WORKING PAPER 66

# Improving Agricultural Productivity for Poverty Alleviation through Integrated Service Provision with Public-Private Sector Partnerships: Examples and Issues

Intizar Hussain and L.R. Perera

International Water Management Institute

FUTURE HARVEST

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## Summary

Enduring low agricultural productivity is one of the major causes of rural poverty in South Asia. Based on a review of recent empirical studies, this paper focuses on three key questions: (1) why is agricultural productivity low in the region?; (2) what are the key constraints and opportunities for enhancing agricultural productivity; and (3) what are the effective mechanisms to improve access to key productivity enhancing technologies, factors and services. Two major points raised in the paper are: (a) improved management of land and water is important for increasing productivity, but equally important is farmer access to non land and water-related inputs and services, which through their complementary relationships with water, increase the productivity and value of water. Even if most of the constraints related to land and water are removed through improved management, the resulting gains in productivity may not be sufficient-in the presence of constraints related to other factors and services-to have any significant impacts on poverty. Therefore, in order to generate any major increases in productivity, improved access for farmers to non land and water-related factors and services is also important; (b) access to these factors and services can be improved by providing them in an integrated manner with public-private sector partnerships. Based on examples of various models, initiatives and practices from Pakistan, India, Sri Lanka, China, Sub-Saharan Africa and other countries, the study suggests a framework for integrated services provision in the agriculture sector, and raises key research issues and questions to be explored.

## Backdrop

Over the past three decades, growth in global food production has outpaced population growth. In aggregate terms, the world is producing more than 2,500 kcal of food per capita, which is enough to fulfill the food needs of the entire world population. At the national level too, food supplies are no longer a major problem in most developing countries, especially in Asia. Apparently, there is an abundance of food in the world and specifically in the Asian region. Yet the stark reality is that in virtually every country, there are communities and groups of people who suffer from endemic undernourishment and lead lives of persistent food insecurity and poverty. The majority of the world's poor and food insecure people are concentrated in countries within two regions-South Asia and Sub-Saharan Africa. South Asia as whole is self-sufficient in food, but over one third of the population in the region continues to be deprived of food and other basic necessities of life. Therefore, the issue is not one of availability of food and basic needs in aggregate terms, but of access to them at the local/community and household level.

There are three major reasons for the lack of access to food-poor and food insecure people have only limited means to produce their own food due to lack of access to key production resources; or (2) they have limited means to buy food due to lack of access to opportunities, (3) or in certain situations food is not available at the local level due to problems in distribution systems. Therefore, the issue is one of equity, distribution and access. Mere availability of sufficient quantities of food at the global or national level is not a guarantee that communities and households or individuals will be food secure.

Where are the food insecure and poor households and communities located? They are spread everywhere in these countries, in rural as well as in urban areas. But a large majority of the poor and food insecure households are located in rural areas. Importantly, a majority of the rural poor depend directly or indirectly on agriculture for their livelihoods, and will continue to do so until opportunities in non-farm sectors expand, which are currently growing at a very slow pace in most South Asian countries. The poor with tiny land holdings and the landless will continue to depend on agriculture for food, employment and incomes required for non-food and basic needs.

Within agricultural areas, poverty prevails in both agriculturally more productive as well as less productive/marginal areas-although the prevalence and depth of poverty is generally more pronounced in marginal areas, especially those which also lack alternate non-agricultural sources of livelihoods. While causes of poverty differ across these areas and across communities within them, two of the major reasons for poverty in agriculturally dependent communities are, (1) lack of access to factors of production (land, water, technology, other production inputs) and (2) poor institutional arrangements under which production and transactions takes place-both of these affect levels of productivity (resource productivity and labor productivity).

There seems to be a general consensus now that development of agricultural economies through enhancing agricultural productivity will be one of the key strategies for eliminating food insecurity and alleviating poverty. In relation to rural poverty alleviation in South Asia, Hussain (2003) based on recent research at IWMI, suggests that effective rural poverty alleviation efforts must focus on the following: (1) increasing crop/agricultural productivity through pro-poor interventions including, (a) redistribution of land and water resources, ((b) integrated land and water management, and (c) integrated service provision for non-land and water inputs and services through public-private sectors partnerships; (2) increasing production and productivity of the non-crop farm sector (e.g. livestock), which means generating land-based employment and income opportunities for the poor; and

(3) developing the non-farm sector for the poor, which means generating non-land-based livelihood opportunities for the poor and landless through small businesses, non-farm enterprise development, skills improvement and vocational training. In addition, good governance, improved human quality and sound macro-economic policies are important for creating conditions for enhancing effectiveness of poverty alleviation efforts.

In South Asia, it is generally accepted that the full potential of green revolution technology (irrigation, fertilizers, modern seeds, etc.) has not been realized, and the current agricultural productivity levels are not only much lower than in other countries/regions, but also far below the achievable potential. Moreover, there is empirical evidence to suggest that wide variations in productivity exist across farms and geographic regions. For example, recent analyses from the lower Indus basin (Pakistan) indicate that the average irrigated wheat yield across farms varies from 0.5 to 5.4 t/ha (Hussain, Marikar and Jehangir 2000). Other regional studies provide similar evidence. For example, in Indian sates, wheat yield varies from around 2 t/ha in Bihar to around 4 t/ha in Punjab (Kumar et al. 1998, Chand and Haque 1998). Therefore, there is considerable scope for increasing wheat tonnage through productivity improvements.

A major upward shift in the agricultural production function, through productivity enhancements, is needed to effectively improve the level of food security and reduce rural poverty in South Asian countries. The challenge is to narrow the gap between the potential and the actual level of productivity by removing a set of constraints (physical, technical, socioeconomic and institutional) at various levels-macro/policy level, intermediate or management level and micro or field level.

Some of these constraints relate to land and water resources management, others relate to non-land water factors and services. The other inputs and services (such as seeds, fertilizers, production technologies, agricultural equipment, information and knowledge and finance/credit) are also equally important for enhancing productivity, and these are complementary to each other. Essentially, there are two sub-sets of factors influencing productivity-one (sub-set 1) relates to land and water resources, and the second (sub-set 2) relates to non-land and water factors and services, including marketing of produce. In aggregate terms, there is not much scope to further expand land and water resources in most situations, (due to growing scarcity and competition for water across various use sectors resulting from population increases, expansion in urbanization and growing overall economic activities). While, there is scope to increase productivity through improved management of these two resources with effective interventions, overall gains in productivity will depend on management of and access to factors and services in sub-set 2, and associated constraints. Also, whatever gains in productivity achieved through improved management of sub-set 1 factors, may not help achieve the objective of poverty alleviation in the presence of constraints related to factors and services in sub-set 2. What all this implies is that productivity issues needs to be looked at in a more broader framework. Improved management of sub-set 1 factors (land and water) will be important, but equally important will be improved management of and access to factors and services in sub-set 2, which is complementary to sub-set 1. If the objective of significant increase in productivity and significant impacts on poverty is to be realized, along with sub-set 1, interventions will also be needed in the second sub-set of factors and services.

Empirical evidence from our recent studies indicate that access to agricultural water does play an important role in reducing poverty through its direct and indirect impacts on productivity, employment, wages, incomes, consumption and overall livelihoods. These studies conclude that in most rural settings, where agriculture provides a major source of livelihoods, access to agricultural water alone is a necessary but not a sufficient condition to enhance productivity and alleviate poverty.

Access to other factors of production and services, which enhance benefits of water use, are equally important (see Hussain and Hanjra 2003 for details).

This paper focuses on the following three fundamental questions: (1) Why is overall agricultural productivity low in South Asia? What are the key factors influencing productivity?; (2) Can productivity be enhanced? What are the key constraints and opportunities to enhancing productivity?; and (3) What are the effective mechanisms and institutional arrangements to improve access to key productivity enhancing inputs and services, particularly to poor farmers? The focus here is on South Asian countries.

## Objectives

The objectives of this study are (1) to provide an overview of constraints and opportunities for enhancing agricultural productivity, particularly on small farms; (2) to provide an overview of experiences and practices in service delivery in the agricultural sector, and to identify an approach for services provision that has potential to improve access to services by farmers, with a focus on integrated services provision through public-private sector partnerships. The purpose here is to generate more interest and discussion on this important area, with the ultimate aim of providing a realistic and effective framework for services provision in agriculture.

The paper is organized as follows. After a brief introduction and outline of objectives, section 2 provides a review of recent studies on identifying constraints and opportunities, and various ways and means for increasing productivity. This also includes an overview of past and emerging approaches to enhancing productivity. Section 3 presents an outline of the suggested framework for integrated services provision in the agricultural sector. In section 4, examples of models and good practices from Pakistan, India, Sri Lanka, China, Sub-Saharan African countries, and other countries, are provided. The last section summarizes the conclusions, and raises questions for further research.

## Improving Crop Productivity—Review of Constraints and Opportunities

Crop productivity is a function of a range of factors and services. These may be classified as:

1. land and water related factors (such as farm/watercourse location, quality of land, source of water, quality and quantity of water, and timing of water application, etc.)

2. climatic factors (rainfall, temperature, sunshine, frost, etc.)

3. agronomic factors such as quality, quantity and timing of input application (seed, fertilizers, weedicides, labor, etc.)

4. socioeconomic factors (such as farmer education level and experience in farming, farm size, tenancy terms, land fragmentation, availability of credit)

5. farm management factors (adoption of modern production technologies, farm planning and management practices, etc.)

Some of these factors are interrelated and the effects of some of these may be much greater than that of others, and there may be locational variations in the degree of their effects on productivity. Some of these factors may be under the direct control of farmers/growers, others may be controlled by groups of other farmers, managers at the system level and policymakers at the higher level, yet some of these factors are beyond human control.

Tyagi and Sharma (unpublished) and Mudasser, Hussain and Aslam (unpublished) provide an extensive review of literature identifying constraints and technological options for improving crop productivity in India and Pakistan, with a focus on land and water related factors influencing the productivity of wheat in rice-wheat cropping systems. The review by Tyagi and Sharma suggests that factors responsible for keeping the productivity at lower than acceptable levels indicates that constraints are mainly related to soil and water management. There has been considerable progress with research aimed at understanding basic soil-water-plant relationships and technology generation. These efforts have contributed to maintaining continued growth in productivity. However, there has been a decline in productivity growth in the recent years. Key points emerging from the reviewed literature include: (1) in rice-wheat cropping systems in north India, it is suggested that opportunities to improve wheat productivity lie in minimizing the lack of aeration in the root zone through improved surface drainage. This is particularly important for sodicity affected soils which occupy more than 2 million ha of land in the wheat producing zone; (2) there is considerable area under wheat in high water table areas with marginal quality waters with electrical conductivity of 2-4 dS/m. Most of the time water tables in these areas remain between 1-2 m in depth. Water application schedules, presently in vogue, do not take advantage of skimming freshwater overlying the saline water. Water table management in these light textured areas where salts get leached during the monsoon period, can substantially reduce irrigation requirements and help save some nutrient losses; (3) in the cotton-wheat system in the wheat producing zone of northwest India including parts of Haryana, Punjab and Rajasthan, soils are coarse textured and most of these areas are underlain by saline aquifers. It is difficult to improve application efficiencies of surface application methods in these areas. Excessive water applications leach nutrients, raise the water table and generate saline groundwater. Pressurized irrigation has the potential to overcome these constraints.

A review by Mudasser, Hussain and Aslam (2001) indicates that main factors responsible for low crop productivity in Pakistan included: lack of proper land leveling, inadequacy of irrigation water, fertilizer use lower than recommended amounts, lack of access to quality improved seeds, lack of crop protection measures, lack of crop rotation practices, water logging and salinity, poor extension services, and other socioeconomic factors such as size of farms, tenancy status and lack of credit to purchase farm inputs. The review suggests that there is a considerable scope to improve productivity by removing these constraints through improved access to inputs, technologies, information and other related services. Molden, Sakthivadivel and Habib (2001) suggest a number of ways and means to improve land and water productivity. These include: (1) encouraging use of improved crop varieties-varieties that can provide increased yields for each unit of water consumed or the same yield with fewer units of water; (2) promoting high value crops-promoting crops that consume less water or switching to crops that generate higher economic returns per unit of land and water; (3) reallocating water from lower to higher value uses at all levels; (4) promoting crop diversification and multiple cropping on smallholder farms; (5) improving water management to provide timely and a reliable supply of water to enable poor smallholder farmers to apply water and non-water inputs at the right time leading to higher productivity per unit of land and water; (6) promoting small-scale and affordable technologies, for instance, with improved access and with sufficient water control, higher

productivity can be achieved; and (7) optimizing non-water inputs-in combination with water, agronomic inputs and practices such as land preparation and use of fertilizers can increase productivity of land and water.

Hussain et al. (2003) undertook a detailed study on understanding the crop productivity gap, and identifying constraints and opportunities for enhancing productivity for narrowing the existing productivity gap for wheat in India and Pakistan. The study was conducted in Bhakra canal system (BCS) in the Kaithal irrigation circle in India and lower Jehlum canal system (LJCS) in the Chaj sub-basin in Pakistan, representing typical canal irrigation systems in the two countries. Six watercourses on head, middle and tail reaches of two distributaries in each country were selected for detailed field-level data collection. Data on various wheat production activities, and input use including irrigation water use from both canal and groundwater sources were collected, for 216 farms in BCS-India and 218 farms in LJCS-Pakistan, on a daily basis throughout the rabi season (short winter season) from October 2000 to May 2001.

The study identifies several factors influencing land and water productivity of wheat. The results suggest that there is significant scope to improve land and water productivity and profitability of wheat in the western Indo-Gangetic plains of India and Pakistan. The study concludes that productivity can be increased by: (1) improving agronomic/farm management practices-a). promoting the use of improved/newer varieties of seeds, and b) providing/enhancing the role of extension services to farmers for dissemination of up-to-date knowledge on appropriate sowing dates, and quantities and timing of application of inputs, particularly irrigation water; (2) improving water management practices at the farm as well as at the canal level through-a). improving timing of water delivery; and b) increasing the overall canal water supplies at the farm level; and c) considering the inter- and intra-system locational variations (and inequities) in canal water supplies and quality of groundwater The other option to increase farm-level water supplies for increased productivity and profitability of wheat is to reallocate canal water within and across distributaries and encourage the use of groundwater (to sustainable levels) in locations where it is of relatively good quality.

Based on the above and other recent studies, including those carried out in Sri Lanka, Hussain and Hanjra (2003) identify a number of factors that determine the magnitude of productivity enhancing and antipoverty impacts of irrigation water. These include (1) (in)equity in land distribution; (2) irrigation infrastructure condition/management; (3) water allocation/distribution policies, procedures and practices; (4) production technology, cropping patterns, crop diversification; (5) support measures, e.g., input and output marketing and information. Furthermore, they identify a number of interventions for enhancing productivity for poverty alleviation including technological support and crop diversification for small farms.

### *Farmers Perceptions on Productivity-related Problems*

Recently, IWMI undertook detailed farm-household-level surveys to study the impacts of irrigation infrastructure on poverty alleviation in Pakistan and Sri Lanka (see Hussain et al. unpublished 1 and unpublished 2). In Pakistan the study was conducted in the districts of Mandi Bahauddin and Gujrat, in the upper part of the upper Indus basin. Household-level data were collected through surveys conducted five times during 2000-2002, from a sample of 695 households located on 26 watercourses on 6 distributaries, and in adjoining rain-fed areas, using a detailed multi-topic questionnaire. In Sri Lanka, the study was undertaken in IWMI's Benchmark Basin (Ruhuna basin) in the Uda Walawe Left Bank Irrigation System (WLB) in the Uda Walawe area.. Household-

level data were collected through surveys conducted five times during 2000-2002, from a sample of 858 households. In both locations, farmers were also asked to state their major problems with regard to agricultural productivity. The results are presented in tables 1 and 2.

*Table 1. Farmer perceptions on productivity related problems (percentage of sample) in Pakistan.*

| Major problems | Rain-fed area | Rice-wheat system (perennial | Rice-wheat system (non-perennial) | Mixed wheat systems (perennial) |
|---|---|---|---|---|
| Shortage of water | 37.1 | 38.6 | 35.4 | 39.9 |
| Expensive farm inputs | 35.7 | 26.9 | 28.1 | 28.3 |
| Loan and marketing problems | 24.8 | 17.5 | 20.3 | 18.6 |
| Damages from pests and diseases | 2.4 | 16.9 | 16.3 | 13.2 |

*Source:* Based on survey data, 2000-2002.

Four major problems highlighted by farmers are (1) shortage of irrigation water; (2) increasing cost of inputs; (3) marketing and loan problems; and (4) crop damages from pests and diseases (especially in Sri Lanka). The water shortage problem is related to the overall availability of water and its allocation/distribution, and the second and third problems relate to support measures as described above.

*Table 2. Farmer perceptions on productivity related problems (percentage of sample) in Sri Lanka.*

| Major Problems | Sevanagala, irrigated | Sevanagala rain-fed | Kiriibbanwewa | Sooriyawewa | Extension area | Ridiyagama | Irrigated all | Rain fed all |
|---|---|---|---|---|---|---|---|---|
| Shortage of water | 72.9 | 79.4 | 61.5 | 71.5 | 80.0 | 15.1 | 60.2 | 79.8 |
| Expensive farm inputs | 62.2 | 45.8 | 62.7 | 48.5 | 63.7 | 69.4 | 59.2 | 57.5 |
| Marketing problems | 55.4 | 76.1 | 6.5 | 17.1 | 83.3 | 1.4 | 23.1 | 80.9 |
| Damage from pests and diseases | 36.7 | 17.2 | 45.6 | 36.8 | 53.2 | 60.6 | 43.9 | 41.9 |

*Source:* Based on survey data, 2000-2002.

### *Shift in Approaches*

Table 3 summarizes past approaches to enhancing productivity, and the emerging focus in Asian countries. In the past, productivity was increased mainly through supply-side approaches, with the public sector playing a major role in provision of services, mostly through sectoral approaches. In consideration of mixed outcomes of past approaches, and the continuing problem of low productivity and poverty, the focus is now shifting more towards demand-side and partnership based approaches, and towards more holistic and integrated approaches.

*Table 3. Past and emerging approaches to productivity enhancements in Asia.*

| Past approaches | Emerging focus |
|---|---|
| • Development of large-scale systems, favored areas | • Small-scale systems, marginal areas |
| • Supply-side approaches | • Demand-side approaches |
| • Public sector management and financing of resources | • Public-community-private sector management and financing of resources |
| • Public sector supply of other services (credit, information dissemination) | • Public-private sector partnerships in supply of services |
| • Sectoral approaches to management | • Holistic approaches, IWRM |
| • Focus on increasing the size of the pie | • Increasing the size of the pie and its distribution |

In the past, most of the productivity enhancing agricultural services (especially technology dissemination, information/extension, credit and finance) were supplied largely by the public sector. However, the performance of the public sector in provision of these services and in reaching to the poor small farmers has been generally unsatisfactory. Huge costs involved, sectoral approaches to services provision, and inherent inefficiencies in public sector management (largely due to lack of incentives) have been the key factors limiting wider access to these services. It should be noted that currently, the issue is not so much of availability, but of access to services and factors of production-when and where they are needed. The key issue is: can these factors and services be provided through holistic approaches with the involvement of the private sector?

In the financial sector in developing countries, recent studies indicate that the provision of financial services in an integrated manner is beneficial as it enhances the efficiency of the sector and widens access to the services. However, integrated financial service provision can have risks and requires enhanced regulation and supervision in some areas, especially to prevent leakages from any publicly provided safety nets (Claessens 2002). In the agricultural sector in developing countries, the concept of integrated services provision (ISP) through private sector involvement, as an alternate to public sector provision of these services through sectoral approaches, has not been explored or promoted to any significant extent. However, over time various ISP type experiments have been carried out or similar ideas and initiatives have emerged spontaneously, though mostly on a small scale. While there are several variants of these, major practices may be classified into five categories:

1. Farmer organizations established and managed by the public sector through public sector investments-however, sustainability of these organizations is often an issue.

2. Traditional farmer cooperatives (such as those in India and Pakistan) often undertake limited activities including credit and input supply; often with limited success.

3. Modern cooperatives established and managed by the private sector, such as milk cooperatives in India.

4. Contract farming, farmer organizations and companies established and managed by the private sector through private sector investments in factories and processing plants in particular zones (such as sugarcane factories), which in addition to providing inputs and

other production-related services, provide market outlets for produce not only for members but also to non-members. However, key issues are that these require huge investments, often impose cropping pattern restrictions on farmers, and farmers may feel exploited.

5. Private sector providing major services in an integrated manner-providing information and knowledge on cultivation practices, about water and non-water-related factors, extension services, new production technologies including irrigation technologies, new seeds, fertilizers, farm equipment, credit, information on input and output prices, and markets, government policies, and latest developments in agriculture. Where output marketing services are outside their scope of operations, they help establish linkages with other private companies involved in output marketing, and processing enterprises. These are basically the so called 'one-stop shops'. New agribusinesses and agriclinics in India, and emerging agrimalls in Pakistan are examples of these entities.

Key points from the above discussion can be summarized as follows:

1. major causes of low agricultural productivity, besides land and water management factors include: (a) farmers' lack of access to good quality basic inputs such as seeds, fertilizers, and chemicals when necessary, (b) low awareness and lack of access to production-enhancing technologies, and new methods of cultivation, (c) lack of access to needed information (new techniques, necessary crop protection measures, prices, markets), (d) lack of access to finance (credit), and (e) problems related to output marketing.

2. If the above constraints are removed, there is considerable scope to increase agricultural productivity.

3. Performance of the public sector in the provision of key inputs or services has been disappointing, where access to the services have been limited mostly to large farmers and the non-poor.

4. Services by the public sector have been provided through sectoral approaches which entailed higher transaction costs, not only in provision of these services but also in accessing the services by farmers.

5. Where the private sector has been involved in provision of these services in a more integrated manner, there is evidence to suggest that access to them has widened, including access by poor small farmers resulting in improved crop productivity and reduced poverty (as will be shown in examples and case studies in the next section).

6. Overall, it can be said that many aspects of the problem of low productivity are known, solutions and key areas of interventions and actions are also known, but what is often not clear are the effective approaches, mechanisms and institutional arrangements to implement the identified interventions.

Based on the above, one may hypothesize that the key productivity and value of water-enhancing agricultural inputs and services can be successfully delivered in an integrated manner through public-private partnerships, given the right incentives and an enabling environment for private sector investments.

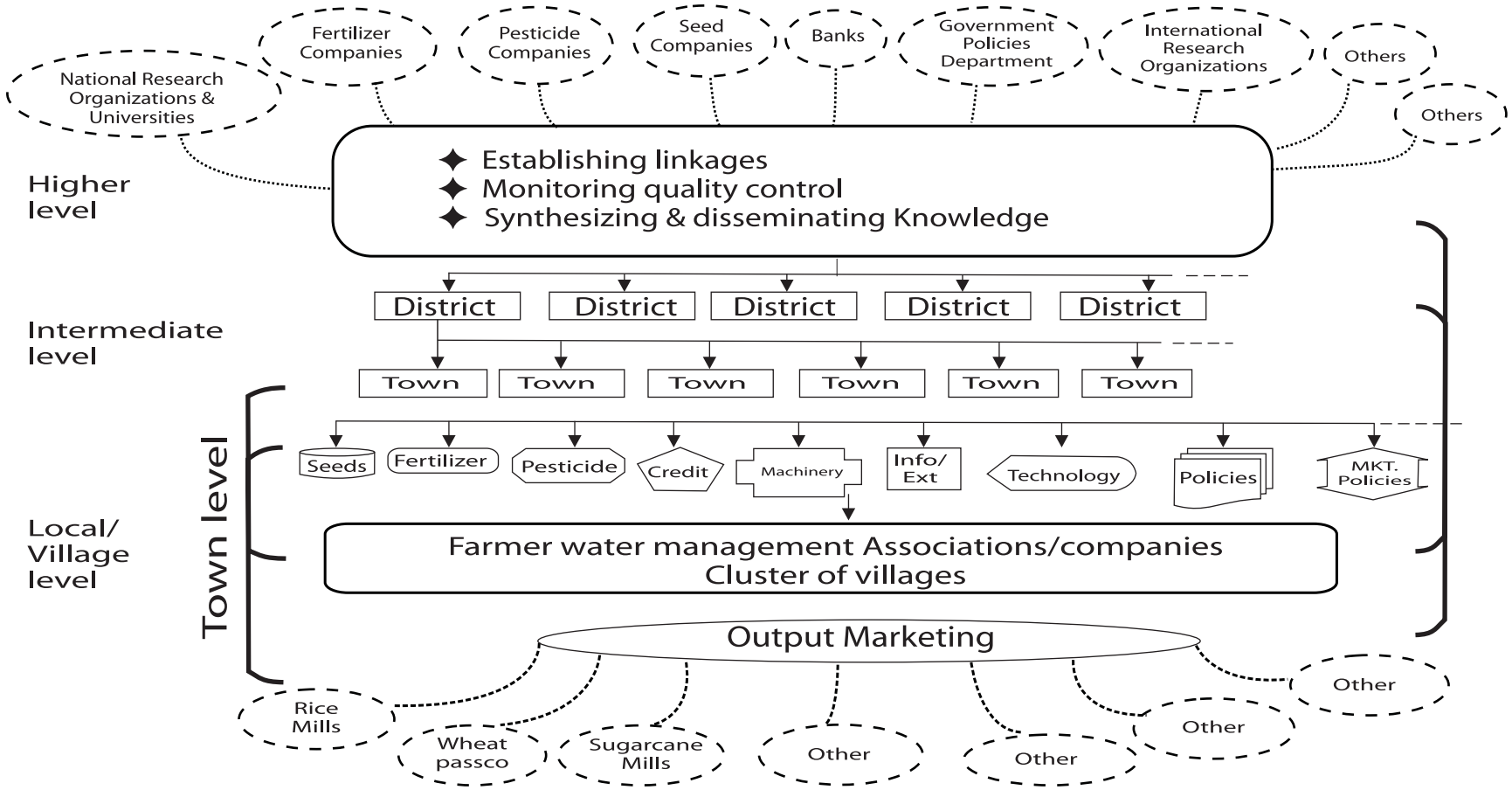
## Integrated Services Provision through Public-Private Sector Partnerships

The idea of integrated services provision in agriculture through public-private sector partnerships, as an alternate to public sector provision of services through sectoral approaches relates to three basic concerns: (1) new information, technology, production inputs, finance, and other services are often available but not necessarily accessible by a large number of farmers, especially small farmers, when and where they are needed, so the issue is not of availability but of access to these factors and services; (2) institutional mechanisms that can help provide access to these factors and services sometime do not exist or if they exist, they are often fragmentary, of poor quality, limited in capacity or scope and often inefficient, exploitative and anti-poor; (3) transaction costs of both providing and accessing these services when provided in an uncoordinated manner is often very high; (4) there is a need for institutional mechanisms that (a) ensure delivery of these services on a wider scale, (b) provide services in integrated manner so that transaction costs of service provision as well as transaction costs of accessing these services by farmers is reduced, (c) ensures that transaction costs of monitoring and quality control is low, and (d) also ensures that there are strong incentives for service providers. While the private sector can deliver services more efficiently, the role of the public sector also remains important as a regulator and facilitator. The review of international best practices in service delivery indicates that the effective initiatives are those that (a) embrace a partnership approach; (b) integrate a number of different services under the same roof, or through joint operating procedures; (c) demonstrate innovative solutions for commonly recognized problems; and (d) can be transferred to other localities and cultures (Rennie 2002).

In more simple words, the idea of integrated services provision (ISP) through private sector involvement could be viewed as a 'one-stop-shop' established at the village/town level which would provide farmers with information and knowledge on cultivation practices, extension services, new production technologies-including irrigation technologies, new seeds, fertilizers, farm equipment, credit, information on input and output prices, and help establish linkages with outputs markets, provide an update on government policies, and latest developments in agriculture-all provided under one umbrella. Technical guidance, business plans, quality control, monitoring, update on knowledge and technology and other similar functions may be carried out by apex bodies (for instance, created say at the provincial level) of the private service providers facilitated by regulatory back-up from the government. Creating and promoting such institutions would help disseminate up-to-date knowledge and information to farmers, improve access to quality inputs and finance, and reduce transaction costs for the government, farmers and society as a whole.

Based on a review of literature and some early lessons from various models and practices (presented in the next section), we provide a framework for ISP through public-private sector partnerships (particularly with reference to Paksitan). The suggested institutional arrangement may consist of (1) apex body of service provider-whose functions may include dissemination of research-based up-to-date knowledge, quality control and monitoring, attracting private investments in provision of inputs and services, establishing linkages with inputs and service suppliers including financial institutions and facilitating linkages with output market channels; (2) intermediate/district-level body of service providers-for implementation of the above functions at intermediate level; and (3) local/town/village-level one-stop-shops, providing a range of inputs and services. Farmers/water user associations or water management companies may be linked to these entities at various levels (figure 1). Under this framework, the public sector role would be to provide regulatory back-up and facilitation in terms of funding for initial investments and in establishing linkages with various entities including public and private agencies such as research organizations, financial institutions, seed companies and so forth.

*Figure 1. Suggested framework for integrated services provision in agriculture in South Asia (with special reference to Pakistan).*



## Some Examples of Models and Good Practices in Integrated Service Provision

### 1. Food and Agriculture Organization of the United Nations (FAO)-Food Security Pilot Project in Pakistan

*"A major breakthrough in wheat Yield: When a crop assessment official announced from the rostrum that the average wheat yield had gone up to 51.62 maunds per acre, the jampacked pandal for the 'farmers' day' broke into loud and spontaneous clapping." (Dawn 26 April 2000).*

In 1998, the Ministry of Food, Agriculture and Livestock (MINFAL) in collaboration with the provincial governments of Punjab, Sindh and Northwest Frontier Province (NWFP) launched a food security project to increase crop productivity, with a focus on increasing productivity of wheat and rice. The overall objective of this project was to supplement the country's ongoing efforts to increase food production to improve national food security and meet the rapidly growing food demand as well as to reduce seasonal and year-to-year variability in production on an economically and environmentally sustainable basis. FAO provided financial assistance for this project in response to the World Food Summit Plan of Action, 1996. During phase I, the project was implemented at the watercourse level in the village of Malo-Mahay in Daska Tehsil of Sialkot District, and Chak SB 44 in Sargodha district of Punjab and 'Loke' village in D. I. Khan district of NWFP.

Under this project, farmers were organized into groups/organizations, where they were provided access to: (1) improved seed varieties, (2) quality fertilizers, and weedicides, (3) credit for buying inputs, (4) farm equipment and machinery (5) technology such as laser land leveling and other water saving techniques (6) agricultural extension services/ information on timing and application of inputs, etc. (by appointing an agricultural extension advisor). Essentially, all these inputs and services were provided to farmers in integrated manner (all under one roof). This integration of services has not only improved access, but also reduced transaction costs of accessing these services. Project evaluations indicate that productivity at village level of the first wheat crop (1998-1999) increased by 51.5 percent at Daska and 28 percent at Sargodha over the base productivity level. Productivity of the second wheat crop (1999-2000) increased by 61.5 percent and 62.9 percent at Sargodha and Daska sites, respectively. At the D.I. Khan site productivity increased by 168 percent during rabi 1999-2000. In 2000-2001, IWMI undertook a detailed study at the Sargodha site, comparing productivity in the village/watercourse with FAO intervention and in the adjoining villages/watercourses without interventions. The study found that the intervention has led to significantly increased cropping intensity and crop yields. Land leveling techniques enabled farmers to save water and increase irrigated area by 15 to 20 percent. A combined technological and institutional package has created conditions for farm households to increase crop productivity. For ensuring future sustainability of the project, Input Sale Center (ISC), Farm Services Center (FSC) and a Revolving Fund Account (RFA) have been established at each village under the supervision of voluntary organizations. However, it is not clear how and whether these new institutions will be sustainable. In phase II, the project is now being replicated in 100 villages in the country.

Lessons: There is a significant scope to increase crop productivity, farmers are responsive, integration of inputs and services reduces transaction costs of providing and accessing services, new technologies can be spread more quickly if they are integrated into a broader set of inputs and services.

Issue: The key issue is the sustainability of new institutions. Unless, strong linkages are established across these institutions and mechanisms are developed so that there are incentives for services providers, these institutions are unlikely to be sustainable in the long run.

## 2. 'Agrimalls' in Pakistan-a new concept of integrated services provision in the Indus basin

As mentioned earlier, low crop productivity continues to be one of the major problems in the agricultural economy of Pakistan. For example, average productivity per hectare of wheat in Pakistan (a major food grain crop in the country) of 2325 kg/ha is the lowest among major wheat producing countries such as Egypt (6357kg/ha), Mexico (4549 kg/ha), China (3860 kg/ha) and India (2742 kg/ha). The major causes of this low productivity, besides land and water-related issues, are lack of access to good quality inputs such as seeds, fertilizers and chemicals, lack of awareness and access to productivity enhancing technologies, lack of access to information related to crop protection measures, new methods of cultivation, prices and output markets, and lack access to finance.

In 2003, the private sector in Pakistan took initiatives to provide a range of farm inputs and services in an integrated manner through the establishment of what are called 'agrimalls' (or one stop centers) through a network of franchisees. This business venture, where one company is taking a lead, have three entities, franchiser (lead company), franchisees and financial institutions. The franchiser or the parent company's functions include issuing licenses with brand names, providing dealers access to a range of inputs and services, training franchisees on various aspects of business, and standardizing the franchises through provision of management information systems and standard operating procedures and assist in securing loan funding for infrastructure establishment.

Franchises are to be operated at the union council level (lowest administrative unit), where a range of inputs and services are to be provided in agrimalls (including good quality seeds, fertilizers, pesticides, farm equipment/machinery through rental services, credit through banks, technical advice, information, training, consulting services and outlets for farm produce) through partnerships with major companies/ agencies (including Ali Akbar Enterprises for crop protection, Engro Chemicals Pak Ltd., Millat Tractors Ltd., Pakistan State Oil, Punjab Seed Corporation, and United Bank Ltd.). The franchisees at the union council level will have all the necessary infrastructure and will earn through rental business (machinery), commission business (sale of seeds, fertilizers, pesticides), and services such as soil and water testing, pest scouting and so forth. Under this model, the financial institution will interact with franchisees for their business needs, and with farmers for their input requirements. The financial institution would achieve effective coverage through a group of farmers rather than approaching farmers individually, and will have access to records through franchisees as these will act as facilitators. It is expected that farmers would benefit through enhanced access to inputs and services 'at the right price, right quality, right quantity and right time'. This new initiative is in the process of being implemented. Will this initiative widen access to quality inputs and services? Who will benefit from this initiative, poor smallholders, large farmers, or all farmers? What would be its impact on agricultural productivity, and returns to farming? How successful would be this initiative as a business venture? These questions will need to be answered 4 to 5 years after 'agrimalls' become operational on a wider scale. However, the immediate concern is that without regulatory support, and facilitation in cross-agency linkages, and an overall enabling environment created by the government, the idea may take a long time to mature or may not be successfully implemented on a wider scale. Also, some supervision and monitoring by public authorities and regulation will be needed to ensure quality control and to minimize potential exploitation of farmers.

### 3. Emerging Agriclinics and Agribusiness Centers in India

The unique nationwide project on 'Agriclinics and Agribusiness Centers' was initiated in early 2002 by the Indian Ministry of Agriculture in association with the National Bank for Agriculture and Rural Development (NABARD). The project aims to enhance access to inputs and services for farmers, in addition to providing employment opportunities to agricultural graduates. Agriclinics are expected to provide expert advice to farmers on cropping patterns, technology dissemination, crop protection measures, information related to prices and market trends, and clinical services for animal health. Agribusiness centers are expected to provide a range of inputs and farm equipment on hire and other related services. The range of services offered is broad in 20 sub-projects including soil, water and input testing laboratory services, maintenance, repairs, and hiring of agricultural equipment, including micro irrigation systems (such as sprinkler and drip), access to advice on farm management (either through field visits or the internet), access to good quality inputs, access to credit, and access to a transparent commodity purchasing system. Under this project, 'agripreneurs" (agri-graduates) are being provided startup training on establishing the centers, and loans amounting to Rs 1 million for individuals and Rs 5 million for a group of around 5 (with repayment within 5 to 10 years in concessionary installments) from NABARD.2 Under the project, farmers who use the services pay a fee established by agripreneurs. By the end of 2002, 15,609 graduates representing all Indian states have applied, and 2,853 graduates have either completed or are undergoing training through a network of 57 training institutes countrywide. By December 2002, 235 agripreneurs started agriclinics or agribusiness centers in small villages. While the initial results appear good, it is too early to make an assessment of the success of this initiative (for more details on success stories see MANAGE 2002).

### 4. Contract Farming of Sugarcane in the Walawe Left Bank Irrigation System, Sri Lanka

Recently Hussain et al. (2003) undertook a detailed study on the impact of access to irrigation infrastructure on poverty alleviation in the Walawe Left Bank (WLB) irrigation system in the Walawe basin, located around 200 km southeast of Colombo, in Sri Lanka. The Sevenagala area, which is famous for sugarcane cultivation, was also included as one of the study sites. This area presents an example of contract farming with integrated service provisioning under irrigated and rain-fed conditions. Households have been allocated an equal extent of land for the cultivation of sugarcane, and paddy to a limited extent. Under long-term legally binding lease arrangements, farmers grow sugarcane and sell the output to the sugar mill, now a private sector establishment, located in the vicinity of the study site. All inputs including seed, fertilizer, chemicals, agricultural equipment, credit, irrigation water, and services such as information, transportation, marketing are provided to the farmers by the sugar mill, through deferred cost recovery arrangements mutually agreed upon by the farmer organization and the mill management. The mill in turn is obliged to procure the entire output at per-negotiated/settled prices. The timings of sugarcane plantation, its harvesting, transportation, threshing, etc., are coordinated by the mill management but after due consultation with the farmers. These arrangements have culminated in very high impacts on crop productivity, income, employment, and food security, and consequently larger reductions in poverty than other settings with similar access to irrigation water but with no service delivery arrangements- or those adjoining Sevanagala with basically the same setting with the same service delivery arrangements but with no access to irrigation water. For example, household average annual income

in Sevenagala is US$1,001 compared to other adjoining sites where household average annual income is US$805 to US$968. Chronic poverty in Sevenagala is the lowest in the area-estimated at 19 percent, whereas in other nearby sites, it ranges from 27 to 35 percent.

## 5. Farmers Company in Ridi Bendi Ela Irrigation System, Sri Lanka

The formation of farmer companies was recommended as an alternative institutional arrangement for farmer organizations to improve the agricultural productivity and the livelihood of farmers through commercialization of small farm agriculture by the Working Group on Agricultural Policy of the National Development Council (NDC) set up by the Sri Lankan government in 1995. With the understanding that the government bureaucracies alone are not very effective in managing irrigation systems, participatory irrigation management (PIM) that involves farmers in managing irrigation systems was introduced as an alternative. The government adopted PIM as a policy in 1988, which included the formation and development of farmer organizations (FOs), and turning over of operation and maintenance (O&M) responsibilities to FOs at the tertiary level (Vermillion 1991). But performance evaluation studies carried out have indicated various drawbacks in PIM approaches. FOs remained unable to ensure overall economic and social wellbeing of small farmers through profitable economic ventures. The formation of farmer companies was recommended as an alternative institutional arrangement for the FOs. Farmer companies were considered appropriate institutions to bring about necessary changes at the irrigation system level to commercialize smallholder agriculture.

The Working Group on Agriculture Policy of the NDC stated in their recommendations that, although certain farmer organizations have emerged as forceful pressure groups in irrigation settlements where they managed to organize water distribution, input supply, and in a limited way, sale of production, a major breakthrough was not seen to ensure small farmers' economic and social wellbeing through profitable economic ventures. The absence of a combined set of interventions to promote year-round cropping, crop scheduling, value-added production and other agro-industries and market links in the form of forward contracts of sufficient scale as profitable business for farmer organizations and absence of procedures for decision making in the implementation of trade policy sensitive to farmers promoting partnerships between state and farmer organizations remained as obstacles. Investments through organized farmer efforts such as companies can produce competitive economic ventures for which a necessary condition will be partnerships with the private sector and the state. Also, the farmer companies can tangibly address the problem of inadequacies of income-earning opportunities for landless rural youth and also harness the skills of educated youth (NDC 1996). Almost 80 percent of Sri Lanka's population live in rural areas and these are predominantly agricultural. Modernization and commercialization of agriculture and agro-based industries could substantially contribute to the employment and income goals of the country and in turn would help maintain rural-urban migration at a favorable level (Wijeratne 1996).

Farmer companies was expected to undertake all the services provided by government agencies including water distribution, dissemination of agricultural technology and making effective market arrangements. The other changes proposed to facilitate this process include, granting of individual water and land rights with freehold titles to land so that it is governed by open market policies. The overall government objective of pilot testing of farmer companies was to learn lessons for implementing the new policy on commercialization of smallholder agriculture. Hence, the NDC decided to conduct pilot programs on the concept of farmer companies in two major irrigated agricultural systems in the country-Ridi Bendi Ela and Uda Walawe.

*Formation of the Company*

The Ridi Bendi Ela Farmer Company was established as a people's company with limited liability under the Companies Act No. 17 of 1982 in September 1998. The idea behind setting up the farmer company as a people's company is to restrict the total private ownership and safeguard the existing employee rights. According to the Companies Act a farmer company formed as a people's company, unlike other private companies, must be incorporated by no less than 50 members. Its shares cannot be freely traded except among farmers eligible for membership. It restricts a single farmer from owning more than 10 percent of the share capital. Nonetheless, as a profit making company it follows rules, practices and procedures of other private companies such as registering with the Registrar of Companies, appointing an audit firm and a registered corporate secretary, undertaking annual audits, keeping accounts, taxation, holding of annual general meetings, etc. The specific objectives of the Ridi Bendi Ela Farmer Company are:

1. providing necessary technical support and other requirements to improve the living conditions of the landowners, tenants, and those involved in agriculture related businesses in the scheme

2. timely provision or facilitation in the provision of agricultural inputs either in wholesale or retail

3. provision or facilitation in the provision of agricultural credit

4. supply or facilitation in the supply of agri-equipment and related inputs

5. reaching agreements with relevant agencies for O&M of the irrigation system and for providing water for agriculture

6. implement agricultural extension services and research for the development of agriculture and/or coming into agreements with relevant agencies for providing such services

7. introduce new agro-processing, packing and transporting methods and preserving techniques and agro-based industries

8. wholesale purchasing, storing, selling or exporting the total agricultural production in the area

9. introducing new agricultural technologies and new seed varieties

10. solving all the production- and marketing-related problems of producers and coordinate with state and private agencies to provide a maximum price for the products

11. improving living conditions of agricultural producers by making necessary arrangements to produce on market demands and by commercializing the production process

12. making arrangements to solve the rural unemployment problem by providing necessary inputs and services for introducing labor intensive production and export-oriented industries

13. introduce animal product industries or related investors to the project area in order to generate employment

14. prepare and implement agricultural plans with the participation of farmers

15. make necessary arrangements for the maximum utilization of local resources in the production process

***Ridi Bendi Ela Irrigation System***

The Ridi Bendi Ela irrigation system is located within the Nikaweratiya Divisional Secretary (DS) division in the Kurunagala district, a major part of which is in the Deduru Oya river basin (figure 2). Ridi Bendi Ela is an ancient irrigation system, which dates back to the second century BC and renovated around 1950. The reservoir of the system, the Magalla Wewa, receives water from an anicut built across Deduru Oya. The total capacity of Magalla Wewa is 7,480 ac. ft (9MCM). It has a left bank (LB) and a right bank (RB) canal and a middle canal. There are also some direct irrigation outlets from the feeder canal. The total command area of the system is 2,483 ha which includes some areas cultivated under the feeder canal. Most of the irrigation structures in the system are dilapidated. Ridi Bendi Ela is not a water short system. The total number of farming families living in the system is 2,769. In Maha (major cultivation) season, almost the entire area is cultivated, in Yala (minor cultivation) season, only about 75 percent of the area is cultivated. Since 1984 the Ridi Bendi Ela irrigation system has been managed under the Integrated Management of Major Irrigation Schemes (INMAS) program that introduced PIM to irrigation system management in the country.

*Figure 2. Ridi Bendi Ela irrigation system.*

### *The Farmer Company Model*

The blueprint model for establishing farmer companies proposed by the NDC included a national-level farmer company and 50 satellite farmer companies either at district, Agrarian Service Centre, watershed or similar levels. The main task of the national-level company was envisaged to be mainly import and export of major products. The company is expected to work in collaboration with the government to monitor production of major crops and enterprises in the agricultural sector. The company, using profits, will gradually expand business and move into areas such as: large scale processing and storage, marketing, manufacturing of agricultural machinery and equipment etc. The satellite companies would be commercially organized bodies of entrepreneurial farmers. However, what was planned in the original model was not implemented in establishing the pilot company in Ridi Bendi Ela. It is an independent autonomous company like any other people's company.

The formation of the Ridi Bendi Ela farmer company by the IMD involved several activities as outlined in table 4.

*Table 4. Process followed in the formation of the farmer company in Ridi Bendi Ela*

| | Activities | Month |
|---|---|---|
| 1. | Awareness for agency officials | June 1997 |
| 2. | Awareness for local politicians | June 1997 |
| 3. | Field visit of FRs to Huruluwewa farmer company | June 1997 |
| 4. | Awareness for FRs | July 1997 |
| 5. | Field visit of FRs to Dambadeniya farmer company | July 1997 |
| 6. | Awareness for farmers | July 1997 |
| 7. | Conducting baseline survey | Sept. 1997 |
| 8. | Briefing FRs on formation of farmer company, discussion on company law, and preparation of Articles of Association | Oct. - Nov. 1997 |
| 9. | Calling for share applications | Feb. 1998 |
| 10. | Appointment of board of directors | March 1998 |
| 11. | Registration of the company and certification for commencing business | April 1998 |
| 12. | Collection of share capital | March 1998 |
| 13. | Training for board of directors | March 1998 |
| 14. | Commencement of business activities | May 1998 |
| 15. | Provision of office building and handing over of assets | June 1998 |
| 16. | Provision of first year capital and operational cost | June 1998 |
| 17. | Holding of first general meeting | July 1998 |
| 18. | Recruitment of staff | Sept. 1998 |
| 19. | Preparation of the MOU for handing over O&M | Aug. 1999 |
| 20. | Signing of the O&M tri-partite agreement | Feb. 2000 |
| 21. | Implementing system operation and maintenance | March 2000 |

*Note:* FR = farmer representatives

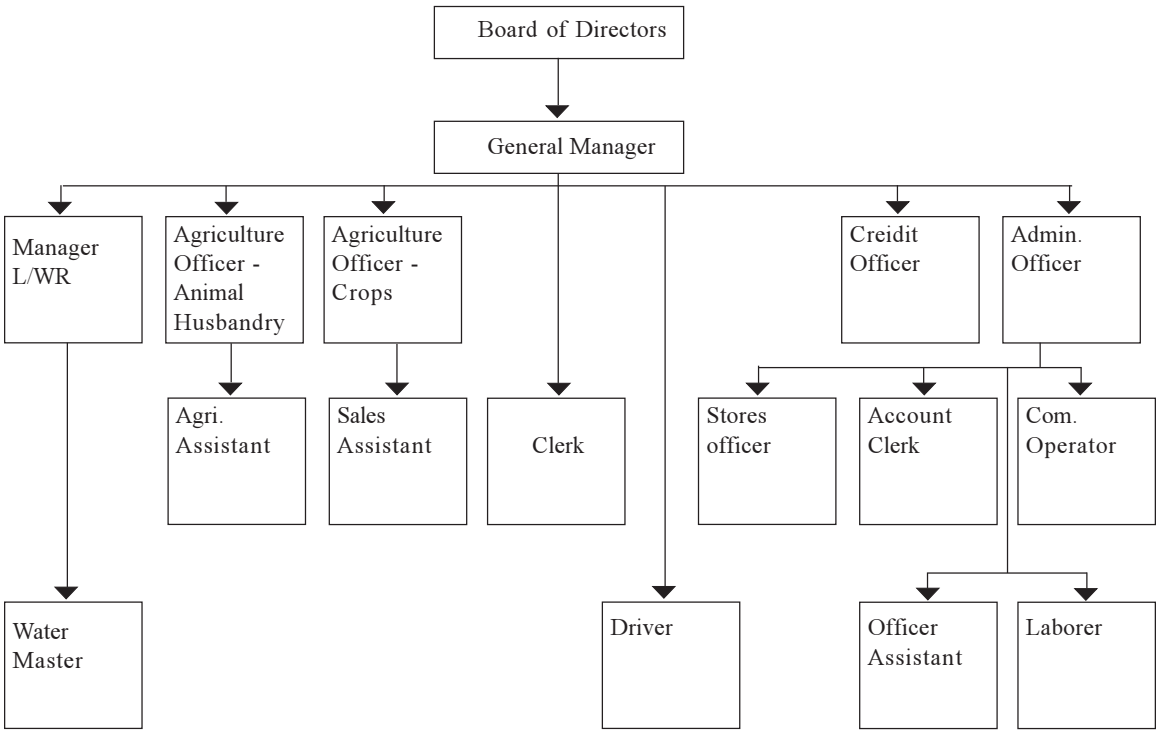
The key feature in the formation of the company was the provision of seed money to start its business activities, and the operation cost for three years by the government. A total of Rs 10 million was provided to the company as seed money and another additional Rs 7 million as operational costs

for the first three years by the government. Apart from that the company was provided with a building that belonged to the Department of Irrigation and some storage space that belonged to another government agency.

### *Structure of the Company and Staffing*

The company operated as a single-lined organization and was restructured during 2001 by dividing it into 5 sections: Operation and Maintenance, Agricultural Crops, Animal Husbandry, Credit and Marketing, and Administrative and Accounts. The present structure of the company devised by the General Manager resembles that of a matrix organization with functional sections operating with some flexibility and independence (figure 3). The company management includes 7 members of the Board of Directors (BOD) and a General Manager. The BOD members are selected annually at the annual general meeting of the company members. A director can serve for a period of 3 years, unless the members decide to change him at the annual meeting. Since almost all the members of the company are farmers of the irrigation system the members of the BOD are exclusively selected from among farmers.

*Figure 3. Organizational structure of the Company*




### *Share Holding and Share Capital Development*

According to the Articles of Association anyone who is involved in agriculture-related activities could become a member by way of purchasing shares. The value of each share is Rs 10. However, members of the BOD finally decide the eligibility of the members. Due to this, the company

membership is exclusively limited to legal or tenant farmers of the RBE irrigation system. Shares are purchased for the sole purpose of involvement in company activities that bring benefits rather than to make an investment. Though shares are an important means for building up the share capital, the company does not launch specific programs for increasing shares. It is mainly due to the belief that it would not contribute much to the total capital investment of the company. The company lacks interest in increasing the share capital because the government has provided seed money to run the company. By maha season 2001, 1,898 farmers (or 71 percent of all farmers in the system) had purchased company shares.

### *Company Activities*

The company started many business activities proposed either by agency people or the members of the BOD at the beginning and implemented them on a trial and error basis, without any proper business plan and without identifying core business activities. Out of them some successful activities were selected as its main ventures based on the experience. Most of the initial activities attempted on trial and error basis failed (table 5) but the failure of most of them had no significant financial impact as they were implemented on a very small scale.

*Table 5. Company activities from commencement of operation.*

| Activity | Commenced | Profitability | Linkages/partner | Present status |
|---|---|---|---|---|
| 1. Seed paddy farming | Yala 1998 | Profitable | Dept. of agriculture | Continuing |
| 2. Supply of fertilizer | Yala 1998 | Profitable | Fertilizer company. | Continuing |
| 3. Inland fishery | Maha 1998/1999 | Loss | Own | Failed |
| 4. Group loan program | Maha 1998/1999 | Profitable | Own | Continuing |
| 5. Growing quality vegetable | Maha 1998/1999 | - | Own | Failed |
| 6. Poultry farming | Maha 1998/1999 | - | Poultry producer company | Continuing |
| 7. Perennial crop development | Yala 1999 | - | Dept. of Agriculture | Failed |
| 8. Growing white sesame | Yala 1999 | - | Private company | Failed |
| 9. Supply of seed Mung | Yala 1999 | - | Own | Failed |
| 10. Growing Passion Fruit | Maha 1999/2000 | - | Private company | Failed |
| 11. Integrated farm | Maha 1999/2000 | - | Own | Failed |
| 12. Growing Soya | Yala 2000 | Private company | Failed | |
| 13. Supply of agro-chemicals | Yala 2000 | Profitable | Private company | Continuing |
| 14.Redeeming mortgaged lands | Yala 2000 | - | Own | Stopped |
| 15. Growing papaw | Maha 2000/2001 | - | Own | Failed |
| 16. Growing soya | Maha 2000/2001 | - | Private company | Failed |
| 17. Combined harvester | Maha 2000/2001 | Loss | Own | Failed |
| 18. Rearing ornamental fish | Maha 2000/2001 | Loss | Private company | Failed |
| 19. Vegetable seed program | Maha 2000/2001 | Profitable | Private company. | Continuing |
| 20. Maize cultivation | Yala 2001 | Profitable | Own | Not continued |
| 21. OFC cultivation | Yala 2001 | Profitable | Own | Not continued |
| 22. Gherkin cultivation | Maha 2001/2002 | Profitable | Private Co. | Continuing |
| 23. Milk cow program | Maha 2001/2002 | - | Own | Continuing |
| 24.Basmathi paddy cultivation | Maha 2001/2002 | Profitable | Own | Continuing |
| 25. Peanut cultivation | Maha 2001/2002 | - | Continuing | |

The present core business areas of the company include: (1) credit and input supply; (2) agriculture and animal husbandry; and (3) irrigation system management. The main activities implemented by the company under the credit and input supply, and agriculture and animal husbandry are given in table 6. The minor activities of the company are given in table 7.

*Table 6. Main activities carried out by the company.*

| Activity | Linkage | Investment (Maha 2001) | Profitability | Gross Profit | Interest rate | Risk level |
|---|---|---|---|---|---|---|
| Group loan program | Own program | Rs 5,250,683 | Profitable | * | 10% | High risk |
| Redemption of mortgaged lands | Own program | Rs 1,228,500 | Newly commenced | - | | Risk |
| Credit seed paddy | Own program | Rs 142,438 | Profitable | Rs 14,905 | 10% | Risk |
| Fertilizer supply | Fertilizer Ltd. | Rs 3,408,551 | Profitable | Rs 117,419 | 3% | No Risk |
| Agro-chemical supply | Private company | Rs 1,628,141 | Profitable | Rs 150068 | 9% | No Risk |
| Seed paddy program | Own | Rs1,192,827 | Profitable | Rs 325,244 | 27% | Low risk |
| Poultry farming | Private company | 477,709 | Loss | * | Risk | |

*Note:* 1US$ = Rs 90 in 2002.
*Records were not updated.

*Table 7. Minor activities of the company.*

| Activity | Partners | Degree of success |
|---|---|---|
| Retail outlet | No | Continuing with some success |
| Vegetable seed production | No | Continuing with some success |
| Gherkin cultivation | Private company | Facilitation |
| Peanut cultivation | No | Continuing with some success |
| Basmati rice cultivation | No | At initial stage |
| Piggery program | Private company | At initial stage |
| Milk cow program | No | Facilitate by providing credit |

### *Irrigation System Management*

The management of Ridi Bendi Ela irrigation system has come under the responsibility of the farmer company since yala 2000. This responsibility was assigned to the company under a tri-partite agreement signed among the Department of Irrigation (ID), System Level Farmer Organization (SLFO) and the farmer company. This agreement transferred operation and maintenance responsibilities of the irrigation system below the main sluices (including the ownership rights of the irrigation infrastructures below the main sluice) to the farmer company through the SLFO for a period of three years. The company recruited its own staff, a manager for water resources and land (WR/L) and three gate operators for this activity.

### *Improvements Following the Formation of the Company*

The significant changes that took place following the company's takeover of the system management responsibilities include: (1) reduction in the head-tail disparity in water distribution; (2) improvement in farmer involvement in decision making; (3) improved cultivation due to integrated service provision (water, credit, inputs and technical advice); and (4) unlike the government institutions, the company has more responsibility and accountability to make the seasonal agriculture programs successful by reliable and timely supply of water and other inputs required by the farmers. A farm-level survey conducted by IWMI at the end of year 2000 revealed that most of the irrigation problems that farmers used to experience during the yala season were minimized after the company took over the O&M responsibility (table 8).

*Table 8. Irrigation problems before and after the formation of the company.*

| Problem | Before | | After | |
|---|---|---|---|---|
| | Yala | Percentage | Yala | Percentage |
| Inadequacy | 27 | 19 | 15 | 11 |
| Timeliness | 8 | 6 | 1 | 1 |
| Unreliability | 4 | 3 | 2 | 1 |
| Water stealing | 19 | 14 | 8 | 6 |
| Violation of rotation | 10 | 7 | 3 | 2 |
| Water wastage | 23 | 16 | 6 | 4 |
| Structure problems | 7 | 5 | 6 | 4 |
| Total | 98 | 70 | 41 | 29 |

As a result of the company's efforts, cropping intensity and overall land productivity has improved in the system. The company was successful in introducing a third (mid-season) crop, resulting in overall increased cropping intensity (table 9). It should be noted that attempts made previously to introduce a third crop in the same area failed, as the plans lacked arrangements for irrigation water supply.

*Table 9. Cropping pattern and cropping intensity.*

| Season | Cultivation area (ha.) | | | Crop intensity |
|---|---|---|---|---|
| | Paddy | Other food crops (OFCs) | Mid seasonal crop | |
| Yala 1999 | 1,658.30 | 14.17 | - | 1.69 |
| Maha 1999/2000 | 2,421.05 | 8.10 | - | |
| Yala 2000 | 1,611.34 | 10.12 | - | 1.67 |
| Maha 2000/2001 | 2,412.96 | 16.19 | - | |
| Yala 2001 | 1,569.23 | 141.70 | 48.58 | 1.72 |
| Maha 2001/2002 | 2,400.00 | 29.15 | - | |
| Yala 2002 | 1,658.30 | 323.89 | 60.73 | 1.84 |
| Maha 2002/2003 | 2,419.03 | 10.12 | | |

Overall, after establishing the company, water management in the system improved, and access to key production inputs has widened. It may prove to be a better alternative to FOs, provided that some limitations and concerns are addressed. These include: (1) company has no linkages with a higher level body, the apex body as proposed in the original plan was never created, and the company works in isolation (without any links even with parallel agencies); (2) there are no linkages with other agencies for providing inputs and services to farmers, including with agriculture-related agencies; (3) company is taken as a panacea to all farmer problems, making it difficult for the company management to focus on core activities; (4) company's activities are limited, activities such as marketing of products, establishing agro-based industries and value addition to farm produce, have not been initiated; (5) company depends on government financial assistance; and (6) most importantly, the originally proposed model, which envisaged an apex body, was not implemented. Unless, appropriate linkages are created, and other concerns are addressed, the success of the initiative will remain uncertain.

## 6. Service Delivery at Grassroots Level in China

In China, service delivery in agriculture is carried out through agro-technical extension centers (ATEC) which operate at national, provincial, prefecture, county and township levels. County agro-technical extension centers (CATECs) and township agro-technical extension stations (TATES) provide services at the grass-root level. For commercialized agricultural services, CATECs and TATES have commercial input supply shops and agricultural enterprises such as corn processing and rice milling facilities, and demonstration farms that sell seed and nursery products. TATES staff also provide specific services to farmers in the village, such as information on new production technologies, plant protection measures, better access to high quality production inputs and marketing-related information. These services are fee based, where the TATES director signs a contract for delivery of services with the village head. The services are provided directly to individual farmers in the village or through a village committee, and a fee is paid at the end of each season. During 1993-2002, the World Bank under the Agricultural Support Services Project (ASSP) organized farm households into farmer associations (FAs), and by 2001, 13,360 new FAs were organized at the village and township levels in 700 townships. For advanced technical, marketing and management information, FAs contract with universities or specialized consultants for advice and training, and FAs finance all the associated costs.

## 7. Farmer Controlled Enterprises and Contract Farming in Sub-Saharan Africa

Coulter et al. (1999) undertook a study in eight African countries to assess the viability of two approaches to improving agricultural services provision: (1) contract farming-which refers to a range of initiatives taken by private agri-business companies to secure access to smallholder produce; companies provide services to farmers and in return receive access to some or all of farmers' produce. The schemes involve provision of inputs (seeds, fertilizers and pesticides) on credit, often with extension advice, and other related services. Cost is recouped when the produce is sold; and (2) cooperation through formal cooperatives (different from state controlled cooperatives of the past)-farmer associations or groups, collectively known as farmer controlled enterprises (FCEs). Successful FCEs are generally involved in input supply, credit operations and simple marketing, and tend to concentrate on relatively high value produce. They are generally built on pre-existing organizations where members already share considerable trust and familiarity, tend to be small in size (10 to 30 members of homogenous characteristics), with a clear member-driven agenda, strong democratic process, written rules, and record keeping, and a high degree of self-financing. The study suggests that the marriage of contract farming and farmer cooperation has the potential to effectively deliver agricultural services to smallholder farmers, enabling an intensification of production and diversification into more profitable cash crops. The government can encourage initiatives by providing an enabling environment for private-sector activities, including provision of rural infrastructure.

## 8. Examples from Other Countries

Rennie, Greller and Mackay (2002) provide a review of international best practices in service provision to remote rural areas, and describe a number of examples from English-speaking countries and other European countries. According to their review, key areas of best practices include initiatives that : (1) embrace a partnership approach, particularly those that empower the community and user groups in decision making and planning; (2) integrate a number of different services under the same roof, or through joint operating procedures; (3) demonstrate innovative solutions for commonly recognized problems; and (4) can be transferred to other localities and cultures. Rural transaction centers in Australia, One-Stop-Shops in Warwickshire and Worcestershire, England and Multi-service Rural Shops in Europe are some of the examples of best practices in integrated service provision.

## 9. Summary and Conclusions

This study forms part of the ADB funded multi-country project on "Pro-poor Intervention Strategies in Irrigated Agriculture in Asia" implemented by IWMI in collaboration with national partners in six Asian countries: Bangladesh, China, India, Indonesia, Pakistan and Vietnam.

Enduring low agricultural productivity is one of the major causes of rural poverty in south Asia. Based on a review of recent empirical studies, this paper focuses on three key questions: (1) why is agricultural productivity low in the region?; (2) what are the key constraints and opportunities for enhancing agricultural productivity; and (3) what are the effective mechanisms to improve access to key productivity enhancing technologies, factors and services? Two major points raised in the paper are that: (a) improved management of land and water is important for increasing productivity, but

equally important is farmer access to non land and water related inputs and services, which through their complementary relationships with water, increase the productivity and value of water. Even if most of the constraints related to land and water are removed through improved management, resulting gains in productivity may not be sufficient-in the presence of constraints related to other factors and services-to have any significant impacts on poverty. Therefore, in order to bring any major increases in productivity, farmers' improved access to non land and water factors and services is also important; (b) access to these factors and services can be improved through their provision in an integrated manner with public-private sector partnerships. Based on examples of various models, initiatives and practices from Pakistan, India, Sri Lanka, China, Sub-Saharan Africa and other countries, the study suggests a framework for integrated services provisioning in the agricultural sector.

The paper provides an overview of the issues, broad assessments of a few cases, and makes some suggestions. However, in order to recommend an effective approach to service delivery in agriculture in South Asia, more in-depth research is needed on various initiatives and models, their functioning, institutional arrangements, their successes and failures. The key questions to be answered may include the following: What certain types of institutional arrangements are more effective in delivering major agricultural services in an integrated manner? Who are the main beneficiaries of ISP-type initiatives by the private sector? Have these practices and initiatives by the private sector resulted in improved access to these services by the poor? Are there any issues related to private sector exploitation of farmers, especially the poor? What are the necessary conditions for successful delivery of these services in an integrated manner though the private sector? What are the profitability levels in agribusiness and in agriculture, in general, and under a given profitability scenario, are there sufficient incentives for the private sector to make investments? What are the costs and benefits of integrated services provision? What are the constraints and opportunities for replicating the practices experimented with so far? Further research may develop a detailed inventory of various experiments, models, interventions and initiatives carried out both by public and private sectors. The menu of identified cases may be divided into a number of groups/categories, based on a set of criteria such as public, private or joint ownership;, organizational and management structures; size, scale and nature of operations; size of investments; incentive system; and benefits to farmers, especially the poor.

## Literature Cited


Chand, R.; Haque, T. 1998. Rice-wheat cropping system in the Indo-Gangetic region: Issues concerning sustainability. *Economic and Political Weekly,* June 27.

Claessens, S. 2002. "Benefits and costs of integrated financial services provision in developing countries." Paper presented at the joint Netherlands-US roundtable on financial services conglomerates, 23-25 October 2002, Washington D.C.

Coulter, J.; Goodland, A.; Tallontire, A.; Stringfellow, R. 1999. *Marrying farmer cooperation and contract farming for service provisions in a liberalizing Sub-Saharan Africa.* London: Overseas Development Institute (ODI) U.K.

Hussain, I. 2003. "Alleviating rural poverty in Pakistan." Paper presented at National Workshop on Pro-poor Intervention Strategies in Irrigated Agriculture in Pakistan, 23-224 April 2003, Islamabad, Pakistan.

Hussain, I.; Marikar, F.; Thrikawala, S. 2002. *Impact assessment of irrigation infrastructure development: A case study from Sri Lanka.* JBIC Research Paper 19. Tokyo, Japan: Japan Bank for International Cooperation.

Hussain, I.; Sakthivadevel, R.; Amarasinghe, U.; Mudasser, M.; Molden, D. 2003. *Land and water productivity of wheat in the western Indo-Gangetic Plains of India and Pakistan: A comparative analysis.* IWMI Research Report 65. Colombo, Sri Lanka: International Water Management Institute.

Hussain, I.; Hanjra, M. A. 2003. Does irrigation water matter for rural poverty alleviation? Evidence from South and South-East Asia. *Water Policy Journal,* Special Issue (forthcoming).

Hussain, I.; Nazir, A.; Jehangir, W.; Ashfaq, M. Unpublished 1. Impact assessment of irrigation infrastructure development on dynamics of incomes and poverty: Econometric evidence using panel data from Pakistan. Colombo, Sri Lanka: International Water Management Institute.

Hussain, I.; Hanjra, M.A.; Thrikawala, S.; Wijerathne, D. Unpublished 2. Impact assessment of irrigation infrastructure development on dynamics of incomes and poverty: Econometric evidence using panel data from Sri Lanka. Colombo, Sri Lanka: International Water Management Institute.

Hussain, I.; Marikar, F.; Jehangir, W. 2000. Productivity and performance of irrigated wheat farms across canal commands in the lower Indus basin. IWMI Research Report 44. Colombo, Sri Lanka: International Water Management Institute.

Kumar, P.; Joshi, P.K.; Johansen, C.; Asokan, M. 1998. Sustainability of rice-wheat based cropping systems in India: Socio-economic and policy issues. Economic and Political Weekly, Sept. 26: A151-158.

MANAGE (The National Institute of Agricultural Extension Management ). 2002. Indian Agripreneur Volume 1, October 2002 and Volume 2, December 2002. Hyderabad: MANAGE.

Molden, D.; Sakthivadivel, R.; Zaigham, H. 2001. Basin level use and productivity of water: Examples from South Asia. IWMI Research Report 49. Colombo, Sri Lanka: International Water Management Institute.

Mudasser, M.; I. Hussain; M. Aslam. Unpublished. Constraints to Wheat Productivity in Pakistan: A Review of Literature. Colombo, Sri Lanka: International Water Management Institute (IWMI).

NDC (National Development Council). 1996. *Agricultural policy recommendations: Report of the National Development Council Working Group on Agricultural Policy, Volume 1.* Colombo, Sri Lanka: National Development Council.

Rennie, W. F.; Greller, W.; Mackay, M. 2002. *Review of international best practice in service delivery to remote and rural areas.* Edinburgh: The institute of Rural and Island studies and The Scottish Center for Information Research, Lews Castle College, Scottish Executive Social Research.

Tyagi N.K; D.K. Sharma. Unpublished. Improving wheat productivity in Indo-Gangetic Plains: Constraints and Technological Options: A Review of Literature. Colombo, Sri Lanka: International Water Management Institute (IWMI).

Vermillion, D. L. 1991. *The turnover and self-management of irrigation institutions in developing countries*. Colombo, Sri Lanka: International Irrigation Management Institute.

Wijayaratne, C.M. Unpublished. Role of farmer companies in the Sri Lankan economy. Unpublished report. Colombo, Sri Lanka: International Irrigation Management Institute (IIMI).

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