

**Community Based Socio-Economic Development Planning in
Irrigation Projects in India:
Strategic Approaches in JBIC Assisted Projects**

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Community Based Socio-Economic Development Planning in Irrigation Projects in India: Strategic Approaches in JBIC Assisted Projects

Deepak Kumar Das*

Abstract

The last two decades have witnessed a paradigm shift in management of irrigation system away from fully bureaucratic control towards approaches in which users play a much more active role. Community based micro planning focuses more on decision making and operational details of achieving specified plan target. Japan is one of the important bilateral partners of India contributing to its economic development in a significant way. Japan Bank for International Co-operation (JBIC), Japan International Co-operation Agency (JICA) are the major Japanese agencies supporting Japan's Official Development Assistance (ODA) to India, the first and the largest recipient country of Japanese ODA in the world. The important assisted sectors are energy; conservation, protection and development of environment and natural resources; trade, transportation, agriculture and rural development, health, support for other economic development and exchange of technology etc. The JBIC assistance for irrigation sector in India amounts to 56 billion yen (3% of total JBIC Assistance) and it covers 8 projects in four less developed states of India. This paper presents how these projects funding not only aims at the development of irrigation infrastructure but also targets at its sustainability with community based micro level planning and implementation strategy along with Entry Point Activities to ensure food security and socio-economic upliftment of the poor farmers within the irrigation commands.

1. Introduction

India is the second largest populated country in the world with nearly 1.1 billion people. Out of this around 26.1 per cent are poor, living with less than a dollar a day (ADB 2004; UNDP 2003). The country is thus home to more than one-fourth of the world's poor. Further the degree of poverty varies from state to state. The poverty estimate in percent of population below poverty line is as high as 47.15 per cent for Orissa and 42.6 per cent for Bihar to lower values 3.5 per cent for Jammu and Kashmir and 4.4 per cent for Goa during 1999-2000 as reported in National Human Development Report 2001 of Govt. of India (Planning Commission, 2002). Poverty alleviation is the most important objective of Indian planning through creation of employment opportunities, income generation activities and growth promotion. However, underdeveloped infrastructure, such as power, transport, irrigation, water supply, sewerage, and lack of accessibility to health facilities, have impaired economic growth and the poverty eradication drive. At the same time, environmental problems are also worsening in India, while the forest area is shrinking day by day and at the same time urbanization is increasingly causing river water contamination and air pollution. In the 10th

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Five Year Plan (April 2002-March 2007), the Government of India called for equitable and sustainable growth, and to achieve this goal, it has designated the following as the priority development issues: not only eradication of the existing poverty but long-term poverty reduction through economic growth and environmental conservation to make these efforts sustainable.

Water resources management and development are central to sustainable agricultural growth and poverty reduction. Currently, integrated water resources management is highly emphasized for enhancing food security, poverty eradication, economic growth and rural upliftment in the developing countries including India. Further, most of the developing countries have insufficient hydraulic infrastructure and hence, the governments, international funding agencies need to assist these countries in developing and maintaining adequate number of well-performing hydraulic structures and in mobilizing public and private financing, while meeting environmental and social standards. Moreover, the below-optimal performance of the existing irrigation systems is of serious concern to farmers who depend on them for their crops and livelihoods and to governments as well as funding agencies that have made massive investment in their development. The most severe problems encountered by irrigation systems in the developing countries are the increasing costs of new schemes, the huge backlog of incomplete schemes, and the increasing neglect of existing systems. Large-scale canal irrigation systems, in particular, are in poor condition: they are not properly maintained, operations are inadequate, water supplies do not reach the end of systems, and the timing of water supply is unreliable. The wide gap between actual and desirable performance threatens the sustainability of irrigated agriculture. This state of affairs warrants proper investment strategies with institutional reforms and comprehensive plans for implementation starting from Micro-level (Grass-root level).

It is established that in democratic and developing countries like India, genuinely participatory governance of a common property resource like irrigation at the micro level can yield benefits in terms of both efficiency and equity, by giving the water users a sense of ownership, by allocating resources according to people's demand and need and by utilising their skills and knowledge. The reform or decentralisation of governance of irrigation infrastructure or Irrigation Management Transfer to Farmers' Organisations is now widely accepted and used as an effective tool for improving management efficiency, accountability, agricultural and economic productivity and cost recovery and finally sustainable irrigated agriculture. As a result, it is now observed that an increasing number of governments around the world are adopting programmes to devolve responsibility for irrigation management to farmers' organisations or to Water Users Associations (WUAs) in their reform process, which is known as Participatory Irrigation Management (PIM) and is found place in their national policies. Indian irrigation sector in recent years is also in the same PIM trail where attempts are being made to increase farmers' direct participation in decision-making and investment.

Further, conventionally Indian agriculture is largely based on rural villages, as it draws most of its inputs from farms and village industries. Consequently, it establishes the fact that transforming agriculture to effective enterprise or industrialization of agriculture has potential to provide the rural poor with on-farm and off-farm employment, induce economic growth and promote food security. On the other hand, studies of De Boer et. al. (1997), Simons and Supri (1999), White (1999) and Grossmann and Poston (2003) reveal that India's agriculture extension system has missing links to secondary or primary education and is not reaching effectively to the women and the rural poor including the lower castes. Though India is one of the potential producers of large number of agricultural researchers and scientists but it lacks in providing basic skills required to improve farming methods or job opportunities in the rural off- farm sector. Now high priority should be given to equip the rural poor with appropriate skills by improving the currently inadequate agriculture extension system. The situation altogether warrants a comprehensive micro plan with reforms in irrigation governance.

2. Irrigation Development through JBIC Assistance in India

Japan is one of the important bilateral partners of India, which is contributing to its economic development in a significant way. Currently India is supported by Japan's Official Development Assistance (ODA) through the agencies like Japan Bank for International Cooperation (JBIC), Japan International Co-operation Agency (JICA) and other Japanese agencies. JBIC Operates on two fronts to implement Japan's economic policy and international economic cooperation. One is Overseas Economic Cooperation Operation (OEEO) which provides financial assistance including ODA loans and the other is International Financial Operations (IFO), which includes Export Import loans, overseas investment loan etc. India is the first recipient country of Japanese ODA loan in 1958 and today is the largest recipient country of JBIC assistance in the world. The important assisted sectors are energy, forestry, water and sanitation, transportation, agriculture and rural development, health, conservation and protection of natural resources, environment, grassroots level organizations, promotion of trade and exchange of technology etc. According to the Foreign Ministry of Japan's "ODA Country Policy toward India," the priority areas of assistance to India are (1) upgrading of economic infrastructure, (2) alleviation of poverty, and (3) environmental conservation.

JBIC's Country Strategy Paper notes the following identified implementation priority areas of economic assistance: maintaining and upgrading the economic infrastructure, including electric power and transportation; regional development to aid the poor; and environmental improvements, especially in urban areas where the environmental or sanitary conditions have markedly deteriorated. As well, other positive efforts include intellectual assistance in formulating public policy, and support in the areas of human resources training and health care. One of the priority items to be implemented for poverty alleviation and rural upliftment includes the following (JBIC 2003d, 2005a).

- (1) Aid to the poor (industrial development, including agricultural and rural development)
 - (a) Support each state government's efforts to reform and eliminate bottlenecks, thereby facilitating economic growth
 - (b) Promote industrial development, including agricultural and rural development, in order to assist the poor
 - (c) Promote agricultural development by
 - Agricultural productivity improvement through irrigation
 - Employment opportunity creation through diversifying agriculture
 - Regional development by maintaining and upgrading tourism foundations
 - Measures to improve income through micro-finance
 - Rural infrastructure upgrades, such as roads, to improve access to markets and product distribution
 - Measures to improve incomes of the rural poor
 - Support for education and health

To accomplish above objectives JBIC in India has a up-to-date cumulative ODA commitment amounting to JPY 2,336 billion (approx. USD 22.5 billion or Rs. 93,440 crores), out of which share for development of irrigation sector in India amounts to 56 billion yen (3% of total JBIC Assistance) and it covers 8 projects. The details of state-wise and sector-wise distribution of ODA loan is given in Figure 1 and Figure 2 (Kato and Singh, 2005). In the irrigation sector the projects include Rajasthan Minor Irrigation Improvement Project (Rajasthan), Rajghat Canal Irrigation Project (Madhya Pradesh), Rengali Irrigation Project (Orissa), Upper Kolab Irrigation Project (Orissa), Upper Indravati Irrigation Project (Orissa), Kurnool-Cuddapah Canal Modernization Project (Andhra Pradesh). The salient features of some the projects are as follows.

Figure 1: State-wise Distribution of Japanese ODA Loans (as on March, 2004)

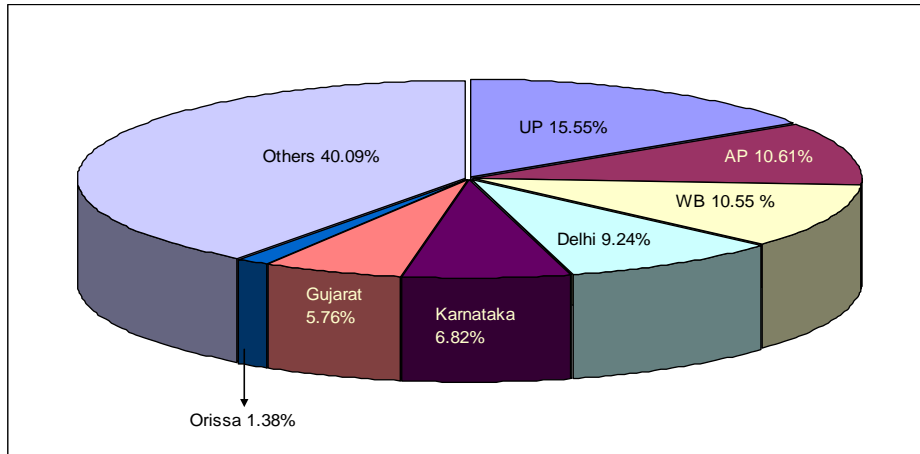
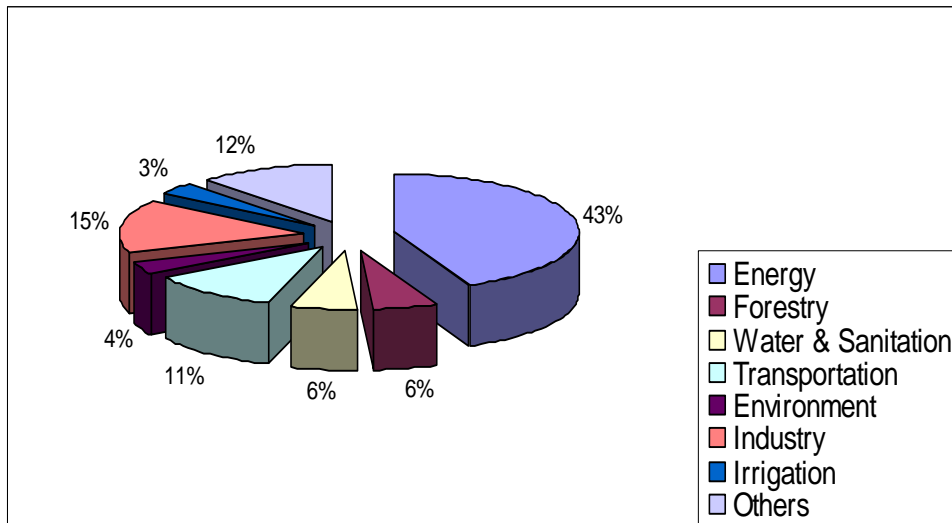


Figure 2: Sector-wise Japanese ODA Loans in India (as on March 2004)



2.1 Rajasthan Minor Irrigation Project

The project aims at increasing agricultural output by rehabilitating existing minor irrigation facilities in the state of Rajasthan in western India, where rainfall is extremely scarce, compelling the farmers to resort to irrigation facilities for agriculture. The main features of the project are physical improvement which includes rehabilitation, renovation, and up-gradation of tanks and distribution system of identified minor irrigation schemes; technical and institutional supports in the aspects of agriculture extension, health component, pro-poor component, implementation of Participatory Irrigation Management (PIM) through formation and capacity building of farmers' Water User Associations (WUAs), training of WUAs, Water Resources Department officials and strengthening of project management unit. The other components are project monitoring & evaluation as well as consulting services in the area of engineering and management (JBIC, 2005a). The project commenced in April 2005 and scheduled to be completed by December 2011. JBIC is providing a loan amount of JPY 11,555 million.

2.2 Kurnool-Cuddapah Canal Modernization Project (Andhra Pradesh)

The project features physical improvement which includes construction of Tungabhadra Barrage; modernization of main canal, distributaries, structures and farm roads; creation of command area for irrigating for 106,420 hectare. The project aims at implementing PIM, where formation of WUAs and capacity building of Water & Land Management Training and Research Institute (WALMTARI) are included. The agricultural support component covers dissemination of the agricultural experience and knowledge (e.g. gained from On-Farm Development) with local NGOs and introduction of WUA consolidation activities to motivate farmers through micro-credit and community assets building. The modernization project commenced in February 1996 and scheduled to be completed by March 2009 with a loan amount of JPY 20,822 million.

2.3 Rengali Irrigation Project (Orissa)

The project commenced in January 1998 and scheduled to be completed by December 2007 with loan amount of JPY 14,102 million. The project components are physical improvement covering construction of Rengali Left Bank Canal System (RD 29.177 km to 71.3 km) which will provide irrigation to 29,176 hectares of land area. The other features of the project are Participatory Irrigation Management, where formation of Pani Panchayats (PPs) or WUAs (see Box. 1) and capacity building of Water & Land Management Institute (WALMI) (see Box. 2). A special feature of the project is health component which emphasises for taking measures to reduce malaria. It is a matter for concerns that irrigation water sources (reservoirs) and increased irrigation water in the target areas will create more detention areas, which would lead to breeding grounds for malaria mosquitoes and pose more malaria threat. Thus the feature includes malaria mitigation measures like early diagnosis and prompt treatment; integrated vector management and training, as well as awareness of the stakeholders. The Agricultural Support includes implementation of technical assistance such as Agricultural Intensification Program (AIP) in collaboration with a local university and NGO. Implementation of micro planning and Entry Point Activities (EPAs) to motivate farmers through micro-credit or community asset building for socio-economic development were also taken up simultaneously.

2.4 Upper Indravati Irrigation Project (Orissa)

The Orissa State Government started the Upper Indravati Multipurpose Project in 1978 to promote the comprehensive development of the region, which tends to suffer from drought. The project comprises of three units, Unit I (dams and reservoirs), Unit II (irrigation), and Unit III (hydroelectric power). For this project a reservoir with dams and dykes on the upper Indravati River, a branch of the Godavari River has been constructed. Water from this reservoir is led to the Mahanadi River basin through a tunnel to produce 600 MW (four generators at 150 MW per generator) of hydroelectric power. After generation of hydroelectricity, the tailrace water is used as the source for irrigation and the following four components are being constructed as apart of 'Unit II' for a designed ayacut of 109,000 ha (JBIC 2003a). Construction of a Barrage dam on the Hati river, where the tailrace water will be picked up for irrigation purpose. It has following features.

- Construction of left main canal (52 km), distributary canal and water course / field channel
- Construction of right Main Canal (70 km), distributary canal and water course / field channel
- Construction of left pump-up waterway (56 km), distributary canal and water course field channel

Box 1: Organized Participation Structure of Farmers' Organisation for PIM Programme in Orissa (India)

In the recent days there have been a paradigm shift in the policies and practices on irrigation management around the world.. Admittedly, Participatory Irrigation Management through Irrigation Management Transfer to Farmers' Organisations is now widely accepted and used as an effective tool for sustainable irrigated agriculture. The level of transfer of management responsibility precisely varies from different types of irrigation system. In India during 1990s systematic institutional and organizational changes have been undertaken to increase farmers' participation in irrigation management through formation of Water Users' Association (WUA). Orissa is a state in the dominion of India. In Orissa, PIM approach put in to practice through formation of Water Users Association (WUA), which is known as Pani Panchayat (PP). PP is the primary level farmer organization (Das et.al.2004). The structural arrangement of farmer organization is three tiers for Medium Irrigation Projects (Benefiting ayacut 2,000-10,000 ha) and four tiers for Major Irrigation Projects (Benefiting ayacut more than 10,000 ha) and its hierarchical arrangement is indicated below.

- WUA / Pani Panchayat at primary level consisting of several Chak or Outlet Committees.
- Distributary Committee at secondary level (major projects) is a federation of all the WUAs / Pani Panchayats under the distributary
- A Project Committee at project level is a federation of all Distributary Committees for Major Projects. Similarly for medium irrigation projects, a Project Committee at project level is a federation all the WUAs / Pani Panchayats.

A Pani Panchayat/WUA is an association of all persons owning land within a hydrologically delineated portion of the command area ranging in size approximately from 300-600 ha. in case of major/medium / minor irrigation project. It may be in respect of minor or sub-minor or direct outlets from the main or branch canal of the project. In case of minor flow or lift irrigation, the area is limited to project command area when the project command area is less than 300 ha.. The WUA/Pani Panchayat is a part of the farmers' organisation recognized by Orissa Pani Panchayat Act 2002, also all farmers organizations are body corporate as defined therein.

This irrigation project is being taken up for construction part by part. The project is designed to increase agricultural production and improve productivity by constructing irrigation facilities in this region of the Orissa State, where agriculture's reliance on rainwater results in unstable harvests and low productivity. This project contributes to the alleviation of poverty by raising the incomes of the people in the command area who are mainly scheduled castes and scheduled tribes.

ODA Loan portion of the above-described Unit II is composed of a part of "(2) Construction of left main canal (52 km), distributary canal and water course / field channel." In detail the engineering works such as construction of left main canal from R.D 15 km to R.D 52 km for a length of 37 km, distributary canal from the left main canal for a length of 48.3 km and supply channels for this portion 106.4 km in 434 locations along with water course field channel for 434.2 km in 2,571 locations have been completed in December 1998 and benefiting 47,185 hectares.

Box 2: Water and Land Management Institute (Orissa)

Water and Land Management Institute (WALMI) is the premier State level Institute pledged to the capacity building of officers and farmers engaged in irrigated agricultural activities of the State. The activities of the institute includes imparting training, conducting research studies and providing consultancy services pertaining to the fields of (i) Irrigation Engineering and Management (ii) Drainage Engineering (iii) Water Resources Development and Management (iv) Agricultural Planning and Management (v) Watershed Development and Management (vi) Participatory Irrigation Management and (vii) Land Development.

Training

A team of highly qualified and trained multidisciplinary faculty imparts the training. During the years 1995-96 to end of March 2005 the Institute has imparted training to 19,460 persons comprising of 10030 government officers belonging to Major, Medium, Minor irrigation project & CAD as well as officers of Department of Agriculture and 9430 farmers belonging to different irrigation commands of the State.

In order to strengthen, consolidate and enhance the irrigated agricultural development of the state, the Institute is vigorously working in the capacity building of the personnel involved in such activities. Participatory Irrigation Management (PIM) has been identified and implemented through officially called “Pani Panchayat Programme” for sustainable provision of irrigation facilities for achieving holistic development of the farmers and the State. In this pursuit, during last few years the Institute contemplated programs and activities where “Pani Panchayat” concept is induced to the participants from Department of Water Resources, Department. of Agriculture and Revenue Departments for its awareness creation, propagation and appropriate and proper implementation.

Research

WALMI has taken up studies on organisation procedural changes through its Action and Adaptive Research programme. WALMI had taken up model study on Stepped Type Spillway of Truncated Jambhira Dam (Earth Dam) and has submitted the report. A research study on shallow flood control sponsored by Central Board of Irrigation and Power was successfully carried out and findings of Research are recommended for the water logged area of Nimapara. Performance evaluation of Sunei Irrigation Project sponsored by CWC was taken up and the report submitted to CWC. WALMI has also submitted a report on “Water Management Practices and Bio-diversity” to The Nature and Wildlife Conservation Society of Orissa (NWCSO) under a sponsored study work.

Outreach Activities

WALMI has taken up Action Research and Adaptive Research activities during last 10 years in different irrigation projects such as: Kuanria Medium Irrigation Project, Gohira Medium Irrigation Project, Mahanadi Delta Stage – I and Stage – II (Selected minors), Hirakud Project (Selected minors), Kalo Project, Salandi Irrigation Project (Selected minors), Kanjhari Irrigation Project, Uttei Irrigation Project. Further to this, in other pilot projects such as Ghodahad, Aunli and Derjang, WALMI has provided technical training, guidance and other capacity building inputs to the implementing agencies such as NGOs, Departmental Officers and Staff. The Institute is actively associated with the statewide awareness campaign and capacity building for Pani Panchayat Schemes. In these projects WALMI has created awareness among the farmers for forming Pani Panchayats for Participatory Irrigation Management in addition to collection of primary information.

The post evaluation of this project shows that the project provides the farmers in the region an opportunity to do farming during dry periods, which would not have been possible without irrigation. It has significantly increased the income and living standards of the farmers of the region, of course majority of them are Scheduled Castes and Scheduled Tribes. From the Table 1 and Table 2, it can be seen that the area coverage under different crop and production of different crop, particularly rice has increased significantly after the implementation of the scheme (JBIC 2003a).

Table 1 Comparison of Planted Acreage of Main Crops Upper Indravati Irrigation Project (with planned levels and prior to project)

Crop Type	Comparison with Planned Levels			Comparison with Levels Prior to Project	
	Planned Levels (ha)	FY2001 Actual Levels (ha)	% of Plan	Prior to Project (ha)	% of Increase in Planted Acreage
Sugar Cane	4,156	580	14.0	-	-
Rice	44,232	73,871	167.0	21,257	347.5
Vegetables	5,818	400	6.9	-	-
Potatoes	1,666	-	-	-	-
Wheat	4,156	315	7.6	-	-
Peanuts	1,871	170	9.1	-	-
Beans	11,636	284	2.4	2,543	11.2
Miscellaneous Grains	-	-	-	1,453	-
Corn	-	-	-	2,712	-
Other	10,385	185	1.8	-	-
Total	83,920	75,805	90.3	27,966	364.1

Note: Boxes with no data were either “not planned” (at planning time) or “not planted” (see under “FY2001 Actual Levels”).

Source: (JBIC 2003a)

Due to the impact of irrigation the farm households’ income is in an uptrend, surpassing the planned goal (19,800 rupees) and reaching 31,000 rupees in FY2000. In real terms, it was found that farm households’ income increased dramatically following the completion of the project (1998).

Irrigation has helped dry season farming, which provides employment opportunities to tenant farmers and small-scale farmers. This has also helped in arresting migration to other areas during dry season as employment opportunity has increased. The secondary impact of the project is that the water from the irrigation canal is also being used by the households for their domestic use. Increased income has made it possible for the children to go to school and the family to buy consumer durables. However, crop diversification has not been fully achieved yet. This will take time, as the farmers will have to be educated on crop diversification. Though the process of formation of WUAs/ PPs, was slow in this project at the beginning due to absence of proper policy and act supporting PIM, now gaining momentum due to present PIM policy and appropriate legislation by the state (Das, (2005a,2005b)).

Table 2: Comparison of Yield of Main Crops (with planned levels and prior to project)

Crop	Comparison with Planned Levels			Comparison with Levels Prior to Project	
	Planned Levels (1,000 tons)	FY2001 Actual Levels (1,000 tons)	% of Plan (%)	Prior to Project (1,000 tons)	% of Increase in Yield (%)
Sugar Cane	410.6	40.6	9.9	-	-
Rice	203.6	374.8	184.1	34.0	1102.0
Vegetables	72.1	4.8	6.7	-	-
Potatoes	30.8	0.0	0.0	-	-
Wheat	12.5	1.6	12.6	-	-
Peanuts	3.7	0.2	5.9	-	-
Beans	11.6	0.2	2.0	0.9	24.9
Miscellaneous Grains	-	-	-	1.2	-
Corn	-	-	-	3.3	-

Source: (JBIC 2003a)

3. Irrigation Development through JBIC Assistance in Other Countries

JBIC is also assisting many other countries for development of irrigation. Some such ODS assisted developments in context of BIMSTEC are briefed below.

3.1 Thailand

The proportion of developed irrigable area with JBIC assistance is 3.5% to country total in Thailand (Hiroo et.al., 2004). As on September 2000 cumulative Japanese ODA loan to Thailand in Irrigation and flood control consisting of 14 projects amounting to 57,878 million yen (JBIC, 2003e). According to the Ministry of Foreign Affairs' Country Assistance Plan, the identified and agreed priority areas of economic assistance to Thailand during 1996 and currently considered to be valid are Social sector assistance Environmental protection, Rural development: support for the promotion of agricultural-related activities and rural development in regions where development has been lagging, Economic infrastructure upgrade and Regional cooperation assistance.

Based on the above-mentioned Country Assistance Plan, the JBIC has formulated the priority sectors for assistance to Thailand emphasising (i) Rectification of the regional and income disparities with economic growth; (ii) Environmental protection measures, (iii) Development and upgrading of the insufficient economic infrastructure, (iv) Reformation of industrial structure, (v) Education and training of human resources, and (vi) Agricultural development

Agricultural Irrigation Development in the Mae Kuang River Basin (Thailand)

In the Mae Kuang River Basin a total of three dams were planned on the left, main and right bank and distribution net work to manage flood and provide irrigation to a command area of 20,000 ha from Chiang Mai Province to Lamphun Province that would provide sufficient water in both rainy and dry seasons. An evaluation in the year 2000 results that almost 70% of the irrigated area targeted in the development study was completed but the water storage is currently insufficient to cover the developed irrigation area.

Impact: The recommendations of the development study and analysis based on which the OECF loan was availed, resulted in steady increase in irrigated area due to urbanization,

afforestation and inland aquaculture, and almost 70% of the initially planned area has been irrigated. Dam construction resulted in flood management and prevented loss of 27 million baht (based on value conversion of the 24% estimated water lost in floods in 1997). Land use within the region targeted in the project has increased every year due to urbanization. After irrigation development, agriculture began to be focused on chilli peppers, vegetables, fruit, and inland-fishery rather than traditional rice cultivation. A comparison of the harvests in 1992/1993 and 1996/1997 shows that while yields did not change in the rainy seasons, yields in dry seasons increased by 45.5%. The Lamphun region saw a 78.6% increase in yield in dry seasons. Inland aquaculture: Fish catches increased 120 tons in the weir and 150 tons in fish hatcheries. As of 1999, there were 130 Water Users' Groups (WUGs) and 12 Water Users' Associations (WUAs). Dam water has not only been used for irrigation, but also supplied to the Doi Salet District in Chiang Mai Province.

Sustainability: The Royal Irrigation Department is the primary supporter of sustainability, and regional offices still continue activities in line with the farmers' organization and irrigation development as part of the Mae Kuang Operation and Management Project (MKOMP). Sustainability has been achieved. The office of the Mae Kuang Irrigation Agriculture Development Project (MKIADP) strengthens the roles and responsibilities of WUGs. MKIADP staffs are in charge of water management, taking responsibility for 1,300 ha in area and 31.3 km in distance. Currently offices were set up in the applicable regions under the MKIADP and MKPMP and efforts are being made to ensure the project's sustainability. This has strengthened the economy of the area.

3.2 Bangladesh

The largest challenge for Bangladesh is poverty reduction. The priority of JBIC's assistance aims at economic infrastructure development, agricultural and rural development to boost output in the agricultural sector, the country's major employment sector and support for the poor. In providing support, JBIC is paying due attention to the country's external indebtedness and debt repayment capacity, while seeking to improve the capacity of policy-making and implementation, strengthen the organisational capacity of the government sector and collaborate closely with NGOs.

Engineering Services for Narayanganj-Narsingdi Flood Protection and Irrigation Project

The Bangladesh economy is largely dependent on the agricultural sector which accounts for 35% of its Gross Domestic Product and 66% of employed labour force. The percent of people living below US\$ 1 a day is 36 (UNDP, 2003). Grain production which accounts for 80% of total agricultural production, has been seriously affected by floods in the monsoon season and droughts during the dry season, which has forced Bangladesh to import food products whenever natural calamities hit the nation. As the government is concerned about deterioration of the national budget due to excessive food import, it puts high priority on the increase of food production and on implementing flood control, drainage and irrigation projects all over the country. In this aspect consulting services for Narayanganj-Narsingdi Flood Protection and Irrigation Project is one of the assisted projects of the Overseas Economic Cooperation Fund of Japan. The loan amount is 339 million yen (OECD, 1997), JBIC (2003c).

The project areas of Narayanganj and Narsingdi districts are located in the suburbs of the capital city of Dhaka and the major activity in these districts is agriculture. However, productivity is low because of the effect of floods in most of the area during the rainy season and the difficulties in cultivation during the dry season excluding limited swamp lands. In 1977, Japan International Cooperation Agency (JICA) implemented a feasibility study in Narayanganj and Narsingdi districts. Following JICA's study, a portion of the area was developed under two Japanese grants in the 1980's. The project envisages flood protection

embankment utilising the existing banking of roads and railways, irrigation and drainage facilities in the undeveloped areas of Narayanganj and Narsingdi districts. Construction of flood protection embankment, irrigation and drainage facilities will largely contribute to improvement of agricultural productivity and increase in food production in achieving country's development target. In addition to these effects, it will contribute to the regional economy for alleviation of poverty in the area.

4. Community Based Micro Planning and Implementation of Entry Point Activities

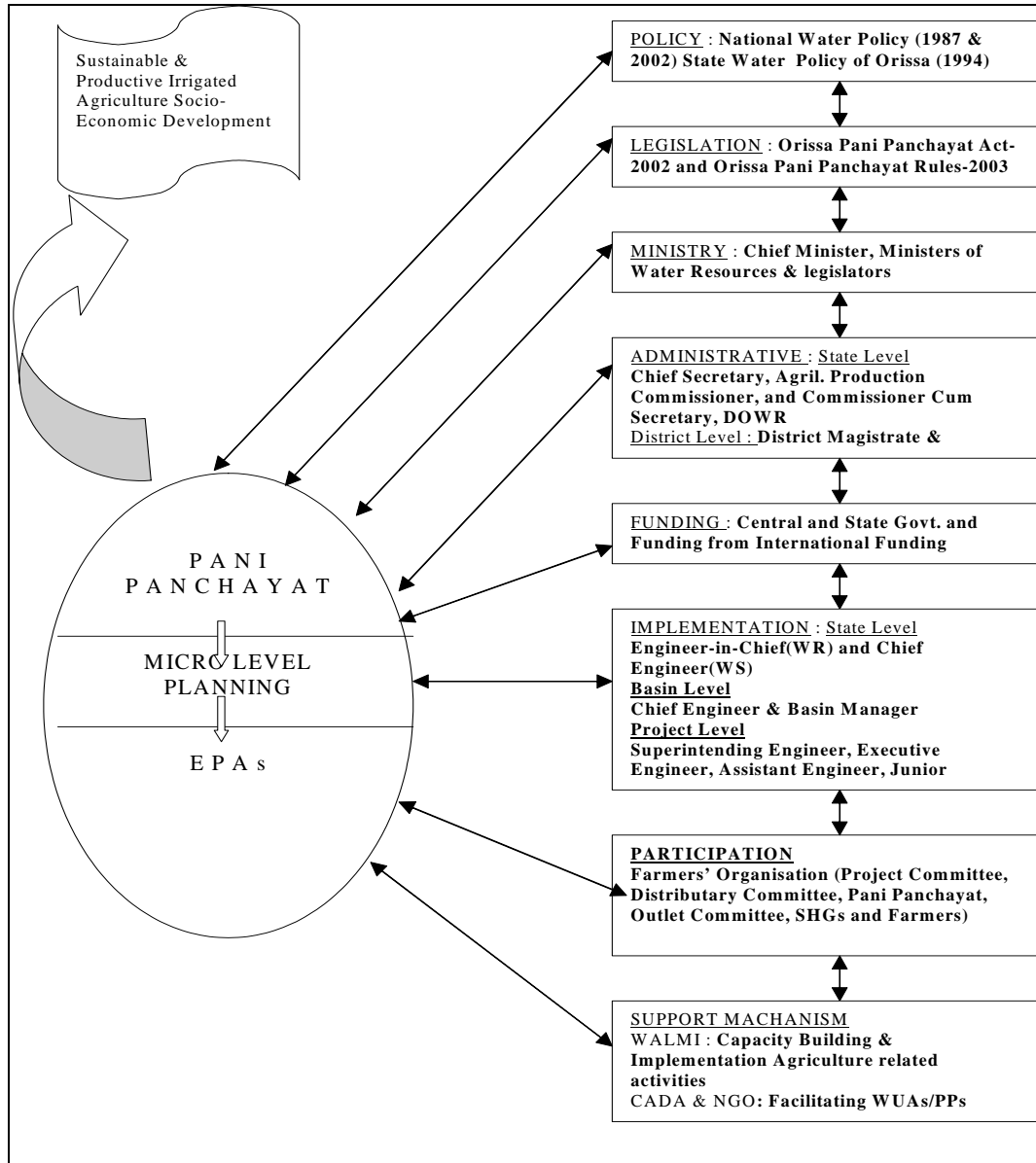
Most of the above mentioned projects are situated in the less developed or tribal dominated region of the respective state, where majority of the farmers are poor and practice subsistence farming. In these projects not only the development of irrigation infrastructure is the sole objective of the funding, but also it aims at its proper management, operation, maintenance and its sustainability. The community-based micro-planning is the strategy for overcoming the key problems faced by the farmers of these Projects with their active participation. The key problem faced by the farmers include unequal water allocation, inefficient water use, shortage of funds, inadequate institutional capacity, lack of integrated water resources management, dilapidated existing irrigation facilities and delayed construction of new irrigation facilities, depletion of ground water and soil degradation, information gap in agricultural diversification and technologies, deficient distribution network and market place, low technological level of food processing and low value addition, rural usury, inaccessibility to different schemes of government like health, sanitation, input supply etc.

Particularly in the JBIC assisted Irrigation Projects like Rengali Irrigation Project, Upper Indravati Irrigation Project and Upper Kolab Irrigation Project of Orissa and Kurnool-Cuddapah Canal Modernization Project of Andhra Pradesh, there are comprehensive plans and are currently being implemented for over coming problems faced by the farmers and achieving above goal. The plan includes the unique feature of Micro Planning and Implementation of Entry Point Activities (EPAs).

In the commands of JBIC assisted irrigation projects, appropriate micro level planning and implementation strategy have been chalked out to ensure sustainability of the irrigation system, food security and socio-economic upliftment of the poor farmers. Particularly for the first time this has been initiated in JBIC assisted irrigation project in Orissa, where JBIC, Department of Water Resources Govt. of Orissa and Water and Land Management Institute (WALMI, Orissa) are working together to implement the Micro Planning and implementation of Entry Point Activities (EPAs) in consultation with the local farming community whenever required assistance of NGOs are being sought. WALMI, Orissa is engaged as implementing agency for a period of two crop seasons and will gradually withdraw as the community become self sustained. In these irrigation project WUAs or Pani Panchayats and Self Help Group (SHG)s are being formed to play vital role in improving irrigation efficiency and agricultural productivity. Further the important features of micro level planning are EPAs for facilitating Micro-credit with revolving fund for undertaking rural farming, non-farming activities, rural women and rural micro-enterprise development and facility for farm mechanization. The other options for micro level planning considered are effective packages of technological and management practices, adoption of commercial farming using market forces and mechanism to enhance efficiency, awareness and capacity building of the stakeholders and other livelihood enhancing measures. Assessment and incorporation of all local specific characteristics for providing effective service delivery, increased productivity, protection of environment and improved socio-economic condition for sustainability of the irrigation projects in the planning process have been considered for implementation. The structural arrangement for sustainable and productive irrigated agriculture for Socio-economic

development is given in Figure 3. This strategic plan may be adopted in other irrigation projects also.

Figure 3: Structural Support Arrangement for Sustainable and productive Irrigated Agriculture for Socio-economic Development



Participation of beneficiary farmers in operation and maintenance (O&M) of irrigation systems for better utilisation of irrigation water is being promoted in many part of the world including India and is popularly known as participatory Irrigation Management (PIM). In Orissa, the PIM is officially named as Pani Panchayat Programme. In many irrigation project, Pani Panchayat programme has already been implemented. In these projects, it is observed that the Pani Panchayats (PPs) need more capacity building training and guidance to carry out the activities related to their rights and responsibilities properly (Das 2005a, 2005b). WALMI, Orissa by virtue of its rich experience and expertise in this field is providing able guidance to the PPs, those are already formed and under formation stage, to move forward and to function effectively for overall development of the farming community. These PPs will be sustainable,

if they orient their agriculture production towards the market economy and are able to convert their traditional agriculture to a profitable enterprise (Das et. al. (2003 & 2004)). It is necessary to identify and develop marketing network for the farming community which will provide input supply and required services and facilitate trading of agricultural products. For overcoming foreseeable problems and concurrent difficulties, currently the PPs are being trained and guided by WALMI, Orissa. As soon as the farmers gain sufficient experience on the recent technology on agriculture production system and network for marketing are developed and established, WALMI will withdraw from the project. There after the PPs can run independently and can cater the needs of the farmers.

4.1 Relevance of the Micro Plan and EPA

Preliminary studies conducted in these projects show that rice-rice is the dominant cropping pattern followed by the farmers. The main rice crop is raised from June to December and the summer rice crop is raised from January to May. The water in canals is supplied accordingly from July to November and January to May to support this cropping pattern. The present agriculture production system in these projects has the following shortcomings.

- Irrigation water is available round the year from the hydro-power generation units which can support 3 crop sequences. At present, the rabi season (November-February) does not exist and is overlapped by kharif and summer season crops. As a result, the irrigation potentials are not fully utilized.
- Rice is the dominant crop grown in summer season. Since the outlet size is designed to provide supplemental irrigation to the kharif rice crop @ 6-7 mm/ha/day, it fails to meet water requirement of summer rice, which is about 12 mm/ha/day. As a result, a sizable area in each outlet remains unirrigated and rice is grown over a limited area benefiting only a few farmers. There is again underutilisation of irrigation potential and social inequity of water distribution.
- Rice cropping pattern over years leads to problems like waterlogging and reduction in soil productivity of command area of Kotpad area in Upper Kolab Irrigation Project and a large part of Upper Indravati Irrigation Project.
- Due to distress sale of paddy in recent years, the present cropping pattern gives very low return to the farmers.
- Besides inefficient use of water and land resources, the prospect of present irrigated agriculture in these projects is limited by lack of marketing and storage infrastructure, exploitation of farmers by middle men and private money lenders, low awareness level etc.

In order to increase the performance of these irrigation projects, main thrust under micro-plan is to undertake software and hardware activities to transform the present rice-rice monoculture system to diversified agriculture production system. Technical and socio-economic constraints experienced for agriculture diversification in these projects will be removed through establishing proper co-operation among the farmers and line departments. To meet this challenge the micro-plan implementation objectives in pilot PPs in these projects are as follows.

- To inculcate the feeling of the self-help among the farmers and to develop a mechanism meeting challenges through group action;
- To build the capacity of PPs to make use of services from Govt. and non-Govt. agencies;
- To develop software measures for efficient use of water, land, labor and other available resources;
- To diversify the agriculture production system to produce variety of cash and commercial crops to make agriculture profitable;

- To identify and promote market linkages for ready availability of inputs/ services and quick disposal of agricultural and non-agricultural products;
- To bring out EPAs through PRA that are required by the members of pilot PPs aiming at improving livelihood and sustainable irrigated agriculture.

4.2 General Guidelines for Implementation of EPAs

- Initially EPAs would be taken up in Pilot PPs having micro distribution network or field channels. If a Pilot PP does not have micro-distribution net-work then in the Entry Point Activity it should be given priority to develop micro distribution system which is necessary for scientific on-farm water management.
- Entry point activities would be carried out with the maximum limit of Rs.0.6 million per PP. The activities to be implemented shall be decided by the farming community PPs under guidance of WALMI/ Department of Water Resources (DOWR).
- The project authority i.e DOWR will transfer the entire amount of Rs. 0.6 million to the pilot PPs for taking up different activities based on the results of PRA to be carried out by the implementing agency. The entry point activity will include Community welfare, Micro-credit or Rural credit disbursement through SHG and development of micro-enterprise to improve livelihood in command area or any other activity for sustainable agriculture or improvement of livelihood of farmers in the command area. An agreement will be signed by PP and the Executive Engineer on behalf of the Project authority for this purpose.
- Based on Results of PRA carried out by implementing agency, competent officers of DOWR, in consultation with the PP shall approve EPA.
- The PP -wise accepted list of Entry Point Activities would consolidated for reference of DOWR and JBIC.
- Earlier studies by JBIC indicate that income generation activities through revolving micro-credit system are essential in command areas. The chak committees may be treated as SHGs for crop diversification and other income generation activities. If necessary additional SHGs need to be formed for taking up different agricultural support services duly approved by respective PP. The amount identified for the purpose should be earmarked and the pilot PP will sanction loan to SHGs from this amount. The PPs are authorized to utilise this amount along with accrued interest for the purpose of income generation through Micro Credit mechanism.
- SHGs will be encouraged for taking up community farming,
- For Community welfare the PP will be authorized for selection of items such as procurement of machinery/ farm equipment for farm-mechanization and utilization of improved agriculture farm machinery to be used by the general members of PP. The equipment may include tractor, cultivator, ploughs, threshers, seed drills etc. The running and maintenance are to be borne by farmers by charging rentals. These equipment/ implements are to be used in same manner by all PPs under the corresponding Distributary Committee after the pilot study
- WALMI will educate the farmers, including the women, regarding the importance and benefits of formation of Self Help Groups (SHGs) and initial operation in the PP area and would also be responsible for the implementation of EPAs in coordination with the DOWR.
- Loans for income generation activities shall be provided to SHGs. Loans to individuals shall not be encouraged as the recovery pattern from individual borrowers has been observed very low in other similar projects. As regards, the rate of interest on loans, PP shall have the discretion to decide the same. However, some rate of interest necessarily needs to be charged in order to offset the bad debts (which may occur) and also to increase the corpus fund.
- For agricultural intensification works PP has to contribute a portion of the cost either in cash or kind to establish ownership. The portion of contribution will remain with the

concerned PP after the pilot study is over, whereas the infrastructure and main agricultural equipment will be transferred to Distributary Committee for larger use.

- In the EPAs, it is taken care that there will not be any effort to duplicate the activity that the other departments are already making. But the activity should emphasise the convergence of the activities of various departments. In case of inadequacy, the convergence and co-ordination will be strengthened.
- The DOWR would facilitate augmenting institutional capacity of the PP for maintaining services, facilities and works undertaken through EPAs. PPs will also be given scope for taking up resources generation activities. For this purpose PP would be encouraged to take-up small scale work contracts pertaining to improvement works in their jurisdiction. As per the provisions of Pani Panchayat Act, DOWR. will also make efforts to mobilize other government departments to extend their schemes in the project area so as to enhance the developmental works in these selected area and also maintain the assets created under entry point activities in the PP area. Such schemes may include health, sanitation, education, Swarna Jayanti Gramya Swarozgar Yajana (SGSY) and other new schemes.
- In order to have more coordinated extending of activities, of other departments; DOWR will take help from District Pani Panchayat Coordination Committee under the Chairmanship of the District Collector. Executive Engineer shall be the member Secretary and other members would comprise officials of other government departments. In addition to provisions of Pani Panchayat Act 2002 this committee shall meet at least once in two months to explore and plan the possibility of enhancing the developmental works (other than project activities) and in the project villages.
- The DOWR shall maintain proper accounts PP wise of all the entry point activities undertaken in the project area. This will be subjected to audit checks by the state audit department as per the procedure laid down. The same shall be made available to the JBIC as and when required. JBIC may undertake such other reviews as considered necessary.
- A mechanism for monitoring of the implementation of EPAs need to be established for effective implementation and providing timely suggestions..
- Display board would be put in each Pani Panchayat by the Water Resources Department clearly specifying the EPAs carried out in that Pani Panchayat along with the amount spent by the DOWR.

4.3 Micro Planning & EPA Strategies in Pani Panchayats for Sustainability

The following strategic plans are made for implementing EPAs as irrigation projects now a day attract high priority for sustainable agriculture. Currently in Orissa, the EPAs are being implemented in JBIC assisted irrigation projects with the help of highly qualified and experienced multidisciplinary faculty members and action research personnel of WALMI (Orissa). The activities are as follows.

PRA

Participatory Rural Appraisal by WALMI Faculty Members and Facilitators (Action Research personnel) to bring out needs of the WUA members those are to be included in entry point activity.

PWT

- Participatory walkthrough for testing the hydraulic structures and to know the canal conveyance, controlling mechanism and water measuring aspects and taking up necessary steps in restoration or rehabilitation.
- Audit of existing micro-distribution system and suggestion of improvement.

Motivation & Formation of SHG

- Motivation and Formation of Self Help Group (SHGs) explaining the benefits to the members of the SHGs. This includes various stages i.e. group formation, group stabilization etc. For EPAs the chak committee may also be taken as a self help group.
- Encouraging SHGs for community farming, input supply service, marketing service, and transport service, Service for packaging and value addition.
- Encouraging private entrepreneurs/ SHGs for agriculture processing industries and small warehouses to store produce scientifically.
- Farmers training on chak/outlet basis to discuss the soil, climate, canal conveyance and supply, feasible cropping pattern for the outlet)

Soil Survey

Available soil survey data will be utilized for crop planning and recommending appropriate package of practice.

Exposure Visit, Training, Field Demonstration, Implementation, Monitoring & Evaluation of Irrigation and Agricultural Activities, Inter-departmental Co-ordination, WUA Activities

- Conducting exposure visits to advance areas in practice.
- Demonstration on crop diversification and packages of practices for irrigated dry (ID) crops, vegetables, fruits, maize, sugarcane, medicinal plants, spices etc. to be identified after PRA.
- Market mapping, Demand survey for products, identification of Buyers, Establishing marketing network
- Streamlining credit facilities and crop insurance, acquisition of micro-finance skills such as internal lending, fixation of interest rate and loan recovery schedule and building of corpus funds.
- Identified training for Farmers and stakeholders
 - (i) Training on capacity building for office maintenance for PP executive members and self help groups. Role and responsibilities of WUAs.
 - (ii) Irrigation system, Water Availability, Water Requirement, Irrigation Scheduling, Canal operation, Irrigation Water Management etc.
 - (iii) Crop diversification, package of practices for cash crops
 - (iv) Diversification for Kharif Paddy and Water Management including package of Practices.
 - (v) Farm machinery & implements and their maintenance
 - (vi) Effects of disasters and adverse climatic situation and mitigation plans
 - (vii) Assessment of additional training needs during EPA Period

Workshops & Motivation

This will involve interaction of interest groups and stakeholders to identify improvement in activities for sustainability of the projects.

- Workshop on Government schemes, input supply, incentives, credits, subsidies, insurance, produce storing, processing, value addition, marketing, education, health etc.
- Selection and motivation of large buyers and service providers.

Documentation and Video Module Preparation

This activity will document all the activities in the process and a video module will be produced for replicate purpose.

Monitoring and Evaluation

Periodic Monitoring and Evaluation of implementation of micro-plan and EPAs for strengthening the Programme will be carried out to ensure that the objectives are fulfilled. Indicators to this effect will be based on approved EPAs. However some indicators like Crop Diversification, Productivity, Water Distribution Indices etc. will be monitored.

Programme implementation

(a) Structure of programme implementation

The programme is being implemented by implementation teams (IT), comprising multi disciplinary action research staff of WALMI. A multi disciplinary team consisting of engineering, agriculture and sociology faculty of WALMI will act as the supervising expert team (SET). WALMI will take up the work basing on the reported findings of the earlier study done by JBIC.

(b) Operation of corpus fund

Shifting from traditional rain-fed rice farming to intensive multiple cropping under irrigation, requires capital expenditure for various activities. Very often, due to non-availability of adequate and timely credit from formal financing institution, the farmers depend on money lenders and borrow at exorbitant interest rates. Most of the resource poor farmers fail to apply recommended technology leading to poor production. Easy access to soft loans through micro-credit finance will help the poor farmers to purchase good quality inputs for application at right time. The grant component to be used as the corpus fund for providing micro-credits to SHGs will be utilised as follows.

- Credit will be provided to SHGs, not to the individuals, for undertaking rural farming, non-farming activities, rural woman and rural micro-enterprise development. The farming system includes manufacturing bio-fertilisers, vermi compost, commercial crop nursery, seed production, soil testing, crop protection, horticulture (vegetable production), floriculture etc. The non-farming activities include dairy, poultry, intermediate processing of fruits and vegetables for value addition etc. The credit may be extended for self-employment for rural women and micro enterprise development.
- Credits may be extended for improving rural living condition, such as sanitation, cooking gas connection and other activities.
- The activities will also take care of persons engaged in selling firewood to undertake micro-enterprise based on minor forest produces and rural enterprises.

For sustainable micro-credit or rural credit delivery, appropriate system has been designed for micro enterprise development to reduce the finance problem and risk of small and marginal farmers. This includes multiple dose of credit over a period of time with second and subsequent dose(s), enabling them to access higher amount of credit. They should have confidence that so long as they prove their credit worthiness by way of proper utilization of the asset and prompt repayment, the created corpus fund will stand by them and will grow to provide additional credit. The SHGs will be allowed to stabilize and improve their credit absorption capacity and to increase their fund as well as increase their credit intake over the years either for the same activity or a new activity. The credit system will have in-built mechanism for easy installments and incentive to members making regular repayments etc.

5. Conclusion

In irrigation projects, active participation by the farmers who are the beneficiaries is indispensable, with Water Users Associations/ Pani Panchayat as the center of activity. In order to strengthen the Water Users Associations/ Pani Panchayats and to promote participation by farmers, first a study should be made to ascertain the social and economic conditions of the beneficiaries, such as tribes, land ownership, and existing inhabitants social and cultural institutions and organizations, etc.. The study needs to indicate problems in markets, technology, and capital, etc. in detail. Once the socio-economic survey is done, an action plan clarifying the rights and responsibilities of different stakeholders should be prepared at a stage sufficiently ahead of the launching of irrigation water supply.

The executing agency or Government Department of Water Resources need to promote early transfer of operation and maintenance of manageable portion of irrigation system to Water Users Associations / Pani Panchayat. Also it is necessary to build the capacity of Water Users Associations and provide full support for on-going technological know how in order to promote self-reliance and the realization of sustainability.

It is evident from the study that the objective of providing assistance for alleviation of poverty and rural upliftment strategy of JBIC in developing countries is significantly different from other international funding agencies and quite comprehensive for achieving the goal. Assisting for poverty reduction by way of promoting schemes for agricultural productivity improvement through irrigation is not only the motto but it integrates community based participatory approaches to support agricultural development like improving access to markets or the use of new production technologies, promote environmentally sustainable production activities, facilitates education about alternative routes for employment, gender issues, measures to improve income and livelihood through micro-finance; rural infrastructure up gradation such as roads, to improve access to markets and product distribution, participatory processes to empower the rural poor with core skills (such as producing local food products), while helping them to set up a business plan, obtain market information and comply with health measures. In fact, external assistance for mega projects also need more careful planning at micro level so that the project becomes sustainable.

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