provided so that all experts and consultants engaged in the project can deepen their understanding about gender issues. Holding discussions as circumstances demand with the sections responsible for gender-related matters and with senior advisors in gender issues is effective for this purpose. Gender impacts and initiatives taken from gender perspectives must be reviewed and variations in output continually specified, not only at the project formulation stage, but also at the time of project consultation, mid-term review and terminal evaluation. For this purpose, gender issues need to have been integrated into the PDM outputs or activities, and indicators also need to be prepared based on the gender perspectives.

1) Reduction in labor burden for women

By reducing the overwork performed by women, they will get an opportunity to participate more actively in social and economic activity. This requires the understanding of the local community, including family members, as well as measures leading to spare time. To this end, it is imperative that men recognize the current situation in which women have been placed, and that they cooperate in lightening the workload of women.⁹⁰ Consideration can be given to dispatching short-term experts in gender issues and providing support at each key point in the project, such as at the preparation stage, when holding awareness-raising workshops for counterparts and local residents, as well as at the mid-term review and terminal evaluation, such as via incidental components to technical cooperation projects and yen loans.

2) Creation of income by women

In improving the livelihoods of women in rural areas, it is important to first allocate resources fairly within the household. Women also need to have the right to manage and make decisions about how revenue earned from farmwork is to be used. In addition, it is important that women have economic power.⁹¹ By women participating in economic activity, not only will the social valuation of their activity rise because of their remuneration, but by having income at their own disposal, the degree of

⁸⁹ JICA (1993), JICA (1999c) p.32

⁹⁰ There have been cases where, by reviewing the mechanism by which roles are divided between men and women, working together has provided a stimulus to both genders. For example: Project for Traditional Irrigation in Tanzania (JICA (1999c) p.78).

⁹¹ Revenue earned by women is often used for the family, and in particular, for the children (JICA (1999c) p.33). It has also been reported that the levels of child nutrition and education have increased (World Bank (2002) p.212).

their autonomy within the household and society will also increase. The creation of income by women leads to improved livelihoods for residents as well as an improvement in the status of women. Income creation activities for women need to be incorporated into the components of technical cooperation projects, technical support needs to be planned, and this also needs to be clearly stated in the PDM. Furthermore, with the recent rapid spread of mobile phones in the rural areas of developing countries, thought could also be given to trialing income security for women through the introduction of mobile money (mobile banking) via mobile phones. As for financial aid, also consider providing support for business startups to women who have a strong sense of duty to collective responsibility, via unsecured two-step loans, by supporting rural banks and other lenders in building their capacity for loan screening. However, given the current situation where women are responsible for unpaid labor, such as housework and child rearing, it is important to deepen men's understanding of gender so that promoting the above activities does not further burden women.

3) Social participation of women (right to speak, right to make decisions, access to and control of resources, etc.)

Women need to participate in the decision-making processes of local communities. At the same time as participating and voicing opinions in project activities, women also need to work together with men as leaders and promoters in the local community. It is important that male and female residents understand that building relationships of gender equality is crucial for realizing better agricultural and rural development. Furthermore, ingenuity is also needed to allow both men and women to learn agricultural technology, such as gaining the understanding of local influential people, or establishing quota for male and female participants in training.⁹² If economic benefit can actually be generated through the empowerment of women, local understanding will be promoted, and opportunities for women to participate in society will increase. This is also an essential element for poverty reduction.

4) Use of gender experts

In Japan, the number of gender experts is small compared to other sectors, but it is on the rise. When providing technical cooperation or financial aid, short-term gender experts should be dispatched at the preparation stage, and long-term experts should be dispatched even if holding another position concurrently. It is also effective to utilize local resources (female researchers, NGOs, etc.) who understand the complex social and cultural structures of the local area, and getting them to identify the country's national plans on gender and development, government policies in the agricultural sector, the socio-economic conditions of the target region (gender roles and needs, authority held by men and women, etc.), gender norms and taboos, etc., as well as getting them to conduct gender awareness training and gender audits as required. It is effective then to use this gender information in building mechanisms for successfully reducing the burden borne by women in the target region and improving their economic and social status. (Also utilize JICA country gender profiles.)

⁹² Japan International Cooperation Agency, Public Policy Department/Gender and Development Task Force (November 2009) *Thematic Guidelines on Gender and Development*, p.94

5) Response to socially disadvantaged people

In developing countries, gender is not the only factor on which prejudices and disparities are based. Others include class, caste, race (ethnicity), age and disability, and some people are socially excluded because of these. Setting quotas for training participants and committee members⁹³ will lead to effective cooperation in response to these kinds of social exclusion issues, as will incorporating into project activities diverse genetic resources, which are suited to local conditions and which have traditionally been used by the indigenous people, as well as knowledge and experience in farming techniques that utilize these resources. Given the social sensitivity of these issues, any initiatives need to be addressed in full consultation with the residents of the relevant community.

⁹³ This is also called "affirmative action" and "quota system."

Attached Materials

- 1. Definition of Terms
- 2. Changes in issue-specific projects in agriculture
- 3. References/Bibliography/Websites

1. Definition of Terms

Agriculture

In a broad sense, the word "agriculture" includes forestry and, at times, fisheries as well. In these Guidelines, however, it is defined as a limited primary industry centering around the sub-sectors of crop farming and livestock farming. Crop farming is the industry of growing useful plants such as grain, vegetables and garden products by tilling land. Livestock farming is the industry of obtaining daily necessities like milk, meat, eggs and furs by keeping livestock and poultry and by producing fodder and feeding it to them.

Rural area

This is a concept that is used in contrast with urban spaces. In reality, however, the use of this term differs very widely from country to country and from region to region. Generally, it is understood to refer to areas where many residents are engaged in agriculture in a broad sense. However, in these Guidelines, the term is used as a concept of social, economic and natural conditions relative to that of cities in each country and region.

Agricultural development

This refers to the development of living things and production environments, whose main purpose is bio-production and an increase in bio-production, regarding people, land and capital as either resources or means of production. Agricultural development includes not only support activities directly involved in the production of agricultural goods but also a wide range of other activities related to the production and supply of food. Among them are research and development of technology, improvement of agricultural promotion systems and infrastructures, market distribution, agriculture-related legal systems and agricultural policy.

Rural development

In these Guidelines, "rural development" refers to the development of rural areas, including not only agriculture and agriculture-related industries as a primary means of earning a living, but also, more broadly, healthcare and sanitation, education, environment, social infrastructure improvement and empowerment of community members.⁹⁴ However, healthcare, sanitation and education will be discussed only in connection with the characteristics they show in rural areas since separate thematic guidelines have been established.

Poverty

In JICA's *Thematic Guidelines on Poverty Reduction* (2002c), poverty is defined as "a condition where the people are deprived of opportunities to manifest their capabilities to have the basic human life, and in addition, where the people are excluded from the society and development process."⁹⁵ The guidelines also define the "poor," who are the recipients of the cooperation, as referring to those people whose income or expenditure necessary to purchase minimum necessities for living is at or below a certain level set according to the

⁹⁴ In recent years, the term "rural development" has also been used to refer to a more limited range of actions including, in particular, development primarily aimed at the sustainable livelihood improvement for the poor or an approach targeting the development of poor rural areas. This is because the poor in rural areas, or the increasing poverty in those areas, has become regarded as an important development issue.

⁹⁵ JICA (2002c) p.10

circumstances of that country (poverty line).⁹⁶

Hunger and undernourished population

Hunger means "to starve because of lack of food" (the Dai Jirin Dictionary, Second Edition). The FAO defines the undernourished population as the number of people whose intake of calories from food is below the standard calculated for each country or race to enable them to maintain a certain body weight when they undertake a certain amount of labor.⁹⁷ It is used as an index for reducing the number of undernourished people in hunger eradication efforts.^{98, 99}

Food security

"Consider measures and quick response actions for securing a food supply in instances it is affected by some unpredictable factor, and make preparations on a day-to-day basis in case of emergency." (Ministry of Agriculture, Forestry and Fisheries of Japan website <u>http://www.maff.go.jp/j/zyukyu/anpo/1.html</u>) The Plan of Action of the World Food Summit stipulates that "Food security exists when all people, at all times,

have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."¹⁰⁰

Integrated rural development

"Integrated Rural Development" is an approach which was first proposed in the 1970s, the basic philosophy of which is to implement sector projects needed for the development of rural areas in an integrated manner. In these Guidelines, the approach is to implement projects in the *agricultural* sector, as well as in the *health* and *education* sectors (which are basic human needs (BHN) sectors) in an integrated manner.

Participatory rural development

An approach in which residents identify the problems facing their local community, consider solution strategies for addressing these problems, and then formulate, implement and monitor corresponding action plans.

Livelihood improvement approach

The "livelihood improvement movement" was a national movement organized in Japan after World War II to improve livelihoods in rural areas, and was led by *livelihood improvement extension workers* and by the movement's beneficiaries, namely, the actual farming families. Based on this movement, the "livelihood

⁹⁶ For further details on poverty and poverty reduction, see JICA (2009c).

⁹⁷ FAO (2002a)

⁹⁸ For example, the Rome Declaration issued at the World Food Summit held in 1996 (FAO 1996a), states: "We pledge our political will and our common and national commitment to achieving food security for all and to an ongoing effort to eradicate <u>hunger</u> in all countries, with an immediate view to reducing the <u>number of undernourished people</u> to half their present level no later than 2015."

⁹⁹ While starvation as indicated by the number of undernourished people mainly represents a chronic condition, hunger means a shortage of food resulting from a temporary but extremely poor harvest.

¹⁰⁰ FAO (1996b) Paragraph 1

improvement approach" involves uncovering everyday problems in the lives of farming families, and encouraging their self-reliant efforts to solve the problems.

Capacity development (CD)

Capacity development is a process where the problem-solving capacity of a developing country improves at various levels, including individuals, organizations and society, when viewed as a whole. CD differs from capacity building (CB) in that: it looks at capacity improvements in systems, policies and social systems, not just organizations and individuals; it is an intrinsic process without any outside intervention; and it looks at "strengthening" and "maintenance" in addition to "building."

Integrated pest management (IPM)

A method of reducing damage from disease and harmful insects to levels that are economically negligible, by using biological control, physical control and husbandry control in an appropriate and efficient manner.

Organic agriculture

Agriculture in which natural resources are used effectively, and which is aimed at improving profitability through reduced input costs and at ensuring sustainability by maintaining and improving soil fertility. It also pursues product differentiation and new forms of distribution by virtue of being "organic."

Master plan

It refers to an integrated national or regional development plan, or a long-term sector-specific development plan.

Sustainable rural development (sustainable rural community development)

It refers to the development of rural areas which satisfies the wants of the current generation, while also satisfying those of future generations. Specifically, it covers a variety of initiatives, including not only agriculture and agriculture-related industries as a primary means of earning a living, but also, more broadly, healthcare and sanitation, education, environment, social infrastructure improvement and community empowerment.

Farmers schools

It is the technique of gathering several farmers to a demonstration farm, and transferring technology while promoting activities together.

Farmer-to-farmer dissemination

It refers to technology spreading from farmer to farmer. There are two types of transfer: the "ripple" type, where technology is transferred naturally without any planning or design; and the "dissemination" type, where

technology is transferred in a systematic manner.

Agriculture based on the use of local resources

This is an attempt for sustainable agriculture that achieves a certain degree of productivity with few inputs, by effectively utilizing the soil, water and biological resources that exist locally to improve the production efficiency of the agro-ecosystem, without relying excessively on external resources.

2. Changes in issue-specific projects in agriculture

Scheme		Year	Agrarian reform	Food and agricultural statistics	Development planning	Organizational and institutional reform	Development of legal systems, policy planning	Improvement of farmland	Development of farmland (new)	Conservation of farmland	Irrigation and drainage	Water management (including irrigation associations)	Agricultural machinery	Other production facilities	Biotechnology (technological development)	Breeding (technolog ical development)	Cultivation (technological development)	Soil (technological development)	Pest control (technological development)	Other (technological development)	Strengthening of national organizations (dissemination)	Strengthening of regional organizations (dissemination)	Strengthening of agricultural organizations (dissemination)	Farmer-to-farmer dissemination (dissemination)	Agricultural education (dissemination)	Improving farm management (dissemination)	Agricultural financing	Materials (seeds, fertilizer, agrochemicals)	Plant genetic resources	Environmental protection-style agriculture	Water harvesting	L ivestock production (animal husbandry)	Livestock hygiene (animal husbandry)	Livestock processing (animat husbandry)	Market development	Marketing	Immrovement of must made	Water sumply and drainage	water supply and dramage Electrification and other	Intrastucture Integrated rural development	Creation of special growing districts	One Village One Product (OVOP)	Participatory rural development	Agricultural processing	Commodity loans	Construction of centers	Aid for increased food production: Agricultural materials	Aid for increased food production: Other	Aid for increased food production: Agricultural equipment	Food aid	Total	Number of projects	
Developmer study	Global total		E						4	2			E	E												-	- 2		-	14	1		-	-	-	N	4	1	-	7								-			100	E	19191
Technical cooperation project	Global total								-															-				18	- 1	400	-		100		-	12	1		1		1								_		11004	E	10014
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Grant aid	Global total	1212							1											1						_			1	2			2	1	-	1	2		-	2							10 H H H H	-	198 174 68	15 56 100	1		10111





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