ENHANCING CAPACITIES ON SUSTAINABLE AGRICULTURE FOR POVERTY REDUCTION

Asia-Japan Partnership Network for Poverty Reduction (AJPN)

ANGOC

United Nations Development Programme

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Foreword

SINCE MAN FIRST walked on earth, he has depended on the land for survival.

From the land, he gets the food he eats, the roof over his head and the clothes to protect him from the harsh elements.

And so it has gone until today when, despite the rapid advances in technology that have put a man on the moon and gave rise to the Internet, more than half of the world's population still depend on the land for their survival, the majority of whom hardly have enough to make ends meet.

Unfortunately, decades of abuse is making it harder for the less fortunate to survive on what they can produce out of the land.

Massive doses of synthetic fertilizers and wasteful production techniques have depleted the land of its nutrients, exposed farmers to myriad health risks and contributed to the slow but sure degradation of the environment.

But there is hope.

Because of the unabated rise in the prices of synthetic inputs that has eaten into the already meager income of farmers, they are hard pressed to look at other ways to produce their crops – ways that will allow them to produce the same volume at less cost.

This is where sustainable agriculture comes in.

Experts define sustainable agriculture as a method of growing crops that conforms to what nature itself has designed.

It depends on organic fertilizers and materials to control pests and enrich the soil, and the proper planting of different crops.

By doing so, production is increased, the farmers are no longer exposed to harmful chemicals and the land regains its strength, ensuring productivity for the next generation of farmers.

It is admittedly harder to engage in agriculture in a sustainable manner, compared to conventional methods that rely heavily on fertilizers and pesticides, because it requires more skill and demands for labor.

But consumers are rewarding farmers for their efforts as the growing awareness of the potential harm of eating food produced through conventional means has made organic and natural food very much in demand, both in the local and international markets.

And consumers are willing to pay a higher price.

Yet despite these compelling reasons to go into sustainable agriculture, many still view it with skepticism.

Can sustainable agriculture really deliver on its promise of higher production and improved income for the farmers when conventional wisdom supports the use of synthetic inputs?

The Asia Japan Partnership Network for Poverty Reduction believes that it can.

To prove it, it has embarked on a two-year project to determine whether sustainable agriculture techniques have helped improve the lives of six chosen pilot sites in India, Indonesia and the Philippines.

While AJPN admits that two years is not enough to make definite conclusions, the results are nevertheless encouraging enough to make AJPN and partner organizations and local government units persevere with their efforts to promote sustainable agriculture.

The results are given in great detail in this publication that documents the experience in the pilot sites and the efforts put in by the farmers to improve their lives and those of their families, while protecting the land that they depend on so heavily.

AJPN hopes that by the example of the intrepid farmers and partner organizations that have made great strides toward full adoption of sustainable agriculture techniques, others may learn from their example.

Future generations are depending on it.

To the benefactors of the project, especially the Government of Japan and the UNDP offices in the Philippines and in New York that have guided us in project implementation, we convey our deep appreciation for their assistance. To our project partners, their farming communities, the AJPN network, especially Mr. Michio Ito, and our short-term consultants, we sincerely acknowledge their contribution in making this project a success.

We would also like to thank Ms. Tina Arceo-Dumlao for editing the papers, Ms. Liza Almojuela for making the layout and Mr. Jupito for the cover design.

All these would not have been possible without the diligence and commitment of the project team – Ms. Faina L Diola, Ms. Mary Grace Santos and Ms. Joy Dumalanta – who continue to work for the well being of the farmers.

ROEL RAVANERA
AJPN Project Coordinator

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AJPN logo

Asia-Japan Partnership Network for Poverty Reduction (AJPN)

The AJPN is a consortium of national and regional NGO networks and civil society organizations working actively on various poverty reduction initiatives. It aims to promote and contribute to the reduction by half of the Asian people living in poverty by 2015 and to improve quality of life.

AJPN thrives on the commitment of Asian and Japanese NGOs to exchange information and collaborate in implementing field level initiatives while linking this to policy advocacy work. It promotes the use of participatory approaches in the development of site-specific interventions as perceived by the communities themselves.

AJPN focuses its interventions on three program areas, namely: basic education and human resource development, sustainable agriculture and micro finance.

ANGOC logo

Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOC)

The ANGOC is a regional organization of 21 network and regional networks of non-government organizations (NGOs) from 11 countries actively engaged in food security, agrarian reform, sustainable agriculture and rural development activities. Its member-networks have an effective reach of some 3,000 NGOs throughout the region. Its mission is to create a policy and social environment that enables Asian and rural poor communities to exercise their rights to participatory development, gain access to and control of their natural resources, and engage in sustainable livelihoods while drawing from Asia's rich spiritual and cultural traditions.

UNDP logo

United Nations Development Programme (UNDP)

UNDP is the UN's global development network, an organization advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. We are on the ground in 166 countries, working with them on their own solutions to global and national development challenges. As they develop local capacity, they draw on the people of UNDP and wide range of partners.


chapter
I

Poverty and the Millennium Development Goals

Liza, an Aeta from a village at the foot of Mt. Pinatubo in Zambales, Philippines, often went to school hungry because her parents' income as farmers was not enough to support her and her four siblings.

She also worked as a health worker in the village to have a little allowance to keep her in school. It was not nearly enough to meet her needs, so she was forced to stop school to look for another job.

Liza ended up a domestic helper in the Philippines' capital of Metro Manila, around 160 kilometers away from her hometown.

In Tondo, Manila, 19-year old Lovelyn Bacani who sells slippers at the public market, still dreams of becoming a high school teacher. So she saves a little of her income to pursue her studies.

Her mother had died of skin cancer and her father could not raise enough money from farming to fend for her and her four other siblings, forcing her to stop school after getting her high school diploma.

Liza and Lovelyn's stories are unfortunately shared by millions of others who are considered among the world's extremely poor, or those who live on less than $1 a day.

Never before in the history of man has there been so many hungry and poor people in the world, this despite the significant advances in science and technology.

Consider these disturbing facts:

- 799 million people go to bed hungry every day.
- Around 115 million of the 680 million children who are supposed to go to school are not enrolled, mostly girls, because their parents do not have enough money.
- 879 million people are not able to read and write, mostly women.
- Every day, more than 30,000 of the world's children die from preventable diseases, such as malaria and tuberculosis.
- In 2002, 3.1 million people died of AIDS and around 42 million are still suffering from it.
- 1.1 billion of the world's population, or about one in five, do not have access to safe water.

It is also a fact that two of three of the world's poor are in Asia. Most of them live in rural areas and are dependent on agriculture for a living, but lack access to land and suffer from low productivity.

Hardly anyone thinks that they will ever get out of the pits of poverty.

But such a situation of having so many poor people in a world that is also characterized by excess food production in industrialized countries can not continue if the world is to survive to the next millennium.

The heads of the world's governments realized this and decided to finally act together to alleviate poverty, the biggest scourge of the 21st century.

Millennium Development Goals

Thus, at the start of the new millennium six years ago, the world's governments unified to make a remarkable promise to the victims of global poverty.

Meeting at the United Nations, they signed the Millennium Declaration, a solemn pledge "to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty."

In short, they wanted to make poverty history.

The declaration provides a bold mission rooted in a shared commitment to universal human rights and social justice backed by clear time-bound targets.

These targets, popularly known as the Millennium Development Goals, include halving extreme poverty, cutting child deaths, providing all of the world's children with an education, rolling back infectious diseases and forging a new global partnership to deliver results.

All these targets are expected to be met by 2015.

There have been significant steps toward meeting these ambitious goals, but with just nine years left to meet the deadline, most of the targets are in danger of not being met, particularly in the area of poverty reduction, the overarching goal of the MDGs.

But there is hope.

This comes from the increasing recognition on the part of governments and decision makers of the role that a dynamic agriculture sector can play in poverty and hunger reduction.

The bulk of the poor, after all, depend on agriculture for a living. As agriculture develops, so will the farmers' standard of living. Even the United Nations has realized this basic truth.

In 2005, the UN Millennium Project Report concluded that "the global epicenter of extreme poverty is the smallholder farmer."

A report by the UN Secretary General recognized agricultural reform as "one of the major means of wealth creation and income redistribution in the newly industrialized countries of East Asia."

The Food and Agriculture Organization added that the battle to achieve the MDGs, in particular the goals on poverty and hunger reduction, would be lost or won in the rural areas of the developing countries.

Rural Development

The promotion of rural development increases employment opportunities in rural areas, reduces regional income disparities, stems premature rural-urban migration and ultimately reduces poverty at the very source, the FAO said.

Agriculture has not always been considered a priority. In fact, the opposite is true: it has been neglected and the people that depend on it left to fend for themselves.

It is partly due to this neglect by governments that rural poverty in Asia has grown over the last 10 to 20 years.

World Bank data showed that its investments in agriculture declined from around $50 billion in 1980 to just $15 billion today, or from around 30 percent of its total loan portfolio to as low as 10 percent.

Even development agencies seemed to have taken agriculture for granted.

In the 1990s, multilateral donor investments in agriculture fell by 58 percent and bilateral investments by 36 percent.

Governments and development agencies are fortunately taking a fresh look at agriculture and the opportunity that it presents to achieving the MDGs.

So too are non-government organizations and development organizations.

In 2001, more than a hundred representatives of NGOs, workers unions, universities and civil society groups met in Tokyo to discuss how to support the achievement of the MDGs.

Focusing on their experiences and expertise, they decided to focus on three program areas: basic education and human resource development; microfinance and sustainable agriculture.

AJPN

To follow up on their commitments, they formed a loose coalition called the Asia Japan Partnership Network for Poverty Reduction.

It aims to promote and contribute to the halving of the number of Asian people living in poverty by 2015 and the improvement of their quality of life.

And while other agencies have focused on merely raising agriculture production, AJPN argues for the promotion of sustainable agriculture, one that increases production while protecting the environment, ultimately raising the farmers' income.

Some policy makers have questioned the capacity of sustainable agriculture to supply the food needs of the increasing population, and consequently the increasing ranks of the poor.

The yields are low and the technology backward. It is labor intensive and the products are not attractive market, they said.

The allegations are not entirely correct and

have been proven wrong in a number of scientific studies. But what is unfortunate is that agriculture development has come to mean increasing productivity alone.

This thinking has dominated agriculture policies and programs, but as the growth in the number of poor people has proven, modern agriculture programs have not been of much help, despite all that support.

While productivity is an important goal, stability and sustainability of the farming systems are equally important.

In sustainable agriculture, diversification and integration are integral components of production technologies.

Diversification stabilizes the production system as natural processes come into play, while integration reduces production cost and maximizes the output.

The recent study conducted by Jules Pretty of the University of Essex in England, in coordination with colleagues in Thailand, China, Sri Lanka and Mexico, also belies allegations that yields of sustainable agriculture technologies are low.

The study covering 286 farm projects in 57 countries concluded that "crop yields on farms in developing countries that used sustainable agriculture rose nearly 80 percent in four years."

Sustainable Agriculture

Proponents argue that sustainable agriculture stands a better chance of providing the basic needs of rural poor communities since it is not dependent on expensive chemicals and fertilizers.

Its potential lies in its indigenous local agricultural traditions that are ecologically sound, culturally appropriate and cost-effective.

Yet, the question remains: Is sustainable agriculture an effective tool for poverty reduction?

It is this fundamental question that AJPN has tried to answer through its "Enhancing Capacities on Sustainable Agriculture for Poverty Reduction" project.

The Government of Japan provided the needed funds, which were coursed through the United Nations Development Program.

The timing could not be better as the unabated rise in the cost of chemical inputs and the increasing demand for natural and organic products in the market have forced policy makers to look more closely at adopting sustainable agriculture practices.

It is slowly being recognized that farmers, who comprise the majority of the poor people in Asia, can increase their income by adopting sustainable farming practices while taking advantage of premium prices for organic products.

Demand for natural and organic products have increased in the last five years by 15-20 percent, as consumers become more aware of the ill effects of chemically-produced food.

This demand has pushed up prices, giving farmers an incentive to consider sustainable agriculture that produces organic products.

A number of Asian governments have supported this trend toward organic food by formulating organic standards and setting up certification processes over the last three years.

NGOs and farmer organizations played key roles in fostering a more friendly policy environment for organic food and sustainable agriculture practices as they have the experience.

AJPN is one of these organizations.

With this project, AJPN aims to further contribute to the movement toward sustainable agriculture by seeing exactly how natural farming practices can work at the farmers' level.

Six project sites were selected: Bihar and Andhra Pradesh in India; Central Java and Jogjakarta in Indonesia; and Bukidnon and Sultan Kudarat in the Philippines.

The knowledge of and capabilities of the communities in these sites to implement different sustainable agriculture techniques were enhanced. Development plans were devised based on the unique set of capabilities of the farmers in these areas and the resources that they have at their disposal.

The communities were involved at the start in coming up with the development plans to enhance their sense of ownership of the project, which is vital if the projects' gains are to be sustained in the long term.

Encouraging Results

The two-year project came to an end in 2006 and this paper attempts to document the experience at these sites, from which other AJPN members can learn.

As to the question of whether sustainable agriculture is viable for poverty reduction, the initial answer is yes, it is.

This paper provides proof by looking more closely at the project sites, what the farmers there have done as they adopted sustainable agriculture techniques, the results of their efforts and finally, the lessons learned and the recommendations to those who want to follow the example of the farmers that participated in the project.

This puts particular focus on how sustainable agriculture has contributed to reducing poverty in these sites.

It looks at the economic benefits measured in terms of net income and analyzes various factors contributing to the increase or decrease of net income, particularly yield, production cost and the price of products.

While two years is not enough to make definitive conclusions, the results have been encouraging: They show the unmistakable trend of farmers and their communities doing better than they did before the field studies began in 2004, putting them firmly on their way out of the clutches of poverty.


chapter
II

India

National Agriculture Situationer

Prepared by: Association of Voluntary Agencies for Rural Development (AVARD)
Edited by: Teresa Lingan–Debuque

AGRICULTURE IS THE backbone of the Indian economy, with 65 percent of the population eking out a living either directly or indirectly from it.

In recent years, however, Indian agriculture has found itself in a state of flux and transition.

On the one hand, it is in the process of integration with the global market; on the other, it faces policy constraints and bottlenecks at the domestic front.

Issues of subsidy, mindless exploitation of water resources for commercial agriculture, use of chemicals, and conventional and non-conventional energy figure prominently.

Climate change and frequent droughts and floods have been wreaking havoc of late on the agriculture sector.

On a positive note, productivity improvements brought about by high-yielding crop varieties and a movement towards Sustainable Agriculture have been encouraging.

By and large, the organic agriculture market in the country is unorganized and is confined primarily to the metros like Delhi, Mumbai, Chennai, Kolkata, Bangalore and Hyderabad. One of the challenging issues is estimating the area under organic agriculture. Global market trends point to an enormous potential waiting to be tapped.

The National Policy on Agriculture stresses the centrality of the concept of Sustainable Agriculture.

The policy seeks to improve the natural resources of the country and resort to measures to contain biotic pressures on the land.

Proper use of water resources, especially ground water, figures highly among the government's priority tasks.

Integrated Nutrients and Pest Management (INM and IPM) and agro-forestry are expected to become prime thrusts, besides concerted efforts to pool, distill, and evaluate traditional practices, knowledge and wisdom.

Despite showing positive signs, India's organic agricultural market is not growing fast enough to persuade a larger chunk of the farming community to shift to organic farming and practices.

Some of the major stumbling blocks in this regard are poor quality bio-inputs in the market, and lack of proper infrastructure for the distribution and storage of bio-inputs, among others.

Bio-fertilizers are also perceived as less effective and as a result, the farmers are not keen to adopt the new practice.

In addition, changing the cropping pattern is a slow and time-consuming process and, given that majority of Indian farmers are illiterate, quite complicated.

On the flip side, the growing export market, the price premium for organically produced crops, increasing involvement of private companies in the field of agricultural extension and greater government attention, is opening up new vistas in sustainable agriculture.

Situationer

Agriculture has a vital role in the economic development of India as it accounts for 24.2 percent of the country's gross domestic product (GDP), employs 56.7 percent of the country's work force, and accounts for 14.7 percent of total export earnings.

After being a food deficit country for about two decades after independence, India has not only become self-sufficient in food grains but has even attained a surplus. The situation started to improve gradually after the mid 1960s with the

Table 1. **Food Grain Production (*million tons*)**

Crop/Year	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2000-2003	2003-2004
Rice	81.7	82.5	86.1	89.7	85.0	93.3	72.7	86.4
Wheat	69.4	66.4	71.3	76.4	69.7	72.8	65.1	72.7
Coarse Cereals	34.1	30.4	31.3	30.3	31.1	33.4	25.3	36.8
Pulses	14.2	13.0	14.9	13.4	11.1	13.4	11.1	14.9
Food Grains								
Kharif	103.9	101.6	102.9	105.5	102.1	112.1	87.8	110.5
Rabi	95.5	90.7	100.7	104.3	94.7	100.8	86.4	100.3
Total	**199.4**	**192.3**	**203.6**	**209.8**	**196.8**	**212.9**	**174.2**	**210.8**

Source: ***Ministry of Agriculture***

introduction of high yielding varieties of crops and the development of infrastructure for irrigation, input supply, storage and marketing.

The production of various crop commodities has increased substantially over the various plan periods. Food grain production increased to 211.32 MT (million tons) in 2001-02 from 89.36 MT in 1964-65.

Similarly, the production of commercial crops like sugarcane (9,283 million tons), oilseeds (22.4 million tons), and cotton (13.1 million bales) reached record levels in 1995-96.

Table 2. **Food Grain Production During Various Five–Year Plans *(million tons)***

Commodity	IV Plan	V Plan	VI Plan	VII Plan	VIII Plan	IX Plan
Rice	44.05	53.77	58.34	73.57	81.74	91.61
Wheat	21.78	35.51	44.07	49.85	69.35	71.47
Coarse Cereals	28.83	30.44	31.17	34.76	34.10	34.72
Pulses	10.01	12.18	11.96	12.86	14.24	13.52
Total Food Grains	**104.67**	**131.90**	**145.54**	**171.04**	**199.44**	**211.32**

Source: ***Ministry of Agriculture***

Table 3. **Commercial Crop Production *(million tons)***

Crop/Year	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2000-2003	2003-2004
Groundnut	8.6	7.4	9.0	5.3	6.4	7.0	4.4	8.5
Rapeseed/Mustard	6.7	4.7	5.7	5.8	4.2	5.1	3.9	5.9
Soyabean	5.4	6.5	7.1	7.1	5.3	6.0	4.6	7.6
Other Oil Seeds	3.7	2.7	3.0	2.5	2.5	2.6	2.2	3.0
Cotton	14.2	10.9	12.3	11.5	9.5	10.0	8.7	13.5
Jute & Mesta	11.1	11.0	9.8	10.6	10.6	11.7	11.4	11.2
Sugarcane	277.6	279.5	288.7	299.3	296.0	297.2	281.6	244.8

Source: ***Ministry of Agriculture***

Table 4. **Growth Rates of GDP and Agriculture Production *(percent)***

Year	GDP	GDP in Agriculture and Allied Sector	Physical Production of Agriculture
1992–93	5.1	5.8	4.2
1993–94	5.9	4.1	3.8
1994–95	7.3	5.0	5.0
1995–96	7.3	-0.9	-2.7
1996–97	7.8	9.6	9.3
1997–98	4.8	-2.4	-5.9
1998–99	6.5	6.2	7.6
1999–00	6.1	0.3	-0.6
2000–01	4.4	-0.1	-6.3
2001–02	5.8	6.5	7.6
2002–03	4.0	-5.2	-15.6
2003–04	8.1	9.1	19.3

Source: ***Ministry of Agriculture***

Table 5. **Area and Production of Major Horticultural Crops**
(Area: **million hectares,** Production: **million tons)**

Crops	1999–2000		2000–2001		2001–2002		2002–2003	
	Area	Production	Area	Production	Area	Production	Area	Production
Fruits	**3.80**	**45.50**	**3.89**	**43.14**	**4.00**	**43.00**	**4.18**	**47.68**
Apple	0.23	1.05	0.24	1.23	0.24	1.16	0.25	1.47
Banana	0.49	16.81	0.47	14.14	0.47	14.21	0.68	16.82
Citrus	0.53	4.65	0.50	4.40	0.62	4.80	0.60	4.72
Grapes	0.04	1.13	0.05	1.06	0.05	1.21	0.06	1.15
Guava	0.15	1.71	0.15	1.63	0.15	1.72	0.22	1.78
Litchi	0.05	0.43	0.05	0.40	0.06	0.40	0.05	0.44

Table 5. ***/continued***

Crops	1999–2000		2000–2001		2001–2002		2002–2003	
	Area	Production	Area	Production	Area	Production	Area	Production
Mango	1.49	10.50	1.52	10.06	1.58	10.02	1.60	10.78
Papaya	0.06	1.67	0.07	1.79	0.07	2.59	0.08	1.85
Pineapple	0.07	1.02	0.08	1.22	0.08	1.18	0.09	1.31
Sapota	0.06	0.64	0.07	0.74	0.05	0.60	0.07	0.71
Others	63.00	5.89	0.23	6.49	0.63	5.11	0.48	6.65
Vegetable	**5.59**	**90.83**	**6.25**	**94.00**	**6.20**	**88.62**	**7.59**	**97.50**
Brinjal	0.50	8.12	0.47	7.70	0.50	8.35	0.50	7.83
Cabbage	0.26	5.91	0.25	5.51	0.26	5.68	0.28	5.80
Cauliflower	0.25	4.72	0.26	4.69	0.27	4.89	0.28	4.80
Okra	0.35	3.42	0.35	3.34	0.35	3.32	0.37	3.53
Onion	0.49	4.90	0.45	4.72	0.50	5.25	0.53	5.45
Pea	0.27	2.71	0.32	3.01	0.30	2.04	0.35	3.20
Potato	1.34	25.00	1.21	22.44	1.25	24.45	1.37	25.00
Tomato	0.46	7.43	0.46	7.24	0.46	7.46	0.54	7.60
Others	**2.07**	**28.63**	**2.48**	**35.35**	**2.31**	**27.18**	**3.37**	**34.74**
Flowers	0.09	0.52	0.10	0.56	0.11	0.54	0.15	0.70
Spices	2.50	3.02	2.50	3.02	3.22	3.77	–	–
Cashew Nut	0.69	0.52	0.72	0.45	0.74	0.46	0.73	0.47
Areca Nut	0.69	0.52	0.72	0.45	0.74	0.46	0.73	0.47
Coconut	1.77	12.23	1.82	12.68	1.89	12.82	–	–
Other Horticultural Crops	**NA**	**1.75**	**0.11**	**0.15**	**0.12**	**0.17**	**0.13**	**0.19**

Source: ***Ministry of Agriculture***

Table 6. **India's Position in the International Ranking in Production of Various Fruits and Vegetables *(1999)***

Crop	Rank	Crop	Rank
Apple	10	Brinjal	2
Banana	1	Cabbage	2
Mango	1	Cauliflower	1
Papaya	2	Peas	1
Pineapple	4	Onion	2
Grapes	10	Potato	3
Coconut	3	Cashew	1
Total Fruits	**2**	**Total Vegetables**	**2**

Source: ***Indian Horticulture Database, 2001***

India also accounts for 10 percent of global fruit production, second only to Brazil, and is the second largest producer of vegetables after China, contributing 13.4 percent of the world's vegetable production. In fact, the high level of land productivity in many parts of the country can be largely attributed to the growing of high value horticulture crops.

This is due to the support given to the horticulture sector during the Eighth and Ninth plan.

At the same time, output growth in agriculture has leveled off at 2.5 to 3 percent a year since the 1950s. Capital formation in the agriculture sector grew by 6.05 percent between 1989-90 and 1994-95, but its share of total gross capital formation actually declined to 10.85 percent from 18.86 percent in 1980-81 (using 1980-81 prices).

There are region-specific causes for decelerating growth in the agriculture sector during the 1990s. Some of the most notable are:

- Low public investment in irrigation and poor maintenance of existing irrigation facilities.
- Poor maintenance of rural infrastructure, specially canals and roads.
- Decline in investments in rural electrification and in its availability. This has greatly affected the population in eastern India, where huge groundwater potential remains untapped.
- Rising level of subsidies for power, water, fertilizers and food are eating into the public sector investment in agriculture, besides encouraging inefficient use of scarce resources such as water. This further aggravates environmental problems, leading to loss in soil fertility and decline in ground water, which further reduces returns on capital. Farmers then demand further subsidies to maintain the same level of production.

- ❖ Inadequate credit support.
- ❖ Continuing imbalanced use of N, P and K fertilizers (6.69:2.59:1.0 in 2001-02 as against the desirable norm of 4:2:1) and increasing deficiency of micro-nutrients in soil.
- ❖ Stringent controls on movement, marketing, credit, stock and export of agri- products that affect their profitability. In the face of pressure from the WTO, there is an apprehension that without speedy domestic market reforms, attempts to access world markets would actually threaten the future growth of Indian agriculture. The classic case is that of sugar where imports were opened at zero duty when controls on domestic markets remained widespread.
- ❖ Growth in Total Factor Productivity (TFP)[1] appears to be decelerating, suggesting a decline in the use of technology.
- ❖ Demand constraints (slow growth of the urban economy, restrictions on exports, lack of land reforms, failure of poverty alleviation schemes, slow growth in rural wages).
- ❖ Controls on the agro processing industry.
- ❖ Poor extension service.

Several changes have taken place in the agriculture sector in recent years. For instance, the contribution to output growth of area expansion and yield increases has changed significantly in the last 50 years. Between 1950-51 and 1970-71, or before the Green Revolution made such headway, total cropland grew by 30 percent and the index of yield per unit area, by 43 percent.

However, between 1970-71 and 1996-97, the total area planted to crops shrank to just 11 percent while yield growth shot up to 61 percent, reflecting primarily the effects of the Green Revolution.

Secondly, the contribution of the different regions and crops to aggregate growth has also changed.

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[1] Total Factor Productivity (TFP), which is a comprehensive measure of technical progress, has been discouraging. According to the World Bank (WB), India's TFP registered negative growth (-0.59 percent a year) in the first half of the 1990s compared to a healthy 1.39 per cent annual average in the 1980s. The states of Assam, Gujarat, Haryana, Madhya Pradesh, and Rajasthan recorded larger declines in TFP in the first half of the 1990s compared to the 1980s. Maharashtra and Tamil Nadu both registered a decline, while Andhra Pradesh and West Bengal saw positive though slower growth in the latter period. In contrast, the states of Bihar, Karnataka, and Kerala experienced an acceleration in TFP growth. Evidently, productivity growth is the source of increases in factor returns, including returns to labor. It is no surprise then that the slowdown in productivity growth has had an impact on the average rate of growth of real wages in rural areas, which declined from a healthy 3.56 per cent per annum in the 1990s to 0.77 per cent in 1990-93, during which India experienced an agricultural cum macroeconomic crisis (1991-92). Thereafter, though, except in 1994-95, TFP has steadily increased every year.

For example, the eastern states of Assam, Bihar, Orissa and West Bengal performed dramatically better in the 1980s and 1990s than they did in the previous three decades.

Oilseed production doubled in the last decade, while the contribution of *kharif* crops (mainly rice) has declined over the years in relation to annual output.

In 1996-97, the output of *kharif* cereals was 99 million tons compared to the *rabi* output of 86 million tons. Near self-sufficiency has been achieved, though at low levels of consumption, with respect to foodgrains and oilseeds.

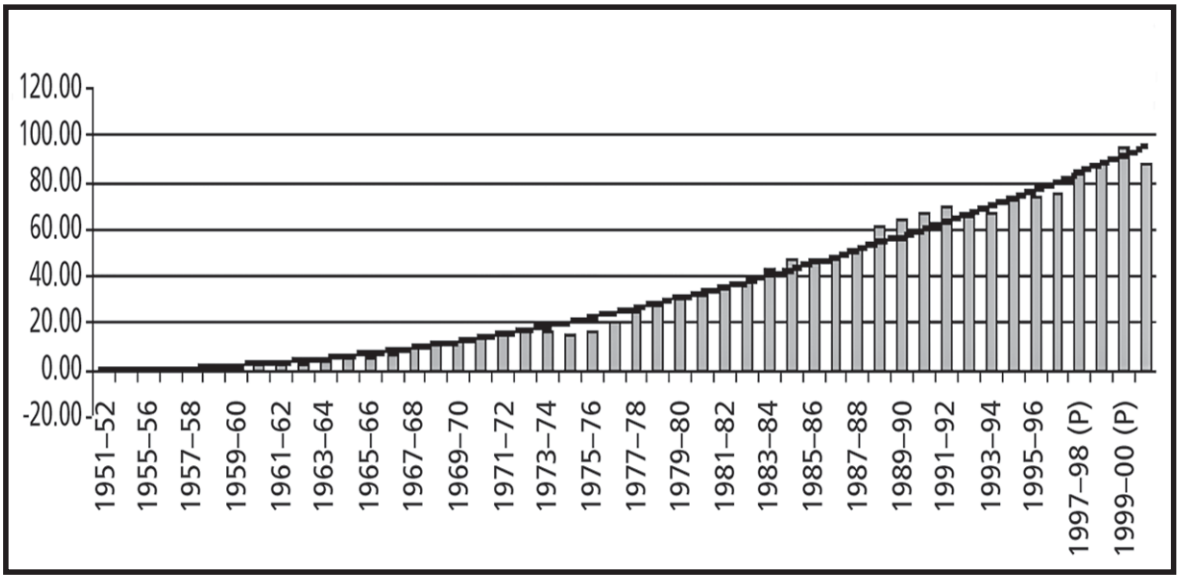
Many of these changes were the result of policies adopted at the time.

Agricultural Inputs: Trends and Challenges

Fertilizers

In the last 50 years, following independence, the use of fertilizers in India has grown nearly 170 times— from 0.55 kg a hectare in 1950 to 90.12 by 2001-02. Fertilizers and pesticides have become a major cost of production in India along with spending on other inputs like seeds and labor (http://www.etagriculture.com/).

Figure 1. **Consumption of Total Plant Nutrient per Hectare of Gross Cropped Area *(1951–1952 to 2000–2001)***

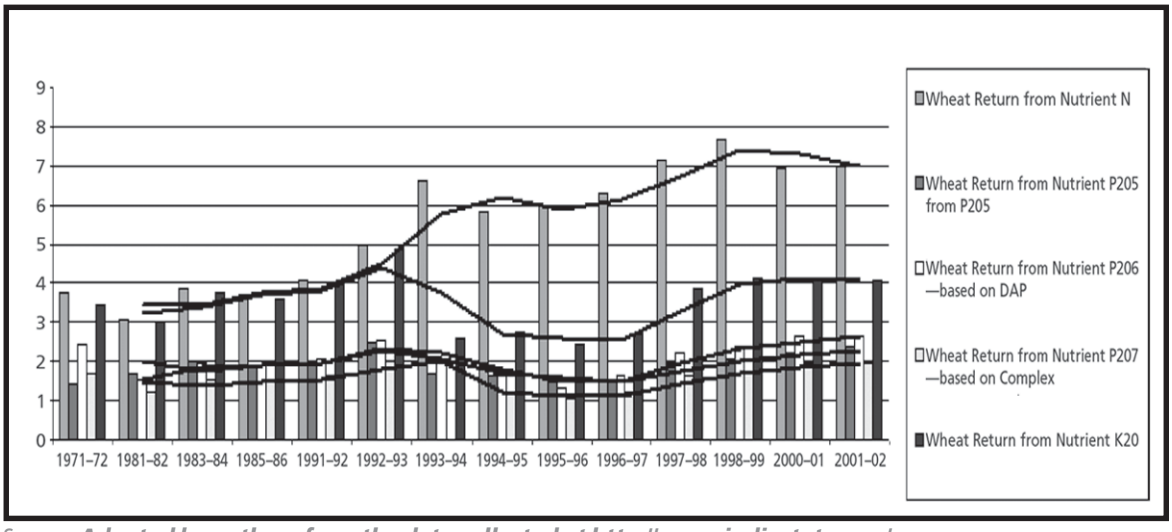


Source: ***Adapted by authors from the data at http://www.indiastat.com/***

Given the differences in the intensity of agriculture and cropping patterns across the country, there are wide variations in fertilizer consumption in India.

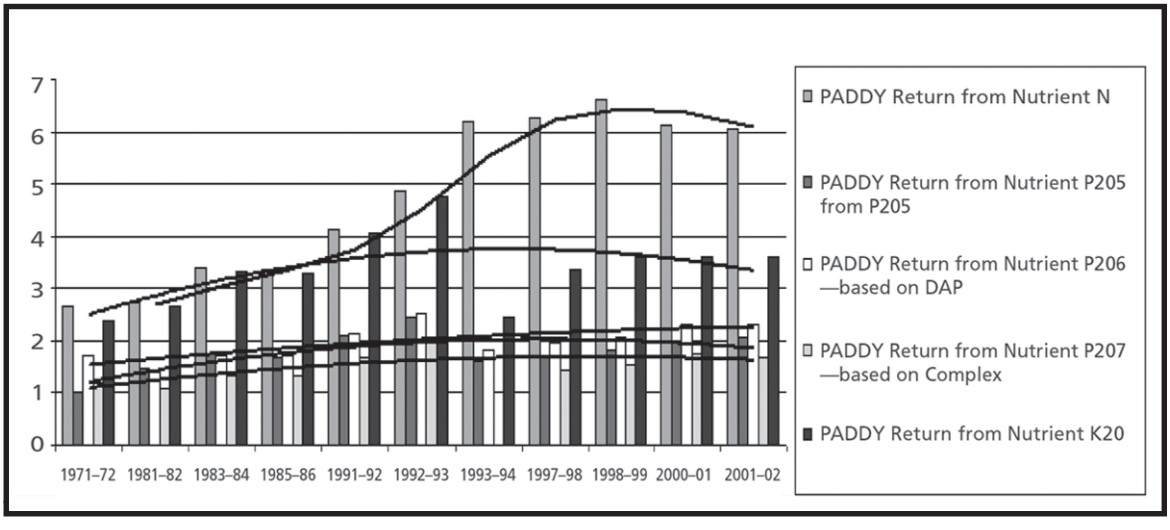
For instance, states like Punjab, Andhra Pradesh, Haryana, Karnataka, Tamilnadu, West Bengal and Uttar Pradesh have very high fertilizer consumption a hectare compared to Rajasthan, Madhya Pradesh, Himachal Pradesh, Orissa, Goa and the Northeastern states. Per hectare fertilizer use in Andhra Pradesh was as high as 179.2 kg in 2000-01, while in many Eastern states, it was less than 10 kg a hectare. Unfortunately, this increase

Figure 2. **Trends in Economics of Fertilizer Input on Wheat Production in India *(1971–2002)***



Source: ***Adapted by authors from the data collected at http://www.indiastats.com/***

Figure 3. **Trends in Economics of Fertilizer Input on Rice Production in India *(1971–2002)***



Source: ***Adapted by authors from the data collected at http://www.indiastats.com/***

in chemical usage has not always translated to increased incomes for farmers *(See Figs. 2 and 3)*.

The marginal income from land from each additional unit of chemical fertilizer and pesticide used is decreasing. This is due to the soil's low fertility (in regard to the N [nitrogen], P [phosphorous] and K [potassium] components). The deficiency of carbon in the soil has also become widespread, especially in the green revolution areas. This scenario makes the use of organic inputs more imperative.

Pesticides

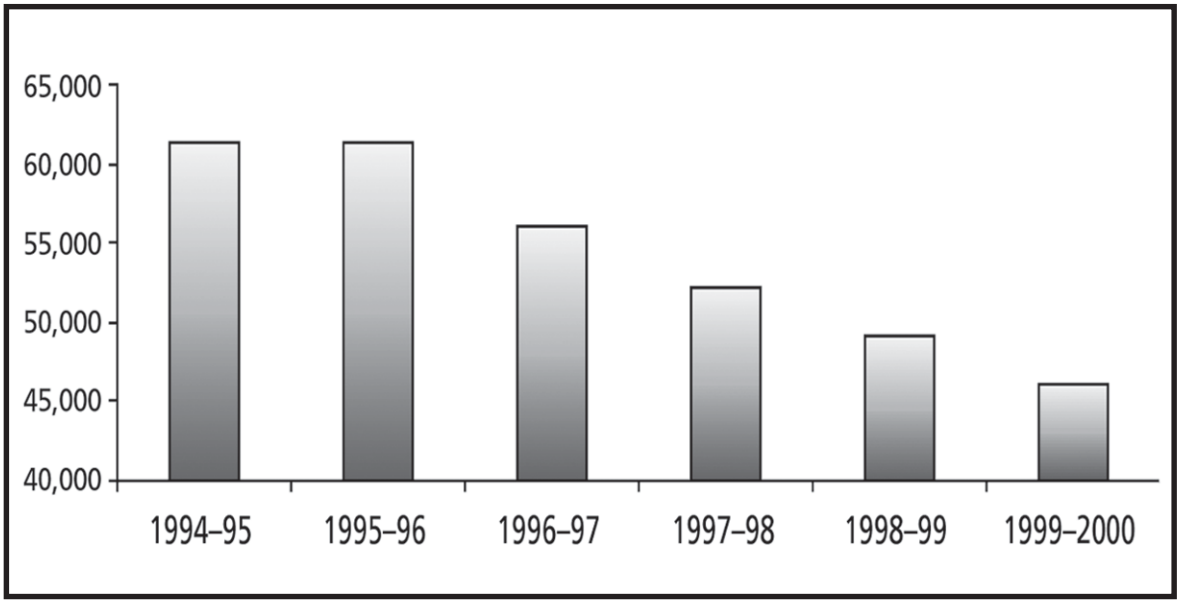
Consumption of insecticides has increased by more than 100 percent from 1971 to 1994-95, or from 22,013 tons to 51,755 tons *(http://www.indiastat.com/)*. Consumption of all kinds of pesticides more than doubled in the same period, from 24,305 tons to 61,357 tons.

Recently, however, there have been some changes in the pattern of pesticide consumption. As a result of adopting bio-intensive Integrated Pest Management (IPM) for various crops, the consumption of chemical pesticides has gone down by 27.69 percent: from 66.36 thousand metric tons in 1994-95 to 43.59 thousand metric tons in 2001-02 *(Thirty-Seventh Report of the Standing Committee on Petroleum and Chemicals, 2002)*.

The pattern of pesticide consumption in India is also very different from that in the rest of the world. In India, insecticides account for 76 percent of the total domestic market while in other countries, herbicides and fungicides have the bigger share of the market. There are likewise regional variations in pesticide consumption within India.

One of the effects of the indiscriminate use of pesticide is the adverse health impact on society in general and on vulnerable sectors like children in particular. Some of the most well-known health-related effects of pesticide exposure in-

Figure 4. **Consumption of Pesticides in India in Tons *(1994–2000)***



Source: ***Indian Chemical Statistics***

clude acute poisoning, cancer, neurological effects and reproductive and developmental harm *(CSE, 1997).*

Irrigation

Agriculture, or more accurately irrigated agriculture, is now considered the largest consumer of water, accounting for as much as 80 percent of total water use in India.

In 1951, irrigation facilities had the potential to service 22.6 million hectares and to produce 50 million tons of food.

Today, due to a four-fold increase in irrigation potential (over 10 million hectares), food production has quadrupled to about 200 million tons. The Ministry of Water Resources estimated the country's ultimate irrigation potential at 139.89 million hectares, with 58.46 million hectares being serviced by major and medium irrigation and 81.43 million hectares by minor irrigation.

The attainment of this ultimate irrigation potential through the construction of major, medium and minor irrigation projects by 2025 is essential to meeting the food requirements of the projected population increase.

With few exceptions, however, all the surface irrigation—conducted through large storage systems—has been used up. The improvement of groundwater resources and streamlining of the prevailing irrigation system are therefore imperative.

After all, the return on investment on operations improvements and modernization of existing systems is still much higher than the return on investments on new projects.

More than 5,000 million tons of topsoil are lost to erosion every year in India. A close look at the present health of the country's soil and water resources reveals their misuse and degraded state.

Indian Agriculture at a Crossroads

Almost 173.64 million hectares, or close to half of the country, are threatened by various types of degradation, such as salinity, alkalinity, waterlogging, desertification, etc.

India's forests and grasslands have also been overexploited. The frequent floods and droughts in different parts of the country is evidence of improper land use in the catchments and inadequate conservation of rainwater.

The problem of land degradation has brought India face-to-face with the rapid depletion of the land's productivity, on the one hand, and the ever-growing demand for food, fodder, fiber, fuel, land-based industrial raw materials, and many non-farm land uses, on the other.

In the meantime, India's population is more than likely to outstrip agricultural production. In 1951, India's population stood at 361 million; in 2000, this figure nearly trebled, to 1004.5 million. Although there are indications of a decline in India's population growth, from 2.14 to 1.70 percent, the country is still likely to add another

420.5 million people by the year 2020, or about 21 million people every year.

The total food grain demand by 2020 is estimated at 294 MT (122 MT rice, 103 MT wheat, 41 MT coarse grains and 28 MT pulses). Thus, by 2020, India will have to produce about 100 MT of additional food grain a year from the same or even less area (some more area will go to meet the increasing needs for roads, rails, buildings, etc.).

Some sectors have suggested that the situation leaves India with little choice but to increase its use of fertilizers. Others argue, however, that biodiversity intensification rather than chemical intensification is the way forward.

Organic Agriculture in India

Market Trends and Potentials of Organic Products in India

Given the unorganized nature of the domestic organic agriculture market in India, it is difficult to estimate the magnitude and trends in this growing market.

In general, the sale of organic produce has been limited to metros like Mumbai, Delhi, Kolkata, Chennai, Bangalore and Hyderabad. To a large extent, this sale is based on the individual initiative of farmers, Non Governmental Organizations and some entrepreneurial traders.

The current demand for domestic green products is mainly for fruits, vegetables, rice and wheat. Other products include tea, coffee and pulses *(ORG-MARG Survey, 2002).*

The market prospects for other commodities like organic spices, fruits, herbal plants and cotton are relatively high. In the next five years, it is projected that demand for organic spices will grow by 14 percent, fruits by eight percent, and herbal plants and cotton by seven percent *(ORG-MARG Survey, 2002).* The market for a range of organic agricultural products as shown in Table 7 is estimated to reach 1,568 tons in 2006-07.

Table 7. **Growth Forecast for Specific Organic Products in the Domestic Market**

Product	% Projected Growth in the Next 5 Years	Product	% Projected Growth in the Next 5 Years
Spices *(all)*	14	Pineapple	5
Pepper	5	Herbal Extracts	7
Turmeric	4.5	Cotton	7
Tea	13	Coffee	5
Rice	10	Oil Seeds	5
Fruits *(all)*	8	Honey	5
Banana	15	Groundnut	5
Mango	5	Baby Food	5
Orange	5	Coconut	5

Source: ***ORG-MARG Survey, 2002***

Area under Organic Farming

There is no official estimate of the area under organic agriculture in India as there is no central agency that collects and compiles this information. However, other agencies have come up with indicative figures.

The study undertaken by FIBL and ORG-MARG *(Garibay S V and Jyoti K, 2003)* puts the area under organic agriculture at 2,775 hectares (0.0015 percent of gross cultivated area in India). The SOEL-Survey estimated the area under organic cropping at 41,000 hectares. The same survey puts the total number of organic farms in the country at 5,661, while the FIBL and ORG-MARG survey puts it at 1,426.

Some of the major organically produced agricultural crops in India include plantation crops, spices, pulses, fruits, vegetables and oil seeds. *(See Table 8).*

Export Potential of Organic Products in India

India is best known as an exporter of organic tea and also has great export potential for many other products, such as spices and fruits.

The current production of organic crops in India is around 14,000 tons *(Garibay S V and Jyoti K, 2003).* Of this, tea and rice contribute around 24 percent each, while fruits and vegetables combined make up 17 percent.

India exports 11,925 tons of organic products, or 85 percent of its total organic crop production.

Table 8. **Major Products Produced in India by Organic Farming**

Type of Product	Products
Commodity	Tea, Coffee, Rice, Wheat
Spices	Cardamom, Black Pepper, White Pepper, Ginger, Turmeric, Vanilla, Tamarind, Clove, Cinnamon, Nutmeg, Mace, Chili
Pulses	Red Gram, Black Gram
Fruits	Mango, Banana, Pineapple, Passion Fruit, Sugarcane, Orange, Cashew Nut, Walnut
Vegetables	Okra, Brinjal, Garlic, Onion, Tomato, Potato
Oil Seeds	Mustard, Sesame, Castor, Sunflower
Others	Cotton, Herbal Extracts

Source: ***Garibay S V and Jyoti K, 2003***

The major export markets for Indian producers are Australia, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, Singapore, South Africa, Saudi Arabia, UAE, UK, and USA.

The volume of Indian exports in 2002 is shown in Table 5. Around 3,000 tons of tea were exported in that year, the highest in terms of volume, followed by rice (2,500 tons), fruits and vegetables (1,800 tons), cotton (1,200 tons), and wheat (1,150 tons) *(Garibay S V and Jyoti K, 2003).*

The burgeoning US and European "green" markets provide enormous scope for Indian exporters.

The International Trade Centre (ITC) reported strong growth in retail sales of organic products in 16 European countries, USA and Japan: from US $ 10 billion in 1997 to US$ 17.5 billion in 2000 and about US$ 21 billion in 2001.

Even if the demand in Japan for "green products" that have not been certified as organic is excluded from the total estimates, worldwide demand would still be significant: US$ 16 billion for 2000 and US$ 19 billion in 2001.

The current market share of organic products in India has been estimated at a mere 1 to 2 percent of the total food products market, but this is expected to grow in the medium-term to five percent *(Minou Yussefi and Heldge Willer, 2003).*

The premium price for various organic products varies from country to country depending on the distribution channels and market conditions.

Generally, however, this premium ranges from 30 to 50 percent (trader level) for different products.

There are immense opportunities for India's organic agricultural exports.

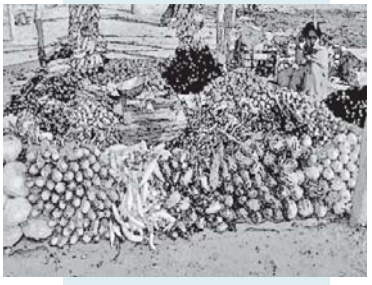


Table 9. **Major Organic Products Exported from India**

Product	Sales *(tons)*
Tea	3,000
Coffee	550
Spices	700
Rice	2,500
Wheat	1,150
Pulses	300
Oil Seeds	100
Fruits & Vegetables	1,800
Cashew Nut	375
Cotton	1,200
Herbal Products	250
Total	**11,925**

Source: ***Org-Marg, 2002***

Some of the prerequisites for exploiting this potential include:

- ❖ Farmers' capacity to produce agricultural products that have global market potential; and
- ❖ Prior experience of exporters and traders in exporting agricultural commodities to these markets.

Fig. 5 provides a matrix of conventional agricultural commodities, which India has been exporting to various countries, and the existence of an organic market for these commodities in those countries. This matrix indicates the capacity of India to export specific agricultural commodities to different countries, as well as opportunities for India's organic agricultural exports.

In developing this matrix, annual exports of agricultural commodities as published in CMIE agricultural sector reports and internet resources for exploring organic market in different countries for different commodities were used.

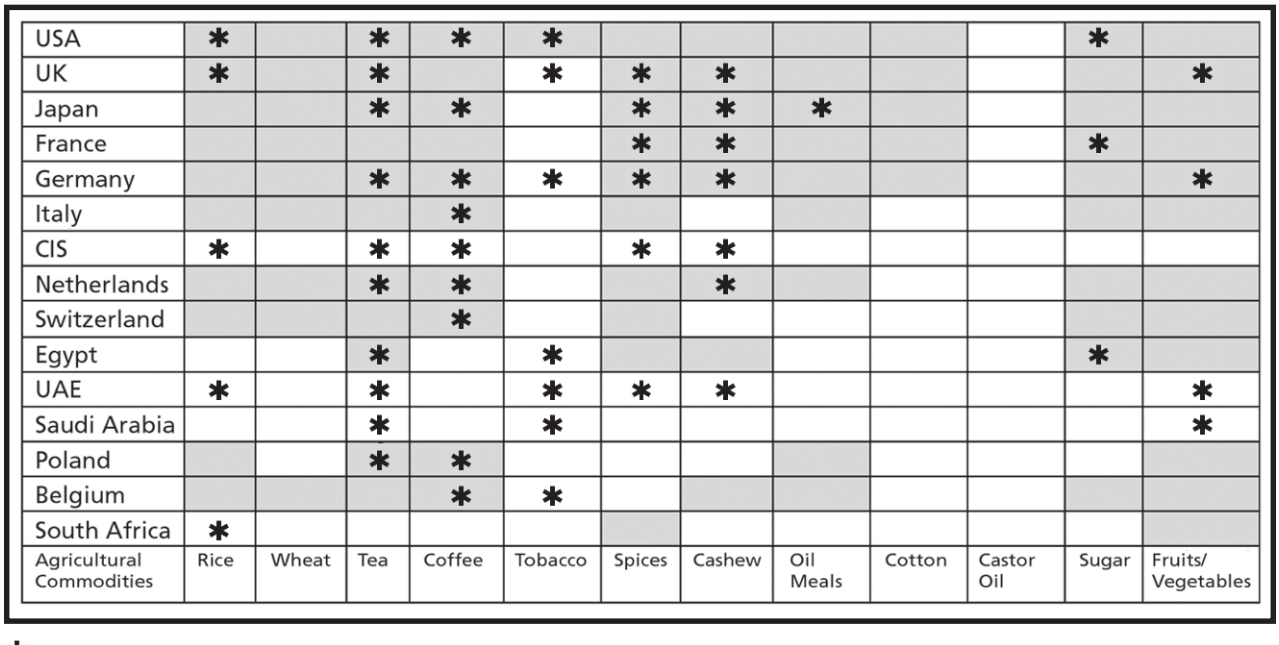
The matrix shows that India has demonstrated capabilities of exporting agricultural commodities like rice, wheat, tea, coffee, spices, oil meals, sugar, fruits and vegetables, etc. to countries like the U.S.,

Table 10. **Percentage of Organic Food and Medium-Term Growth Expected in Selected Markets**

Overview for World Market for Organic Food & Beverages in 2000 *(estimates)*		
Markets	**% of Total Food Sales**	**% Expected Growth *(medium term)***
Germany	1.6–1.8	10–15
U.K.	1.0–2.5	15–20
Italy	0.9–1.1	10–20
France	0.8–1.0	10–15
Switzerland	2.0–2.5	10–15
Denmark	2.5–3.0	10–15
Austria	1.8–2.0	10–15
Netherlands	0.9–1.2	10–20
Sweden	1.0–1.2	15–20
Belgium	0.9–1.1	10–15
U.S.A.	1.5–2.0	20

Source: ***ITC, January 2002***

Figure 5. **Conventional Agricultural Products and their Export Market and Prospective Market for Indian Organic Products**



* *Existing conventional export market for Indian producers for particular product*

Prospective market for Indian organic products

U. K, Germany, Japan, France, Saudi Arabia, South Africa, CIS Countries, Poland, Netherlands, Italy, etc.

It also shows that in most of these countries there is a demand for organically produced commodities, which attract price premiums ranging from 10 to as much as 100 percent. This is a window of opportunity that should be exploited fully by Indian exporters and producers of agricultural commodities.

India's Green Input Market

It is very difficult to estimate the size of the green inputs market in India because of its diversity in terms of products and its unorganized state.

Green inputs into agriculture include bio-fertilizers, bio-pesticides, compost, Farm Yard Manure (FYM), green manure, etc. As most of these inputs are either not traded, or if they were, only informally, available information regarding production capacity, demand and sales is at best a sketchy estimation and hence inadequate.

The green inputs market is currently controlled by the small and local producers of bio-fertilizer, vermi compost and other inputs; only a few well-established firms have a presence here.

It is easier to come up with estimates of the bio-fertilizer market in India because it is more organized than the the green inputs market and because of the presence of some large producers.

Based on the gross cropped area in India (190 million hectares) and recommended doses of bio-fertilizers, potential demand is estimated at 627,000 MT. This demand can be disaggregated according to the different categories of bio-fertilizer, such as Rhizobium, Azotobactors, Azospirillium, BGA, and Phosphate solubilizer, etc., the demand for which differs widely, as shown in Table 11.

Current production and distribution of bio-fertilizers are below target (as seen

Table 11. **Estimated Total Potential Demand for Bio-fertilizers in India**

Category of Bio- fertilizer	Amount in Million Tons
Rhizobium	35,730 MT
Azotobacter	162,610 MT
Azospirillum	77,160 MT
BGA	267,510 MT
Phosphate Solubilizer	275,510 MT
Total	**818,730 MT**

Source: ***Abhay Phadke, 2001***

Table 12. **Installed Production Capacity, Total Production and Distribution of Bio-fertilizers in India *(1992–99)***

Year	Installed Production Capacity *(tons)*	% Growth Rate in Installed Capacity	Total Production *(tons)*	% Growth Rate in Production	Total Consumption/ Distribution *(tons)*	% Growth Rate in Consumption Distribution
1992–93	5,400.5		2,005.0		1,600.01	
1993–94	6,125.5	13.42	3,084.0	53.82	2,914.37	82.15
1994–95	8,114.5	32.47	5,800.5	88.08	4,988.90	71.18
1995–96	10,680.4	31.62	6,692.3	15.37	6,288.32	26.05
1996–97	12,647.0	18.41	7,406.6	10.67	6,681.44	6.25
1997–98	NA	0.00	7,104.6	-4.08	6,295.63	-5.77
1998–99	16,446.0	30.04	8010.1	12.75	6,700.27	6.43

Source: ***The Fertilizer Association of India Bio-fertilizer Statistics, 1999–2000***

in Table 12). For example, in 2000, the proposed production target for bio-fertilizer was 39,165 MT, or just 4.8 percent of total estimated demand for that year *(Abhay Phadke, 2001).* There is obviously a huge gap between potential market demand and production.

Nevertheless, bio-fertilizer production in India is showing a positive trend. From 2,005.0 tons in 1992-93, production rose to 8,010.1 tons in 1998-99. Consumption and distribution of bio-fertilizers has also increased from 1,600.01 tons to 6,700.27 tons during the same period.

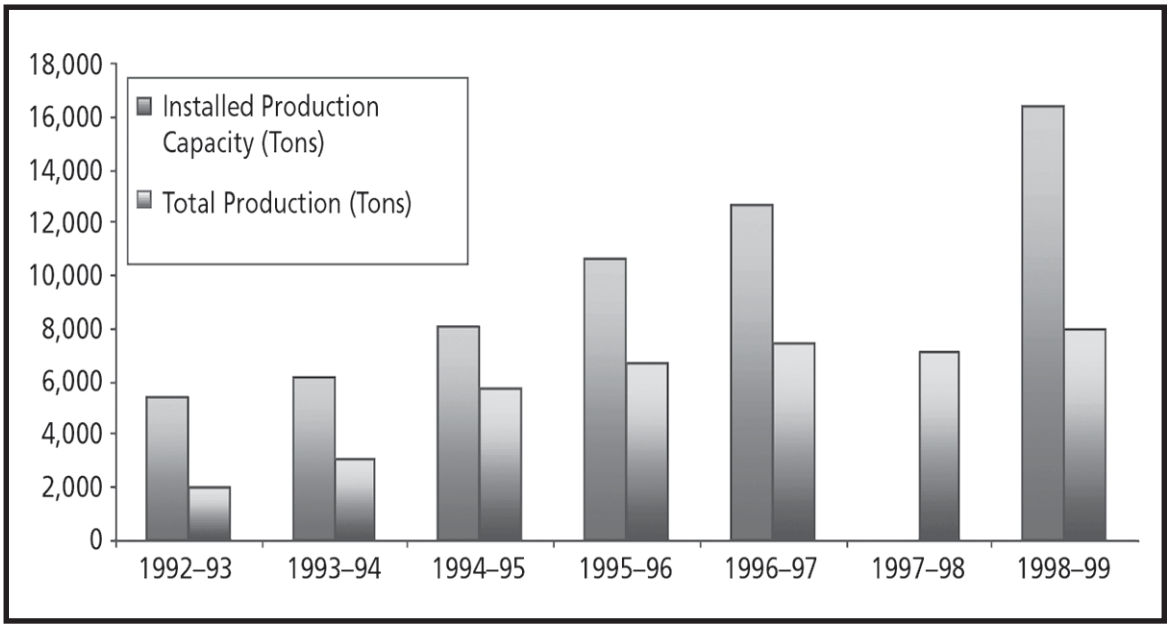
The growth rate of installed bio-fertilizer capacity is comparatively more stable than growth rates of production, consumption and distribution *(Table 12).*

For instance, the growth rate of bio-fertilizer production declined from 53.82 percent in 1993-94 to 12.75 percent in 1998-99; similarly, consumption and distribution went down to 6.43 percent from 82.15 percent in the same period. This shows that there is not only a need but also a role for the development of the green inputs market in India.

In spite of impressive growth of more than 200 percent in production capacity and 300 percent growth in production and consumption of bio-fertilizers in a six-year period (i.e., from 1992-93 to 1998-99), only around 1.5 percent of the estimated demand for bio-fertilizers is expected to be met.

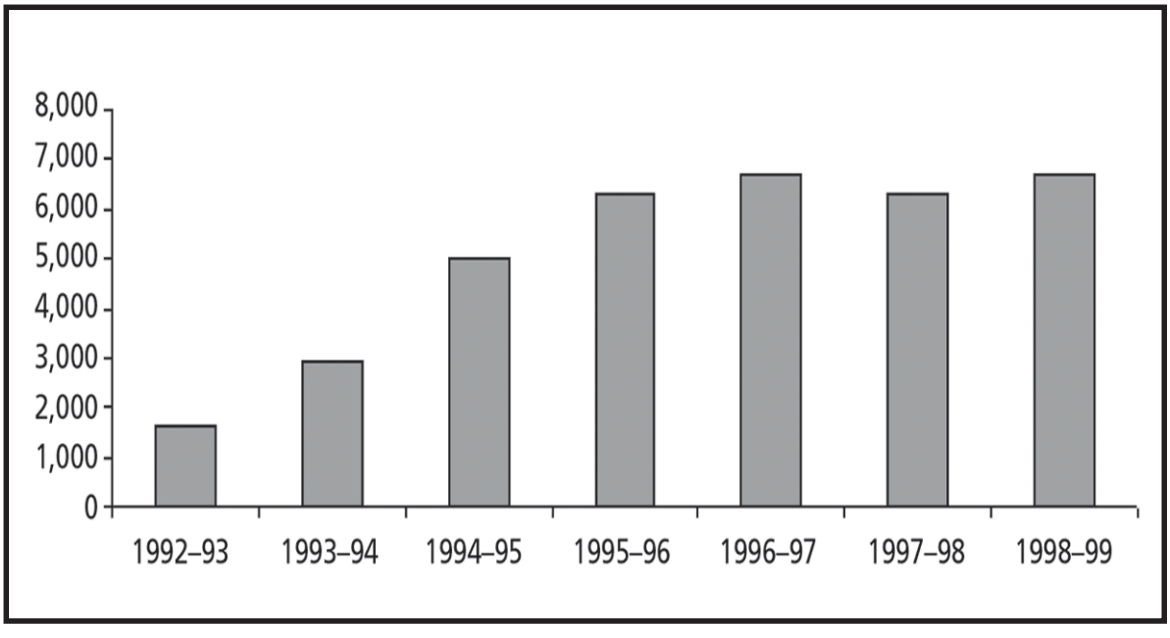
There has been an Increase in the use of vermi-compost in kitchen gardens and even for cultivation of high value cash crops, but information on actual quantities is not available.

Figure 6. **Installed Production Capacity and Total Production of Bio-fertilizers in India *(1992–99)***



Source: ***Adapted by authors from FAI, 2001***

Figure 7. **Total Consumption/ Distribution of Bio-fertilizers in India *(1992–99)***



Source: ***Adapted by authors from FAI, 2001***

Table 13. **Area under Green Manure in India *(1995–97)***

Year	Area in Lakh Hectares
1994–95	35,872
1995–96	34,411
1996–97	22,512

Source: ***FAI, 1999–2000***

The area under green manure is declining in tandem with increasing intensive cropping. Increase in irrigation facilities is also, though indirectly, contributing to the reduction of the area under green manure as seen in Table 13.

Other green inputs for agriculture in India are used in very minimal quantities. Some of the popular bio-pesticides include neem-based formulas and *Bacillus thuringingiensis* (Bt). Consumption of bio-pesticides in India increased from 83 MT (Tech. Grade) in 1994-95 to 686 MT in 1999-2000; in particular, the use of neem-based formulas increased from 40 MT to 71 MT during the same period. *(Thirty-seventh Report Standing Committee on Petroleum & Chemicals, 2002).*

National Policy on Agriculture

The last 55 years of agricultural development in the country can be divided into various phases:

- When the expansion of net sown area (NSA), irrigated area, development of rural infrastructure and land reforms played an important role;
- When the high yielding dwarf varieties, agricultural inputs like fertilizers, pesticides and improved crop production technologies ushered in the green revolution;
- When minimum support prices (MSP) and procurement of agricultural commodities were ensured and the food grain storage and distribution system was expanded at the national level; and
- When the thrust was on liberalization and globalization with the establishment of the World Trade Organization (WTO).

The main factors for the success of agriculture have been: increase in net sown area; expansion of irrigation facilities; land reforms, especially the consolidation of holdings; development and introduction of high yielding seeds, fertilizers, improved implements and farm machines, technology for pest management; a price policy based on Minimum Support Prices (MSPs) and procurement operations; infrastructure for storage; improvements in trade systems; increase in investments, etc.

Agricultural Development Strategy

The Agricultural Development Strategy was revised in 1999 as the national strategy on sustainable agriculture and rural development (SARD). The Strategy is essentially based on the goals of food security and alleviation of hunger.

A regionally differentiated strategy, based on agro-climatic regional planning which takes into account agronomic, climatic and environmental conditions, will be adopted to realize the growth potential of every region in the country.

The thrust of the Strategy is an ecological, sustainable use of basic resources such as land, water, and vegetation that serves the objectives of accelerated growth, employment and alleviation of hunger.

In the accelerated growth scenario for the Ninth Five Year Plan (1997-2002), an agricultural growth rate of 4.5 percent a year was expected. Allied sectors such as horticulture, including fruits and vegetables, fisheries, livestock, and dairy continued to register greater growth during the Ninth Plan period.

In the Ninth Plan, targets were to be achieved through a regionally differentiated strategy based on agronomic, climatic, and environment-friendly conditions.

At the macro level, the agriculture development strategy was differentiated by broad regional characteristics of an agro-economic character.

The Northwestern high productivity regions promoted diversification and high value crops, and strengthened linkages with agro-processing industries and exports.

The Eastern region, with abundant water, exploited this productivity potential through flood control, drainage management, improvement of irrigation facilities, and improved input delivery systems.

The water scarce peninsular region, including Rajasthan, focused on efficient water harvesting and conservation methods and technologies based on a watershed approach and appropriate farming systems. Ecologically fragile regions, including Himalayan and desert areas, concentrated on eco-friendly agriculture.

Animal husbandry and dairying received greater attention for development during the Ninth Five Year Plan as this sector plays an important role in generating employment opportunities for small marginal farmers and landless laborers, especially in rainfed and drought-prone areas.

The growth value of the output from the livestock sector was estimated at 26 percent of the total value from the agricultural sector.

Access to land was a key element of the anti-poverty strategy in rural areas. The program of action for land reform in the Ninth Five Year Plan included the following: detection as well as redistribution of ceiling surplus land; upgrading of land records on a regular basis; tenancy reforms to record the rights of tenants and share croppers; consolidation of holdings; prevention of the alienation of tribal lands; providing access to wastelands and common property resources to the poor on a group basis; leasing-in and leasing-out of land were permitted within the ceiling limits; and preference to women in the distribution of ceiling surplus land

and legal provisions for protecting their rights to land.

Policies Related to Agricultural Development

A. Sustainable Agriculture and Rural Development (SARD)

The major thrust of agricultural development programs in India is improving efficiency in the use of scarce natural resources, namely: land, water and energy.

This can be achieved only through improved productivity in a cost-effective manner.

Balanced and integrated use of fertilizers, agricultural credit, institutional support, accelerated investments in agriculture, enhancing the competitiveness of agro-exports, creation of additional irrigation facilities, etc. have been given encouragement through various schemes and activities of the Government.

1. Rehabilitation of Degraded Land

A wide range of approaches have been employed to address problems of land degradation, some of these include:

- Prevention of soil loss from the catchments.
- Promotion of multi-disciplinary integrated approach to catchment treatment.
- Improvement of land capability and moisture regime in the watersheds.
- Promotion of land use to match land capability.
- Reduction of run-off from the catchments to reduce peak flow into the river system.
- Upgrading of skills in the planning and execution of watershed development programme.
- Increase of productivity of land affected by alkalinity for increasing sustainable agriculture production.
- Identification of critical degraded areas.
- Generation of data on land suitability and capability for regulating land use.
- Preparation of soil resource map and inventory of soil and land resources.
- Development of technical skills in soil and water conservation.
- Building up and strengthening of land capability of State Land Use Boards.

Various soil and water conservation programs have been launched in response to the need to conserve and rehabilitate degraded land, including:

- Strengthening of State Land Use Boards (SLUBS);
- Creation of the National Land Use and Conservation Board (NLCB);

- Setting up of a Soil Conservation Training Centre DVC Hazaribagh;
- Centrally sponsored Scheme of Soil Conservation for Enhancing Productivity of Degraded Lands in the Catchments of River Valley Projects;
- Centrally Sponsored Scheme of Soil Conservation in the Catchments of Flood Prone Rivers;
- Centrally Sponsored Scheme for Reclamation of Alkali (Usar) Soils;
- EFC Assisted Project for Reclamation and Development of Alkali land in Bihar and U.P.;
- Uttar Pradesh Sodic Land Reclamation Project with World Bank assistance;
- Watershed Development Project in shifting Cultivation Areas of North Eastern States (WDPSCA);
- Indo- German Bilateral Project on Watershed Management;
- Reclamation of Marginal and shallow ravines in the states of Uttar Pradesh, Madhya Pradesh, Gujarat and Rajasthan;
- Centrally Sponsored Scheme for Reclamation of Saline Soils including Coastal Saline and Sandy Areas;
- Centrally Sponsored Scheme for Amelioration of Acid Soils.

2. Integrated Pest Management

To alleviate the ill effects of pesticides, India adopted Integrated Pest Management (IPM) as a policy in 1985, and it has been a prominent feature of Five Year Plans since.

In fact, India was the first country in Asia to adopt the policy. One concrete offshoot of this policy is the establishment of the Central IPM Centre (CIPMC), which has a presence in each state. Its tasks include conduct of crop surveys, training of IPM trainors, and rearing natural control agents.

3. Water Resources Management

The projected total water demand by the year 2025 is around 1,050 cubic kilometres against the country's utilizable water resources of 1,132 cubic kilometres.

The share of agriculture in total water demand by the year 2025 is expected to be about 74 to 75 percent. Irrigation, being the major water user, will have to take a lower share by 2025, from the present 83 percent to 74 percent, due to more pressing and competing demands from other sectors.

Water has already become one of the most limited resources in the country. To address the scarcity of water both in quantity and quality, national programs (Preventive & Mitigative Action Plans) have been launched, including:

1. **Setting up guidelines for ground water extraction and use.**

The use of ground water for irrigation as well as industrial and household use has been increasing in the last two decades. Aquifers are at risk of drying up in some parts of the country because of indiscriminate extraction of ground water.

The Central and State Ground Water Boards have, therefore, prepared Ground Water Availability Maps and prescribed extraction rates to ensure that extraction is balanced with replenishment.

The country has been ZONED depending upon whether water is available in plenty, or has already become scarce in the region.

Accurate determination of ground water reserves can be done through actual Bore Hole Data in a given region.

Extraction of ground water is prohibited in some regions where water depletion has already become critical.

2. Management of lakes.

Natural and man-made lakes happen to be a major source of water supply in many regions in India.

Water use efficiency is presently estimated to be only 38 to 40 percent for canal irrigation and about 60 percent for ground water irrigation schemes.

3. Water pricing.

The Committee on Pricing Water (formed in accordance with the National Water Policy, 1987) is charged with rationalizing water rates and has suggested an increase in irrigation water rates in a phased manner.

The pricing of water for various uses will have to take into account the paying capacity of the users, including farmers and large sectors of the population living below the poverty line.

B. De-regulation and Liberalization of Agriculture

Since the start of liberalization, several policy measures have been taken with regard to regulation and control, fiscal policy, exports and imports, taxation, exchange and interest rate control, export promotion and incentives for high priority industries.

Food processing and agro industries have been given high priority and enjoy a number of incentives.

Wide-ranging fiscal policy changes have been introduced progressively. Excise and import duty rates have been reduced substantially. Many processed food items are totally exempt from excise duty.

Custom duty rates have been substantially reduced on plants and equipment, as well as on raw materials and intermediates, especially for export production.

Overall, the rates of protection and deprotection of the sector resulting from agricultural policies have been relatively low; however, there have been substantial variations in the rates of protection across commodities. Non-tariff barriers have had a bigger impact than tariff barriers.

According to the WB, before 1991, or the year of accession to the Agreement on Agriculture (AoA), almost all of India's tradable agricultural commodities were protected by non-tariff barriers.

Exports of most agricultural goods, except traditional exports such as tea, coffee, spices, and jute, were subject to quantitative restrictions (QRs).

In the 1950s and 1960s, export taxes were imposed on traditional exports. Although trade has been greatly liberalized between 1991 and 1995, there have been reversals as well.

Barriers have gone up on more than three-quarters of agricultural commodities, including rice and wheat imports. QRs now apply to exports of most commodities, with the exception of *Basmati* rice and durum wheat.

C. Public Investment in Agriculture

Public sector investment has played a crucial role in the development of infrastructure like irrigation, electricity, agriculture research, roads, markets and communications.

Investment in agriculture declined from 1.6 percent of GDP in 1993-94 to 1.3 percent in 1998-99. This decline was due to a fall in public investment from Rs. 4,467 crores in 1993-94 to Rs. 3,869 crores in 1998-99.

The declining trend in public sector investment will need to be reversed by better targeting of subsidies, increasing investment in productive assets such as irrigation, power, credit and developing rural infrastructure.

On the whole, however, public spending on agriculture as a proportion of GDP has been much higher in India than in other countries.

Despite this, agricultural growth in India has been slower.

The WB (1996) has suggested two reasons for this: (1) that public spending across regions or states is not geared towards a more rapid, broad-based and poverty-alleviating agricultural growth; and (2) that apart from the fact that public spending is disproportionately skewed towards subsidies and against growth-enhancing investments and expenditure on operations and maintenance of existing stock of capital, this skewing also contributes to the poor quality and reliability of the delivery of inputs, such as power and water.

Table 14. **Gross Capital Formation Agriculture (at 1993–94 Prices)** ***(Rs. Crore)***

Year	Gross Capital Formation				Percentage Share of			Investment in Agriculture as Percentage Share of GDP
	Agri–culture	Total Economy	Public Sector in Agri–culture	Private Sector in Agri–culture	Public Sector in Agri–culture	Private Sector in Agri–culture	Agri–culture to Total	
1993–94	13,523	181.133	4,467	9,056	33.0	67.0	7.47	1.6
1994–95	14,969	229,879	4,947	10,022	33.0	67.0	6.51	1.6
1995–96	15,690	284,557	4,849	10,841	30.9	69.1	5.51	1.6
1996–97	16,176	248,631	4,668	11,508	28.9	71.1	6.51	1.5
1997–98	15,942	256,551	3,979	11,963	25.0	75.0	4.77	1.4
1998–99	14,895	243,697	3,869	11,026	26.0	74.0	6.11	1.3
1999–00	16,582	268,374	4,112	12,470	24.8	75.2	6.18	1.3
2000–01	16,545	274,917	4,007	12,538	24.2	75.8	6.02	1.3

Source: ***Central Statistical Organization***

Obviously, the scale and composition of public spending needs to be rethought and restructured.

D. State Support for Agriculture

1. Credit

Agricultural credit is disbursed through a multi-agency network consisting of Commercial Banks (CBs), Regional and Rural Banks (RRBs) and cooperatives.

Cooperative Credit Institutions have emerged over the years as the primary agencies for dispensing rural credit.

Cooperatives have a sizeable presence and play a significant role in meeting the short-term requirements of agriculture.

However, several developments in recent years have saddled the Co-operative Credit Structure (CCS) with severe problems, which have restricted their ability to function viably and perform effectively the task of reaching out to all segments of the farming community and meet their credit requirements in full.

Hence, a proposal to revamp the CCS is being studied by the government.

Table 15. **Flow of Institutional Credit to Agriculture *(Rs. Crore)***

Institutions	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004 *(est.)*
Co-operative Banks	**14,085**	**15,957**	**18,363**	**20,801**	**23,604**	**24,296**	**30,080**
Share (%)	**44**	**43**	**40**	**39**	**38**	**34**	**38**
Short Term	10,895	12,571	14,845	16,583	18,828	20,247	23,920
Medium/Long Term	3,190	3,386	3,518	4,218	4,776	4,049	6,160
Regional Rural Banks	**2,040**	**2,460**	**3,172**	**4,219**	**4,854**	**5,467**	**6,080**
Share (%)	**6**	**7**	**7**	**8**	**8**	**8**	**8**
Short Term	1,396	1,7107	2,423	3,245	3,777	4,156	4,680
Medium/Long Term	644	50	749	974	1,077	1,311	1,400
Commercial Banks	**15,831**	**18,443**	**24,733**	**27,807**	**33,587**	**41,047**	**43,840**
Share (%)	**50**	**50**	**53**	**53**	**54**	**58**	**55**
Short Term	8,349	9,622	11,697	13,486	17,904	21,878	23,400
Medium/Long Term	7,482	8,821					

Source: ***NABARD***

At the same time, the government, through the Reserve Bank of India (RBI), has required private banks to lend 20 percent of their portfolio to the agriculture sector, particularly to small and marginal farmers.

In 1998-99, 18 percent of banks' priority sector lending (fixed at 40 percent of net bank credit) had been earmarked for agriculture.

By March 2001, the outstanding credit to agriculture accounted for 15.7 percent of net bank credit.

In March 2001 compared to 15.8 percent in 2000. Agriculture's share of net bank credit is expected to return to the desired level of 18 percent by the end of 10th plan (2002-2007).

During the Ninth Plan Period, total credit flow and achievement was as follows:

The Kisan Credit Card (KCC) scheme was introduced in 1998-99 to ensure timely, easy and flexible availability of production credit to farmers. Commercial banks, cooperative banks and RRBs are implementing this scheme. Each farmer is provided with a Kisan Credit Card (KCC) and a passbook to revolving cash credit facilities.

The farmer is permitted any number of withdrawals and repayments within a stipulated date, which is fixed on the basis of land holdings, cropping pattern and scale of financing. By June 30,2002, a total of 249.07 lakhs of KCC had been issued.

At the same time, the National Bank for Agriculture and Rural Development (NABARD) is promoting the concept of financing through self-help groups (SHGs). A beginning was made in this direction in 1991-92 by linking self-help groups with formal credit agencies.

Table 16. **Total Credit Flow and Achievements during the Ninth Plan**

Year	Short Term		NABARD Refinance	Investment *(MT/LT)*		NABARD Refinance
	Working Group Projections	Ground Level Credit Flow		Working Group Projections	Ground Level Credit Flow	
1997–98	22,500	20,640	5,270	10,875	11,316	3,305
1998–99	25,650	23,903	5,487	12,995	12,957	3,867
1999–00	29,250	28,862	5,145	15,530	15,750	4,377
2000–01	33,500	34,700		18,608	18,804	
2001–02	38,500	42,735		22,342	24,036	

Source: ***NABARD***

Table 17. **KCCs Issued up to June 30, 2002, by Agency, by Year *('000')***

Year	Cooperative Banks	RRBs	Commercial Banks	Total
1998–99	1.55	0.06	4.45	6.06
1999–00	35.95	1.73	13.66	51.34
2000–01	56.14	6.48	23.9	86.52
2001–02	54.36	8.34	30.71	93.41
2002–03 *(up to 30th June 2002)*	10.99	0.73	NA	11.72
Total	158.99	17.34	72.72	249.05
% Share	**63.84**	**6.96**	**29.20**	**100.00**

Source: ***NABARD***

By March 2000, about 114,775 SHGs had been linked with banks. Meanwhile, the RBI finalized in February 2000 the modalities of bank financing of SHGs and included it in the priority sector lending portfolio.

Under the Tenth Plan (2002-07) an estimated Rs.359,701 crore (US$ equivalent) has been earmarked for production credit, to be distributed through institutional sources, and an additional Rs.376,869 crore for investment credit, for a total Rs.736,570 crore.

2. Agricultural Subsidies

Subsidies have more often than not resulted in the uncontrolled use of ground water resources. In India, the right to ground water rests with the owner of the land. Hence, there is nothing to stop a group of farmers from using up the water on their land.

Subsidies to provide the poor with electricity have been quite taxing on the economy as a whole. Subsidies of this kind are tilted in favor of the input rather than the output, and hence result in less productivity. Hence, efforts should be made in the direction of output-based subsidy whereby the final outcome of the subsidy is more pronounced. The other factor that warrants examination is the distribution of subsidies. Efforts should be made to ensure that subsidies reach those who are poor in real terms rather than the comparatively well-off.

Fertilizer subsidies reflect the high cost borne by the fertilizer industry in India, which consists of plants of various vintages, less than efficient sizes and different technologies using a plethora of feedstock. Some plants are owned by the government and

others by cooperatives and the private sector. The fertilizer pricing committee (1998) pointed out that the present retention-pricing scheme for producers almost guarantees inefficiency. As more income-earning opportunities in agriculture arise, in part due to enabling policies, it is only fair that the income from the agriculture sector be taxed as well.

3. Support Price for Agricultural Products

Minimum support prices for major agricultural products are fixed and announced each year after taking into account the recommendations of the Commission for Agricultural Costs and Prices (CACP). The CACP, for its part, makes its recommendations after considering the following factors:

- Cost of Production
- Changes in Input Prices
- Input/Output Price Parity
- Trends in Market Prices
- Inter-crop Price Parity
- Demand and Supply Situation
- Effect on Industrial Cost Structure
- Effect on General Price Level
- Effect on Cost of Living
- International Market Price Situation (MSP)
- Parity between Prices Paid and Prices Received by farmers (Terms of Trade)

4. Farm Insurance

The Comprehensive Crop Insurance Scheme (CCIS) has been operating since 1985. It has thus far been implemented in 19 states and three Union Territories. It is based on an area approach and is linked to short-term credit. To improve the scope and content of the CCIS, a broad based National Agriculture Insurance Scheme (NAIS) or *Rashtriya Krishi Bima Yojana* was introduced in the country in the rabi season of 1999-2000. This scheme is available to all the states and Union Territories and covers food crops, horticultural crops, oilseed crops and commercial crops. All farmers are entitled to such insurance coverage. All yield losses due to natural, non-preventable risks are covered. Premium rates vary from 1.5 percent to 3.5 percent of the sum insured for food grain crops and oil seed crops. Small and marginal farmers are entitled to a premium subsidy of 50 percent, which would be phased out over a five-year period . The General Insurance Corporation (GIC) is the implementing agency.

The National Agriculture Insurance Scheme (NAIS) would be further strengthened during the 10th plan. Its coverage in terms of farmers, crops and risk commitments has been expanded and its premium structure rationalized.

5. Agriculture Extension

The Government is encouraging NGOs to take on a pro-active role in agriculture extension. In fact, the Department of Agriculture and Cooperation, along with NABARD, has already introduced a scheme to establish agri-clinics/ agri-business centers/

ventures to be run by agriculture graduates. The Indian Council of Agricultural Research (ICAR) is also involved in agriculture extension activities through its 314 Krishi Vigyan Kendra (Farm Science Centers), its Institute Village Linkage Programme (IVLP) and also through its institutes/ centers all over the country. It plans to strengthen links between research and extension to improve the quality and effectiveness of the research and extension system. The extension system will be revitalized and made more broad-based through KVKs, NGOs, farmer's organization, Cooperatives, agri-clinics, etc.

Factors Aggravating Unsustainability

Factors Constraining the Greening of Indian Agriculture:

Though the prospects are good for green agriculture in India, it is still not growing fast enough to motivate a larger section of the farming community to opt for organic agriculture.

The major problems hindering the growth of organic agriculture in India are listed as follows:

From producers/distributors/traders' point of view:

- Lack of proper infrastructure for distribution and conservation of bio-inputs is a major constraint that hinders the access of farmers to these inputs.
- Poor quality bio-inputs reduces the credibility of input providers. Lack of quality control mechanisms for bio-inputs reinforces the mistrust among farmers.
- The low penetration of the bio-inputs market and the limited shelf-life of the product are a disincentive to traders to store and sell bio-inputs.

From users' (farmers') point of view:

- Bio-fertilizers and bio-pesticides are perceived as less effective than chemicals.
- Some climatic regions and soil conditions are not suitable for specific strains of organic production.
- The limited shelf life (e.g., 4-6 months) of bio-inputs is another constraint to their adoption.
- Given the time it takes for a conventional farm to become fully organic (i.e., three years), farmers, in general, and small and marginal farmers, in particular, are unable to appreciate the benefits from switching to organic farming given their short-term orientation practice.

From promoters' (Government's) point of view:

- Agricultural departments, research institutions and extension services have for long been oriented towards chemical input agriculture and would therefore need to be reoriented towards organic (green) agriculture.
- Changing the cropping and cultivation patterns is a slow and time-consuming process given the high levels of illiteracy and large number of small and marginal farmers.

- Subsidies on chemical fertilizers and pesticides impede the growth of organic agriculture.

Factors Limiting the Growth of the Organic Products Market

- Lack of market information in general and organic market information in particular is the biggest barrier faced by Indian organic agriculture. The current information base is low and even the limited information available does not get disseminated due to lack of adequate channels for dissemination. As a result, farmers are in a predicament, as they are unable to attune their production practices to market changes. A marketing network specifically for organic products has not yet been developed for both the domestic and export markets.
- The quality of the Indian food industry is always a constraint to growth; inconsistent quality and contamination in food products are hindrances to capturing a big share of the international market.
- The high cost (Rs.22,000 to Rs.29,200 per certification) *(Garibay S V and Jyoti K, 2003),* not to mention the time it takes to get farms certified as organic, and the complexity of the whole process is a major deterrent to the development of organic production in the country, particularly among small farmers.
- Government has shown little interest in organic agriculture, i.e., there is still no direct support from government in terms of subsidy or market support for organic agriculture.
- Lack of proper infrastructure, i.e., farm-to-market roads, cold storage facilities, and transportation, affects the cost, quality and reach of producers.
- Indian organic agriculture is very fragmented; there are no organizations managing the entire value chain of organic products.

Many of the problems listed above are due to the relative newness of this sector from the point of view of the different players.

Sustainable Agriculture Initiatives and Insights

Factors that promote the Greening of Indian Agriculture

Despite constraints, groups still push for organic agriculture because it offers economic opportunities for different stakeholders. Some of the drivers that facilitate the growth of organic agriculture in India are:

- Growing export market for organically grown crops *(Kortbech-Olesen, 2003)*
- Price premium of 10-100 percent for organic agriculture products *(V. Garibay, K. Jyoti, 2003)*
- Diverse agro-climate regions across the country that can support a wide range of crops that cater to different market demands
- Increasing awareness and health consciousness, especially among certain sectors of domestic consumers

- Availability of comparatively cheap labor for labor-intensive organic agriculture
- Huge numbers of small farmers that are engaged in traditional farming and have very limited capacity to pay for chemical inputs for agriculture *(Planning Commission, 2001)*
- Presence of non-government organizations (NGOs) as active promoters of organic farming in different agro-climatic regions *(Donthi N. Reddy, 2001)*
- Increasing involvement of private companies in agricultural extension, trade, consulting and other services
- Greater government attention and support for organic agriculture through various policy initiations and action programs.

Non-Government Organizations have been playing a crucial role in promoting organic agricultural practices in the country. However, changing agricultural practices requires change in the culture and mindset of farmers, which can only be achieved by a long-drawn program. NGOs have demonstrated capabilities to this effect. An example of public-private partnership is the successful story of Spice Board's involvement of NGOs to enhance organic production of spices in Kerala, Tamilnadu, Andhra Pradesh and North Eastern states *(Shenoy, 2003).*

The following measures/initiatives have been recommended to promote Green Agriculture in India:

From traders' point of view:

- Establishment of a unit within the Ministry of Commerce and Trade that is dedicated to providing information on organic agricultural export market potentials in different parts of the world and the price premium that different products command
- Establishment of a Special Organic Agriculture Trade Zone (OATZ) for the domestic and export markets that can help traders get access to farm products, and consumers, to agro- based food processors and retailers
- Tax breaks/ incentives for traders/exporters dealing in organic products.
- Government subsidies and financial assistance for organic food processing industries, as well as the necessary facilities to enhance the prospects of organic exports.

From producers' point of view:

- Popularization of existing schemes to promote the use of bio-fertilizers as well as other bio-inputs
- Assistance in the marketing of bio-inputs, specifically through the government network, and also involving the network of co-operative societies at village level in the distribution of these bio-inputs
- Improvement of infrastructure, like roads, transportation facilities, storage facilities, etc., to enhance the forward and backward links in the organic products supply chain
- Promotion of corporate research on organic agronomic practices, bio- control of diseases and pests, and bio-fertilizers, etc.
- Gradual phasing out of the subsidy for synthetic fertilizers/pesticides and grant of subsidies for promotion of bio-inputs

- Grant assistance in the form of financial assistance in converting traditional into organic farms and support, especially for small and marginal farmers, for certification expenses
- Expansion of the scope of agricultural extension services with a specific focus on organic agriculture through collaborative engagement with NGOs, who are actively working in the rural areas *(Scialabba, Nadia, 2000).*
- A special insurance scheme for organic farmers
- Promotion of contract farming based on organic agriculture as has been done in Madhya Pradesh.

From institutions' point of view:

- The promotion of organic agriculture requires inter-ministerial coordination in the Central Government. Forming a Steering Committee consisting of various ministries at Central Government level (agriculture, commerce and trade, environment, science and technology, finance) would be a move in the right direction.

This committee should help increase the effectiveness of policies and programs directed at promoting organic agriculture.

At state level, some of the institutions that require coordinated action include agriculture universities, state agriculture department, private business organizations, and NGOs.

Each of these institutions can enhance their contribution towards greening Indian agriculture by developing a detailed program of action. For instance, the work program of agriculture universities can include re-orienting their current educational activities, research agenda, and extension service programs, as described in the matrix below:

Education	Research	Agriculture Extension
From:	***From:***	***From:***
❖ Traditional subjects and practices which are mainly focused on high productivity	❖ Research that is focused on increasing productivity through the intensive use of chemical fertilizers and pesticides. ❖ Research focused on development of chemical based methods for controlling plant diseases and pests.	❖ Information dissemination that is focused on conventional land use and cropping practices.
To:	***To:***	***To:***
❖ Incorporation of new subjects and syllabus with focus on sustainable and organic agriculture. ❖ Introduction to environmental impact of agriculture practices.	❖ Research that gives adequate attention to alternative patterns of agriculture with emphasis on environmentally benign and sustainable agriculture.	❖ Global and local market opportunities for organic agriculture produce and the price premium they carry. ❖ Organic agronomic practices, organic control of diseases and pests. ❖ Promotion of the use of bio-fertilizers and bio-pesticides.

Future Directions and Actions: A Perspective

Experience elsewhere shows that government has to play a key role in the development of organic agricultural production and in enhancing marketing opportunities for such products *(Scialabba Nadia, 2000)*.

Towards this end, there is a need for a policy framework to support the greening of agriculture in India.

A favorable policy environment can help create the market conditions that would encourage the production of bio-inputs, which could in turn propel changes in cropping patterns in favor of organic practices.

The attention being given by government to organic agriculture, both in terms of policy

Case Study

In the past 10 years, Institute for Intergrated Rural Development (IIRD) has contributed effectively to promoting organic agriculture through information exchange, awareness raising, standards development, and by increasing the role of women in multi-dimensional functions of agriculture at the local (Paithan Taluka of Maharashtra State), national (India) and regional (Asia) levels.

IIRD's objective is to find alternatives to the current chemical, non-viable and environmentally destructive modes of conventional agriculture, as well as to bring about environmental, socio-economic and cultural stability and sustainability through agriculture.

Objectives and purpose:

- *To find alternatives to the current chemical, non-viable and environmentally destructive modes of conventional agriculture.*
- *To bring about environmental, socio economic and cultural stability and sustainability through agriculture.*

Duration: *From 1987 to present*

The process was initiated by: *Social activists, reformers and women leaders from Maharashtra, India and the chief functionary of the project, Dr. Alexander Daniel.*

Needs addressed:

- *poverty alleviation*
- *food security*
- *environmental sustainability*
- *capacity-building of communities*

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and institutional support, has been marginal. The Ministry of Commerce is mandated to register farmers wishing to convert to organic operations but before farmers can be registered thus, they need technical assistance from the Ministry of Agriculture which is currently unavailable *(Scialabba Nadia, 2000).*

Government needs to be involved not just in standardization and accreditation procedures, but also in giving proactive support to inspection and certification and market-oriented services designed to equalize opportunities among organic producers.

Otherwise, the export of certified organic products risks becoming the monopoly of large farmers, or of highly organized groups of small holders. *(Scialabba Nadia, 2000).*

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Most outstanding outputs:

- *evolution of organic standards for India*
- *networking of initiatives for organic agriculture in Asia*
- *organizing a regional scientific conference*
- *increased awareness of organic agriculture in Paithan Taluka*

Most significant contribution to sustainable agriculture and land use management:

- *establishment of standards for organic production methods and processing in India*
- *exchange of organic farming methodes between different stakeholders in India and Asia through networking programs and conferences*
- *development of market outlets for organic produce to encourage organic production*
- *capacity building of policy-makers, researchers, farmers, processors and certifying bodies in organic agriculture methodologies*
- *establishment of a School for Organic Agriculture*

Extent of impact:

- *organic farmers and processors in India were able to avail themselves of standards for organic production and processing of products*
- *a regional (Asia) scientific conference aimed at sharing organic farming methods was organized in December 1997, in which around 500 participants consisting of scientists, policy-makers, farmers, processors, research and educational institutions and voluntary sectors were able to interact with each other and exchange ideas*
- *an outreach program linking six initiatives of organic agriculture in the Asian region, specifically Nepal, India, Sri Lanka, Japan, China and Philippines, started in March1999*
- *as a result of regular grassroots community education and action programs, organic agriculture has been promoted in 84 villages in Paithan Taluka of Maharashtra State in India*

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Methods used to monitor and evaluate multi-functional impacts:

- *increase in awareness among the different stakeholders of organic agriculture in the region*
- *changes in agricultural policy at local, national and regional levels*
- *increase in demand and expansion of markets for organic produce*

The most import elements (key ingredients) which contributed to success:

- *the need expressed by stakeholders involved in food production and by consumers for alternative, environmentally sound methodologies for food production*
- *present depressing socio-economic situation among farmers due to non-viability of existing resource-intensive methodologies*

Factors that might affect replicability:

- *local environmental conditions*
- *existing agricultural policy*
- *social attitudes and consumer behavior*
- *political situation*
- *trade relations*

Factors that influence sustainability:

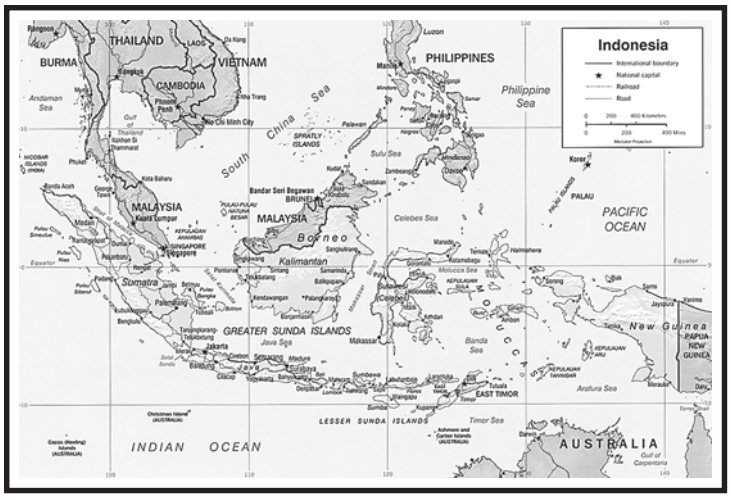
- *ethical behavior of society*
- *proper policy mechanisms*
- *proper inter-linking mechanisms of different roles in agriculture*
- *effective interaction and participative mechanisms*

The most important lessons learned:

- *proper networking was possible at all levels (local, national and regional level)*
- *information exchange was made possible at all levels*
- *social and cultural importance was emphasized*
- *women have to be involved as prime mobilizers in the process of shifting from conventional agriculture to organic agricultural system.*

How this case enhanced the multiple use of agricultural land and water:

- *land use, which was perceived only from the economic context, is now seen as a way to transform social behavior to bring about environmental sustainability. With this change in the thought process, all the components of nature would be effectively and sustainably managed*
- *opening of market outlets for marketing of organic produce*
- *an increased role for women in decision-making in organic agriculture*



Indonesia

National Agriculture Situationer

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Agriculture in Indonesia's Economy

Agriculture's contribution to Indonesia's economy has been declining over the past few decades. From 1965 to 2002, its share of the economy has gone down by 70.2 percent. *(See Table 17)*

Nonetheless, agriculture continues to play an important role in the economy because of its job-creation potential and foreign exchange earnings.

The country's agriculture sector grew briskly from 1978 to1986, with growth rates averaging 5.72 percent a year. From then on, however, until 1997, the sector's performance has progressively declined, primarily because of government policies that prioritized the development of the industrial and service sectors, disregarding the fact that nearly half of Indonesia's population live in rural areas, and 70 percent of them earn their living from agricultural activities.

The 1997 Asian financial crisis, followed by the downfall of the Soeharto regime, further depressed growth in agriculture (1.57 percent), particularly in the animal husbandry sector.

Table 18. **Contribution of Agriculture, Industry and the Service Sector to Indonesia's Economy *(percent)***

Sector	1965	1975	1985	1995	2000
Agriculture	57.1	30.2	22.9	17.1	17.0
Industry	12.5	33.5	35.3	41.8	47.0
Service	31.4	36.3	42.8	41.1	36.0

Source: ***Arifin, 2004***

Table 19. **Growth Rate of Agriculture Sector *(percent/year)***

Description	Consolidation 1967-78	High Growth 1978-1986	Deconstruction 1986-1997	Economy Crisis 1997-2001
Food Crop	3.58	4.95	1.90	1.62
Estate Crop	4.53	5.85	6.23	1.29
Husbandry	2.02	6.99	5.78	-1.92
Fisheries	3.44	5.15	5.36	5.45
Average	**3.39**	**5.72**	**3.38**	**1.57**

Source: ***Arifin, 2004***

The worldwide economic recession and Indonesia's multi-faceted domestic crisis also undermined the performance of agricultural exports – including animal products, food and horticultural plants, and primary plantation crops and their processed products. In 2001, agricultural exports accounted for 4.05 percent of the country's total exports; in 2002, its share rose to 4.47 percent. Thus, in two years, the share of agricultural exports grew by a mere 0.42 percent *(Badan Pusat Statistik).* In the world's agriculture market, Indonesia contributed only 1.39 percent in 2000. This lackluster performance has been the trend in the last few years and persists to this day, in contrast to other Asian countries, such as China, Thailand and the Philippines, where agricultural exports have been increasing.

Table 20. **The Value and Market Share of Agriculture Product World Export in the World During 1998–2000, Several Countries**

Country	Value *(US $ billion)*			Market Share *(%)*	
	1998	1999	2000	1999	2000
World	562,270	545,640	558,280	12.2	9.0
China	14,314	14,209	16,384	16.2	6.6
Thailand	11,523	11,762	13,278	33.8	19.2
Malaysia	9,539	9,214	7,681	25.5	7.8
Indonesia	7,706	7,544	7,764	16.2	12.5
Philippines	2,201	1,771	2,538	20.9	6.4

Note: ***Agriculture product consist of primary and processed product***
Source: ***Forum WTO–Indonesia, 2000***

Table 21. **Export–Import and Trade Balance of Indonesia Agriculture Product During 1997–2001** ***(in US$ thousand)***

Commodity	1997	1998	1999	2000	2001
Food Crop					
Export	110,575	157,185	91,187	59,059	56,363
Import	1,768,871	1,888,011	2,426,336	1,735,697	1,404,472
Deficit	*-1,658,296*	*-1,730,826*	*-2,335,149*	*-1,676,638*	*-1,348,109*
Estate Crop					
Export	5,180,116	4,079,889	4,092,807	3,887,184	3,444,386
Import	1,522,338	1,247,042	1,427,774	1,257,265	1,550,976
Surplus	3,657,778	2,832,847	2,665,033	2,629,919	1,893,410
Horticulture					
Export	140,921	77,678	352,270	298,853	156,788
Import	224,668	113,111	137,219	237,710	464,261
Deficit	*-83,747*	*-35,433*	*215,051*	*61,143*	*-307,473*
Husbandry					
Export	66,947	112,247	118,430	204,076	224,602
Import	626,322	281,197	398,143	634,184	475,882
Deficit	*-559,375*	*-281,197*	*-279,713*	*- 430,108*	*-251,280*

Source: ***Badan Pusat Statistik, 1997–2001***

The development of the world's agricultural produce and its segments from 1998 to 2000 is shown in Table 20.

The data in Table 21 indicates that nearly all agricultural produce recorded a trade deficit, except for the plantation plants subsector which saw a surplus. The balance of plantation product exports and imports in the last five years has consistently shown a decline.

Food crops recorded a deficit from 1999 to 2001, which was attributed to increased imports and decreased food crop production during the period, particularly rice, corn, soybean, sweet potato and green beans.

Horticultural plant commodities experienced a deficit in 1997, 1998 and 2001, and then a surplus in 1999 and 2000. Low

Table 22. **Percentage of State Budget Allocation in Indonesia 2001–2003**

Sector	2001	2002	2003
Industry	3.5	3.5	1.6
Agriculture	7.1	7.1	7.3
Irrigation	7.1	7.1	7.3
Education, Culture, Youth & Sport	22.1	21.6	23.1
Welfare	8.6	9.4	10.1
Defense and Security	5.4	7.5	11.0

Source: ***Badan Pusat Statistik, 2003***

import duties on horticultural products caused a flood of imports in the domestic market.

In the animal husbandry sub-sector, the increase in importation and the consequent trade deficit was due to the inadequacy of domestic supplies to meet demand. On the other hand, the prices of imported raw materials, such as animal feed, continued to rise during the last three years (1998-2001).

Meanwhile, agriculture received only 7.1 to 7.3 percent of the budget in 2001-2003 *(see Table 22),* compared to defense and security, for instance, which accounted in 2002 for 46.7 of the budget.

Macro Policies and Global/National Tendencies Affect Agricultural Sustainability

In an attempt to increase exports and control the importation of agricultural products, the Ministry of Agriculture has phased its targets as follows:

a. Short Term (2003–2004), agricultural commodities that could stabilize Indonesia's economy, meet the basic needs of the general public, increase exports, and protect domestic agriculture.
b. Medium Term (2005–2007), agricultural commodities that could increase agricultural exports and guarantee domestic food security.
c. Long Term (2008–2010), agricultural commodities that could increase the overseas market segments by improving product competitiveness.

In the short term, the Ministry of Agriculture would focus on 15 strategic commodities: ***food crops*** including rice, soybean, corn removed from the cob; ***plantation crops***, including sugar, oil palm, coconut, rubber, coffee, and cashew; ***animal husbandry products,*** including leather skin, chicken, and milk; ***horticulture crops,*** including onions and oranges.

Given the adverse impact of free trade, however, even the short-term targets set by the Ministry of Agriculture might prove unattainable. Data in Table 23 indicates that from 1995-2000, or following the implementation of the Agreement on Agriculture (*AoA*), the volume of most agricultural imports increased sharply, while the volume of exports declined, compared to the period prior to enacting the *AoA*.

To this day, many products of ASEAN countries, particularly Indonesia, are barred entry to developed country markets by Sanitary and Phytosanitary (SPS) standards and Technical Barriers to Trade (TBTs). The SPS standards were written into the WTO agreement and are intended to guard against contaminated agricultural imports. This form of restriction has a significant impact on Indonesia's proposed strategic products, namely rice, soybean and sugarcane.

The implementation of regional autonomy will transfer the responsibility for the management of natural resources from the central government to the regions. As a result, the regions would be able to adapt macro policies to their specific needs and circumstances.

For instance, while setting the price of unhulled paddy is still the prerogative of central government, the regional governments – provincial and district governments – can formulate micro-policies such as establishing a fund to stabilize prices. If prices fall, the regional governments can opt to purchase unhulled paddy at guaranteed prices. The same kind of protection may be extended to other strategic commodities.

Regional governments that choose to intervene should be able to balance the benefits and costs of setting the price of agricultural commodities. At the very least, such action

Table 23. **The Export–Import Value of Food Crop in Indonesia *(in US $ thousand)* During 1984–1994 *(before AoA)* and 1995–2000**

Commodity	1984–1994		1995–2000	
	Import	Export	Import	Export
Rice	648,018	216,010	4,268,200	3,264
Sugar	646,063	613,000	2,311,474	10,169
Soybean	1,579,672	2,201	1,314,782	281
Red Onion	13,989	57	21,786	64
Chicken	6,887	6,955	17,900	12,002
Egg	1,719	2,062	21,672	1,264
Banana	41	10,038	528	66,737
Mango	35	4,854	397	2,847

Source: **FAO**

should not be detrimental to peasant producers.

Fluctuating prices of food products and farm production facilities are quickly reflected at the peasant level. Price changes in the world market translate to relatively bigger price changes in the domestic market.

A. Rice

Table 24 shows that rice consumption from 1998-2002 fluctuated from year to year, and tended to increase. Rice imports grew in the same period following the implementation of the AoA and in the aftermath of the country's economic crisis. After 2001, the volume of rice imports declined, due to higher import duties: from 0percent to Rp. 430/kg (US$ 0.05).

In 2004, the government increased the basic prices of dried, husked paddy from Rp. 1,500 to Rp. 1,725 (US$ 0.18-0.20) a kilogram. Due to the inadequate implementation of price controls, however, dried, husked paddy generally sell for much less at Rp. 900 to Rp. 1,200 (US$ 0.11-0.14).

Siregar, M. *(2001)* cites several factors that work against price controls for paddy, as follows:

1. The recommended price of dried, husked paddy (Rp. 1,500/kg) (US$ 0.18) is considered too high given the current economic condition;
2. There are not enough funds for food procurement, especially after the abolition of KLBI (Liquidity Credit of Bank Indonesia) for Cooperatives and Bulog;
3. Under liberalization, the private sector is free to import rice at 0 percent duty;
4. The Special Market Operation (OPK), which bought rice in greater volumes and at lower prices (200,000 tons/month at Rp. 1,000/kg [US$ 0.12/kg]) affected the demand; and
5. Traders/the private sector doubt government's commitment to maintain the basic price for paddy.

The incongruence of policies related to this crop has also tended to undermine efforts to stabilize paddy prices.

For instance, while the Ministry of Agriculture has raised the basic price of paddy for the benefit of the peasants, the Ministry of Industry and Trade has opened the country to a flood of cheaper-priced imports, sending rice prices on a nosedive.

In August 2000, rice was selling at US$ 169/ton or Rp.1,850/kg in the world market, while domestic rice was priced as high as Rp. 2,450/kg (US$ 0.29/kg). The trend continued in the first quarter of 2001, when world rice prices reached US$ 150/ton, while domestic rice prices averaged Rp. 2,100/kg (US$ 0.25).

B. Soybean

The demand for soybeans increased from 1997 to 2002 by an average of 3.48 percent a year, while soybean production decreased by 8.6 percent a year in the last decade. The demand was fueled by several food processing industries, such as makers of tofu, tempe, ketchup and tauco.

Domestic soybean production has been able to meet only 70 percent of domestic demand. The shortfall has been made up by imports, which are cheaper. Soybean im-

Table 24. **Production, Export and Import of Rice During 1997–2002**

Description	YEAR						Average
	1997	1998	1999	2000	2001	2002	1997–2002
Area *(Ha)*	11,139,426	11,730,372	11,963,000	*11,793,475*	*11,499,997*	*11,568,013*	11,625,254
% up/down		*5.30*	*1.98*	*(1.42)*	*(2.49)*	*0.59*	0.68
Yield *(kwintal/Ha)*	44.32	41.97	42.52	44.01	43.88	43.95	43
% up/down		*(5.30)*	*1.31*	*3.50*	*(0.30)*	*0.16*	(0.16)
Production *(ton)* Husk Paddy	49,373,632	49,236,692	50,866,000	51,898,852	50,460,782	50,838,948	50,367,192
Production *(ton)* Rice	31,105,388	31,019,116	32,045,580	32,696,277	31,790,293	32,028,537	31,780,865
% up/down		*(0.28)*	*3.31*	*2.03*	*(2.77)*	*0.75*	0.46
Import *(ton)* Rice	349,681	2,895,119	4,751,348	1,355,666	644,733	428,474	1,999,309
% up/down		*727.93*	*64.12*	*(71.47)*	*(52.44)*	*(33.54)*	133.63
Export *(ton)* Rice	113	2,001	2,700	1,247	4,010	1,532	2.014
% up/down		*1.670.80*	*34.93*	*(53.81)*	*221.57*	*(61.80)*	374.70

Source: ***Ministry of Agriculture, 1997–2002***

Table 25. **Production, Consumption, Import and Export of Soybean Period 1997–2002**

Description	YEAR						Average
	1997	1998	1999	2000	2001	2002	1997–2002
Area *(Ha)*	1,119,079	1,095,071	1,151,000	824,000	678,848	799,085	973,600
% up/down		*(2.15)*	*5.11*	*(28.41)*	*(17.62)*	*17.71*	(9)
Yield *(kwintal/Ha)*	12.13	11.92	12.02	12.34	12.18	11.64	12.12
% up/down		*(1.73)*	*0.84*	*2.66*	*(1.30)*	*(4.43)*	0
Production *(ton)*	1,356,891	1,304,950	1,382,848	1,017,634	826,932	930,078	1,177,851
% up/down		*(3.83)*	*5.97*	*(26.41)*	*(18.74)*	*12.47*	(8.60)
Import *(ton)*	616,375	343,124	1,301,755	1,277,685	1,136,419	250,803	935,072
% up/down		*(44.33)*	*279.38*	*(1.85)*	*(11.06)*	*(77.93)*	44.43
Export *(ton)*	6	—	5	521	1,188	—	344
% up/down		*NA*	*NA*	*10,320*	*128*	*NA*	NA
Domestic Stock *(ton)*	1,973,260	1,648,074	2,684,598	2,294,798	1,962,163	1,180,881	2,112,579
% up/down		*(16.48)*	*62.89*	*(14.52)*	*(14.50)*	*(39.82)*	3.48

Source: ***Ministry of Agriculture***

ports, encouraged by the 0 percent duty that took effect in 1999, are expected to grow even further, especially following the abolition of the BULOG (Logistics Business Agency) as the country's exclusive soybean importer. An import duty of 27 percent has been proposed by the Ministry of Agriculture to protect local soybean production.

c. Corn

From 1997 to 2002 corn production showed an upward trend, growing by 1.8 percent a year.

Demand also tended to increase in the same period, by 1.17 percent a year, mainly because of increased consumption and rising demand from the corn-processing and animal-feed industries.

The Ministry of Agriculture has proposed a 40 percent import duty on corn in place of the current 0 percent duty.

d. Sugar

Table 27 indicates that sugar consumption exceeded average production from 1997 to 2001. Indonesia had therefore needed to import 1.64 million tons of sugar. Several problems plague the sugar industry in Indonesia, namely:

a. Many of the sugar factories are on Java island, and most of these are idle due to shortage of raw materials.
b. Because of the relatively high (compared to other agricultural imports) 5 percent duty on imported sugar, smuggling has become rampant, making imported sugar cheaper than local sugar.

To cope with the national sugar problem, the productivity of the existing sugar factories should be increased or, as a second option, new sugar factories should be constructed, particularly in outer Java.

In addition, the government has decreed that raw sugar imports can only be brought in for processing and should not be traded or consumed as such. Processed (crystal white) sugar may only be imported by registered sugar importers. The government has also guaranteed the farm gate price of sugar at no lower than Rp. 3,100/kg (US $ 0.36).

AFTA-CEPT (ASEAN Free Trade Area Common Effective Preferential Tariff Scheme)

The ASEAN Free Trade Area (AFTA) refers to the regional agreement whereby tariff and non-tariff barriers to products traded among ASEAN member countries are reduced to 0-5 percent.

The Common Effective Preferential Tariff Scheme (CEFT) is a phased program for tariff reduction and elimination of non-tariff barriers agreed jointly by the ASEAN countries.

Under the AFTA-CEPT, Sadewa *(2003)* forecast that Indonesia will see a mere 0.5 percent improvement in its Gross Domestic Product (GDP), compared to its Asian neighbors.

Table 26. **Production, Consumption, and Import of Corn Period 1997–2002**

Description	YEAR						Average
	1997	1998	1999	2000	2001	2002	1997–2002
Area *(Ha)*	3,355,224	3,847,813	3,456,357	3,500,318	3,286,000	3,306,000	3,489,142
% up/down		*14.68*	*(10.17)*	*1.27*	*(6.12)*	*0.61*	(0.07)
Yield *(kwintal/Ha)*	26.14	26.43	26.63	27.65	28.45	28.89	27
% up/down		*1.11*	*0.76*	*3.83*	*2.89*	*1.55*	1.72
Production *(ton)*	8,711,000	10,169,000	9,204,000	9,677,000	9,347,000	9,550,000	9,421,600
% up/down		*16.74*	*(9.49)*	*5.14*	*(3.41)*	0.02	1.80
Import *(ton)*	1,098,353	313,463	618,060	1,264,575	1,035,797	127,551	866,050
% up/down		*(71.46)*	*97.17*	*104.60*	*(18.09)*	*(87.69)*	22.44
Export *(ton)*	18,957	624,942	90,647	28,066	90,474	6,479	170,617
% up/down		*3,196.63*	*(85.50)*	*(69.04)*	*222.36*	*(92.84)*	652.89
Domestic Stock *(ton)*	9,790,396	9,857,521	9,731,413	10,913,509	10,292,323	9,671,072	10,117,032
% up/down		*0.69*	*(1.28)*	*12.15*	*(5.69)*	*(6.04)*	1.17

Source: ***Ministry of Agriculture***

Table 27. **Production, Consumption, Export and Import of Sugar Cane**

Year	Production (1,000 ton)	Consumption (1,000 ton)	Export (1,000 ton)	Import (1,000 ton)
1997	2.197	3.374	331,28	1.365
1998	1.496	2.739	167,93	1.730
1999	1.496	2.761	179,08	2.187
2000	1.691	3.020	—	1.567
2001	1.725	3.086	—	1.353

Source: ***Badan Pusat Statistik***

For instance, while Thailand has been able to increase its exports to ASEAN markets from US$6 billion to US$16 billion (or 22 percent of its total exports) from1993-2001, Indonesia's exports to ASEAN have grown only slightly (from US$5 billion to US$9.5 billion, or from 13.6 percent to 16.9 percent of total exports) in the same period.

Furthermore, the AFTA-CEPT scheme has been perverted by the rampant practice of using Singapore as a trans-shipment point for imports of non-ASEAN member countries. Products of China and the Middle East, for instance, may by this practice enter Indonesia's market at negligible import duties. Much of the cheap wheat flour that has flooded ASEAN markets in recent years is suspected to have come from China and India, even though it is supposed to have been imported from Singapore-based suppliers.

Indonesia's competitiveness is also undermined by political instability and by frequent labor disputes in the country. Moreover, Indonesia's policy of decentralization, giving the regions autonomy, has resulted in region-specific regulations that capitalists find burdensome.

This lack of competitiveness is evidenced by the low level of Foreign Direct Investment (FDI) in the country compared to its neighbors. This makes Indonesia less likely than other ASEAN countries to benefit from the AFTA-CEPT.

Impact Of Conventional Agriculture

Conventional agriculture, which is characterized by monoculture, high external input application, and species and genetic homogeneity, has impacted negatively on the agricultural and non-agricultural ecosystems.

The impact on the agricultural ecosystem is evidenced by (1) increased land degradation (physical, chemical and biological); (2) increased pesticide residue, and resistance to bacteria and weeds; (3) decreased biodiversity; and (4) negative effects on people's health as a result of environmental toxification.

Beyond the agricultural ecosystem, the impact of conventional agriculture is wit-

nessed in (1) diseases resulting from chemically contaminated food; (2) economic injustice due to monopolistic practices in the procurement of agricultural production facilities; and (3) social imbalance between peasants and non-peasants in the community.

Studies conducted by the Ministry of Agriculture indicate that there has been a real increase in the area of critical land, or land with less than 1 percent organic content. (To be suitable for agriculture, land must have an organic content of at least 2 to 5 percent.)

Between 1990 and 1999, land on Java island and in outer Java that is classified as critical increased from 65 percent to as much as 80 percent.

GMO Products

A genetically modified organism (GMO) that has caused a stir in Indonesia is the Bt cotton produced by PT Monagro Kimia, which is a part of the multinational company Monsanto and operates in South Sulawesi. PT Monagro began research on the Bt cotton in 1996. In 1999, the government pronounced Bt cotton as environmentally safe. In 2001, Bt cotton underwent trial tests on 4,400 hectares. Peasants complained that the Bt cotton caused drought and increased the bacteria population.

Meanwhile, studies conducted by YLKI (Indonesian Consumer Institution Foundation) in 2001-2002 showed that several food products processed from soybeans, corn, and potatoes contained genetically-engineered materials.

Before then, consumers had been unaware that many of their food purchases contained transgenic materials, despite the existence of Law Number 7/1996 on Food, which stipulates that "any food products containing transgenic raw materials shall be inspected in terms of their safety and shall be provided with a transgenic label".

Sustainable Agriculture

These trends support the shift toward sustainable agriculture practices.

Apart from being environmentally friendly, sustainable agriculture is a farming system that is efficient when outputs are compared to inputs.

The development of sustainable agriculture is particularly directed towards (1) reducing the negative impact on the land physically, chemically and biologically; (2) reducing the resistance and persistence of bacteria and shifting the emphasis to biological control; (3) improving the health of the agricultural ecosystem, so as to improve the health of the people and the peasants; (4) reducing the peasants' dependency on inputs in the form of external production facilities; (5) giving peasants' the right to make strategic plans and decisions.

Table 28. **Value of Organic Food Transactions**

Year	Transaction Value
World	
1997	US$ 10 billion
1998	US$ 13 billion
2001	US$ 26 billion
2010 *(projection)*	US$ 100 billion
Indonesia	
2002	Rp 5 billion/month = US $ 5.8 million

Currently, there is growing consumer awareness on the dangers of consuming contaminated agricultural produce, as shown in Table 28.

Indonesia's potential for developing organic agriculture is actually great. Indonesia has approximately 17 million hectares of idle land that can be put to such use. In addition, many peasants still practice traditional agriculture, which should make the adjustment to organic agriculture easier and faster. Crops such as durian, mangosteen, zalacca fruit, lanseh fruit and rambutan, are generally produced without any synthetic material inputs. Likewise, backyard crops such as medicinal plants and several plantation commodities, such as coffee, can be produced without any synthetic inputs either.

The ELSSPAT and BIOCERT (NGOs in Indonesia) estimate that organic agriculture in the country is growing at approximately 10 percent a year, and the growing number of supermarkets, outlets, and other alternative marketing models for selling organic produce in many cities can attest to this.

IFOAM has reported that around 40,000 hectares, or 0.09 percent of the country's agricultural land, are currently being farmed organically, and that Indonesia is ranked 37th worldwide in terms of organic land management.

However, the government itself has yet to come out with definitive data on the extent of organic farming practice in Indonesia.

Government Efforts Related to Organic Agriculture

In connection with the "GO Organic 2010" program, the Ministry of Agriculture has undertaken the following: (1) formulation of the Indonesian National Standard for Organic Food (SNI Number 01-6729-2002); (b) establishment of the Standardization

and Accreditation Center (PSA) as the competent authority on organic food pursuant to Decree of the Minister of Agriculture Number 432/Kpts/OT.130/9/ 2003.

The PSA has the following duties: (1) formulating policy on arrangements for, and control and supervision of the organic food production system; (2) designing and formulating the system and references for the establishment of the organic food certification institution; (c) supervising the certification institution and/or the business board that would implement the quality control system for organic agriculture in the certification program.

In connection with the above mandate, the Organic Food Task Force was established with representatives from: Government, Private Sector, Technical Experts, Drug and Food Supervisory Board (BPOM), National Standardization Board (BSN), National Accreditation Committee (KAN), Universities, Practitioners, Peasants/ Producers and Consumers.

Obstacles to Development of Organic Agriculture

There are several obstacles to the development of organic agriculture in Indonesia, such as (1) lack of consumer confidence in the organic certification system and/or institution; (2) lack of international accreditation for the organic certification; (3) not enough organic inspectors, particularly those who are acknowledged internationally; (4) insufficient awareness/knowledge among peasants of organic agriculture; (5) the long recovery and de-contamination period of land that had long been farmed with chemicals.

Opportunities for Peasant Groups Engaged in Organic Agriculture

There is a big domestic market for organic products. Supermarkets are a particularly lucrative market for organic growers in Indonesia. Unfortunately, peasants have generally been unable to take advantage of this opportunity because the big agribusinesses, especially those dealing in organically grown vegetables, have a corner on this market.

There are other obstacles to access to supermarkets by peasant organizations:

1. **Consumers are still skeptical on whether the organic requirements have been met.**
   - ❖ Organic products grown by peasant groups have not been formally certified as such. Only the big agribusinesses have been able to get organic certification for their products. Second-crop and vegetable peasants have a hard time because their land still contains chemical residues from the previous conventional agricultural practice. It would take three to five years to completely rid the land of such residues. Several peasant groups and NGOs have suggested that rather than the produce, the farming method may be certified as organic.
   - ❖ Irrigation water sources are not yet free from chemical contamination. Hence, peasants in a given area should agree not to use chemicals that could contaminate their common water source.

2. **There is no well-functioning quality control system at the peasant level.**
   In regard to organic rice, peasant organizations can help guarantee uniformity in the quality of their members' produce and that this complies with market demands.

3. **In general, the supermarket practice of delayed payment works against peasants who need to be paid on the spot to meet their household daily needs and to prepare for the next planting season.**

Apart from the difficulty of marketing their products, organic peasants often find that their products fetch prices that are not much higher than those offered for conventional commodities. And ironically, after selling their organic produce, peasants buy cheaper non-organic food for themselves.

There is therefore a need to help peasants realize that the point of organic farming is not merely to get a higher price for their crops, but to improve the fertility of the land, to restore to peasants the right to make farming decisions, to provide healthy food for their families, and to mobilize the spirit to resist the negative impacts of globalization.

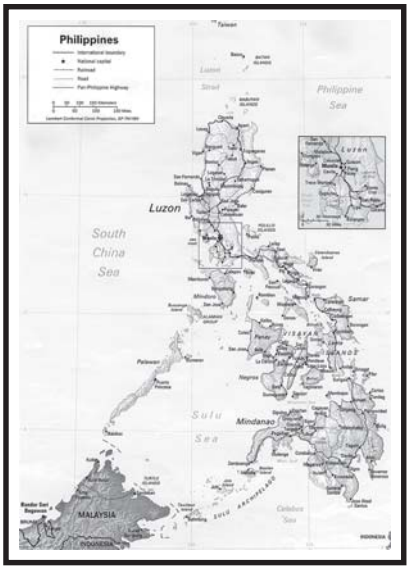
Conclusion

As a result of the government's policy to prioritize the industrial and services sectors, the role and contribution of the agriculture sector has declined, despite the fact that the majority of the Indonesian population depend on agriculture for a living.

This situation is made worse by the country's economic crisis and free trade regulations imposed under the WTO and AFTA regimes which undermine the competitiveness of the country's agricultural products.

Environmental destruction, as evidenced by the increase in critical land, has worsened the condition of the peasants who have to use more fertilizers to maintain their land's productivity. The introduction of GMOs is expected to exacerbate this problem.

There are high hopes that sustainable agriculture would help offset the impact of globalized trade and recover land fertility and preserve the ecosystem. However, the introduction of sustainable agriculture should be followed by a process to help peasants become aware of the long-term benefits of this new farming practice apart from the guarantee of a higher selling prices for their products.



Philippines

National Agriculture Situationer

Prepared by: Fr. Francis B. Lucas and Teresa Lingan–Debuque

Philippine Agriculture in Crisis

Agriculture and agribusiness make up the backbone of the Philippine economy. The country's population is predominantly rural (70 percent of the total) and two-thirds of these depend on farming for their livelihood. Seventy-one percent of the country's Gross Domestic Product (GDP) is produced by agribusiness, while primary agriculture and fisheries turn out some 21 percent. *(Tolentino, 2002)*

Since the early 1980s, however, Philippine agriculture has been in crisis. A number of trends in the sector gives proof of this, in particular, expensive food; stagnant productivity; increasing agri imports and falling agri exports; high production cost; market constraints; monopolies; and weak governance. Despite growth since 1985, the Philippines has been unable to duplicate the peak performance of the 1976-81 period. In fact, the Philippines has fallen out of the group of best performers to join that of the underachievers in agriculture Gross Value Added (GVA) and exports in Southeast Asia.

Stagnant Productivity

Throughout the 1990s, the country's population had grown at an average of 2.35 percent a year. In the meantime, rice production had not kept pace, registering a mere 1.9 percent growth in the same period. Since the 1980s, the productivity of Filipino rice farmers has largely stagnated, growing by only 0.4 percent a year. In contrast, Thai-

land had posted 1.2 percent growth in rice production during the 1990s, and Vietnam an impressive 3.0 percent.

Increasing Agri Imports, Falling Agri Exports

As a percentage of total rice supply, imports have been growing worryingly large in recent years. In 1975-1979 their contribution to the total supply of rice was a miniscule 1.13 percent. This grew to 8.09 percent in 2000-2001. At present, rice imports cost around US$180 a metric ton to US$220 a metric ton. This translates to PhP 10.00 to PhP 12.20 a kilo of imported rice. In contrast, the wholesale price of domestic rice is around PhP 18.21 a kilo. Considering this, rice importation is expected to escalate.

Table 29. **Imports Growing as % of Total Rice Supply***

Rice Imports as % of Total Supply*	
1975–1979	1.13
1980–1989	1.73
1990–1999	7.31
2000–2001	8.09

** Total Supply = prod'n + imports*
Data Source: ***BAS & NFA***

Expensive Food

Expensive rice has implications beyond purely economic ones. For 80 percent of Filipinos, 60 percent of their expenses are on food. The poorest Filipinos spend more: as much as two-thirds of their expenses go to food. Hence, an increase in rice prices has the effect of a wage cut. And it is not just the consumers that are hit hard by such price increases: even rice farmers buy their rice for at least part of the year.

The effect of expensive rice on Filipinos' consumption of the staple was clearly evident in 1997 to1999 when the Philippines registered the lowest rice consumption among nine countries in Southeast Asia.

Table 30. **Per Capita Consumption of Rice***

Country	Rice Consumption *(kilos/ head/ year)*
Bangladesh	161
Cambodia	164
Indonesia	151
Laos	172
Malaysia	90
Myanmar	211
Philippines	98**
Thailand	104
Vietnam	170

** average for 1997–1999*
*** lower than others due to lesser supply and higher price*
Source: ***FAO Agrostat Database***

Table 31. **Costs of Paddy Production *(1999)***

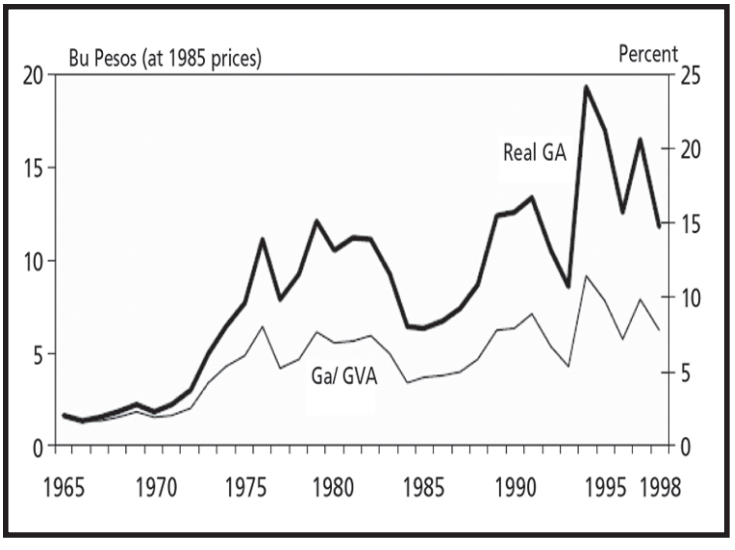
	P/ Ha
Central Luzon, Philippines	34,701
Central Plain, Thailand	24,859
Mekong Delta, Vietnam	26,712
West Java, Indonesia	26,197

Data Source: ***IRRI***

High Production Cost

Of four rice-producing countries surveyed in 1999, the Philippines recorded the highest production cost a hectare of paddy.

Figure 9. **Public Investment in Agriculture *(1965–1998)***



Public Investment in Agriculture

In the 1970s, irrigation and rural infrastructure dominated public investments in agriculture. Much of the investments in the 1980s and 1990s went to price support through the National Food Authority (NFA) and land acquisition payments to Land Bank of the Philippines (LBP) for the Comprehensive Agrarian Reform Program (CARP).

Weak Governance

Current Philippine agricultural governance is characterized by monopoly elements and regulatory constraints. Market constraints combine with stagnant productivity and inadequate public investment to suppress agricultural growth and farmer incomes and inhibit sustainable food security.

Reform efforts are constrained by discontinuity (i.e., the DA head has an average service of 19 months because of frequent leadership changes) and short-term political aspects in decision-making.

Agricultural Policies in Recent Years

After experiencing one of the highest growth rates in the region during the 1970s (4.9 percent average annual growth in Gross Value Added [GVA]), Philippine agricultural growth slowed down considerably in the 1980s (1.0 percent annual growth in GVA), and virtually stagnated during the 1990s (0.4 percent GVA growth).

To a large extent, the decline that started in the 1980s was a direct consequence of the severe financial crisis the country suffered during the Marcos regime's terminal phase. The government stopped building farm-to-market roads, irrigation facilities and other agri-related infrastructure, and became less generous with credit programs directed at farmers and fisher folk.

The shift to democratic governance in 1986 failed to arrest agriculture's decline. To some extent, this was due to the Aquino and Ramos governments' benign neglect of the rural sector.

The Aquino government was simply too preoccupied with the pressing task of keeping itself alive, thwarting one military-backed coup after another.

Rural development took a back seat to satisfying the economic requirements of the military and security establishment, even as the country went through another economic crisis during the early 1990s.

Funds allotted for irrigation, for instance, were not even enough to keep the existing infrastructure from deteriorating.

The Ramos government came up with the "Gintong Ani" program, which focused on providing cheap loans to farmers. Loans were offered to farmers at 25 percent less than the prevailing rates offered by the Land Bank of the Philippines (LBP). However, "Gintong Ani" failed in its avowed mission to revive Philippine agriculture as a prolonged drought caused by El Niño wreaked havoc in the late nineties with agricultural production dropping by more than 10 percent in 1998.

The dry spell coincided with another financial crisis precipitated by the devaluation of the peso. This made it impossible for the government to come up with the massive resources needed to turn the sector around.

President Gloria Arroyo's "Ginintuang Masaganang Ani" (GMA), on the other hand, envisions a modernized and productive agriculture and fisheries sector.

In particular, it aims to promote food security and competitive self-sufficiency in rice through four main measures: (1) modernized productivity in corn and other feed crops; (2) diversification; (3) livestock enterprise development; and (4) recovery and growth of the fisheries sector.

The Medium-Term Philippine Development Plan for 2000-2004 commits the Arroyo government to the pursuit of comprehensive rural development based on three key strat-

egies, namely, productivity improvements, asset distribution reform, and sustainable development.

Raising agricultural productivity entails giving farmers and fisherfolk access to modern agricultural and fishery inputs developed through research and development.

Complementing this strategy are efforts to promote rural industrialization, particularly by putting up viable enterprises, and accelerate the development of infrastructure facilities like irrigation and farm-to-market roads.

Under the strategy for Asset Distribution Reform, the government pledges to continue the land reform process, along with the provision of support services for agrarian reform beneficiaries (ARBs). Meanwhile, as agriculture is being modernized, the government promises to ensure that intensified production activities would not undermine the integrity of the environment. Hence, it espouses policies that promote environment friendly technologies and sustainable farming practices.

Notwithstanding her government's formal declarations, this paper would argue that a number of specific policies and strategies endorsed by the Arroyo administration are advertently or inadvertently undermining its avowed goals. While some of these policies and strategies may have preceded the current government, it has nonetheless done its share to exacerbate their effects on Philippine agriculture.

What Ails Philippine Agriculture?

A Case of Opening Up Too Much, Too Soon

The Magna Carta for Small Farmers prohibits the importation of agricultural products except where there is a shortage and only in volumes that approximate the expected shortfall. This prohibition was intended to protect domestic farm products from cheap, highly subsidized imports.

However, in 1994, the Philippines abandoned this policy when it ratified the General Agreement on Tariffs and Trade (GATT), including the Agreement on Agriculture, which mandates the opening up of the country's market to imports.

Ten years after, the impact of this policy is evident in the following trends in the performance of the country's agriculture sector. Data from the Bureau of Agricultural Trade Statistics (BAS) show that aggregate agricultural imports rose from US$1.3 billion in 1993, a year prior to GATT ratification, to US$2.1 billion in 2001.

In the same period, total agricultural exports declined, from US$1.9 billion to US$1.2 billion. Meanwhile, in contrast to optimistic forecasts by the Department of Agriculture (DA), the country's agricultural trade deficit ballooned by as much as 265 percent in 1996, and by 427 percent in 1997. Gross value added in agriculture (GVA) was virtually at a stand-

still, growing from PhP171 billion in 1995 to a mere PhP183 billion in 1999.

Rural employment in agriculture proved just as disappointing: from 11.14 million in 1993, it dropped to 10.8 million in 2001. It will be recalled that pro-liberalization economists had projected the creation of at least 500,000 new jobs in agriculture every year as a result of increased export trade.

The following section discusses in greater detail the effects of trade liberalization on three sub-sectors of agriculture: rice, livestock and poultry and vegetables and fruits.

Removal of Quantitative Restrictions on Rice Imports and Tariffication of Rice

In compliance with the country's GATT-WTO commitments, the Philippine Congress passed Republic Act (RA) 8178, or the Agriculture Tariffication Act, in 1994. This law, which replaces quantitative restrictions (QRs) on agricultural products with tariffs, went into effect immediately, except in the case of rice, where tariffication was deferred for 10 years.[2]

The 10-year deferment expired in December 2004, after which in lieu of a QR a proposed 100 percent tariff would be slapped on rice imports.

At this tariff level, the price of imported rice would approximate the price of domestically produced rice. As such, the tariff rate would not benefit consumers. Nor would it provide any real protection to local rice farmers because it is still more cost-effective, not-to-mention more convenient, to deal with a single source abroad rather than to build stocks from many small suppliers and farmers.

Farmers groups are protesting the cancellation of the rice QR, saying that tariffs are bound to be progressively scaled down and so offer little in the way of future protection for local producers. In fact, there are already talks within the DA of slashing the proposed tariff rate by half. At this level, tariffs would provide virtually no protection to local producers: at PhP 11.00–PhP 12.00 a kilo the maximum landed value of imported rice would still be lower than the selling price of domestically produced rice (PhP 14.00 a kilo).

The country's inability to compete on price is not the only argument presented by farmers groups against rice tariffication.

Just as importantly, the decision to import, including the volume of rice to be sourced from abroad, would henceforth be triggered mainly by price differentials in the market rather than by projected shortfalls in production.

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2 Annex 5 of the WTO Agreement allows a member country to suspend the tariffication of QRs of a politically sensitive staple food.

Traders would be free to import whatever volume suited them, based on their reading of price signals, and regardless of the availability of local supply.

Needless to say, this situation would undermine the economic viability of rice producers and would have knock-on effects on the agriculture sector in general.

Rice is still the Philippines' most important agricultural product. Palay production alone accounts for 19 percent of the country's total agricultural output and 2.9 percent of the Gross Domestic Product (GDP). Around two million farmers are directly employed by this sub-sector. Hence, any policy that undermines the rice industry poses a threat to a significant and major component of the country's agriculture sector.

The Beleaguered Livestock and Poultry Industries

The livestock sub-sector is one of the largest in Philippine agriculture, accounting for as much as 14 percent of agricultural production. In 1999, it contributed just over PhP 68 billion in GVA. Production in the sub-sector was valued at PhP94 billion in the same year *(BAS, 2000)*.

Table 32. **Hog Inventory *(1990–2001)***
(in thousand heads, January 1 of each year)

Year	Backyard	Commercial	Total
1990	6,776	1,224	8,000
1991	6,621	1,458	8,079
1992	6,717	1,305	8,022
1993	6,663	1,290	7,953
1994	6,766	1,460	8,226
1995	7,181	1,760	8,941
1996	7,239	1,787	9,026
1997	7,788	1,964	9,752
1998	8,031	2,180	10,211
1999	8,179	2,218	10,397
2000	8,327	2,383	10,710
2001 (p)	8,542	2,521	11,063

p — preliminary
Source: ***Bureau of Agricultural Statistics***

Table 33. **Growth Rates in Livestock and Poultry *(percent)***

	1996	1997	1998	1999	2000
Livestock	6.60	5.34	3.37	4.50	3.07
Poultry	11.27	6.84	0.64	0.96	5.39

Data from: ***BAS***

Hogs make up about three-quarters of Philippine livestock production and accounted for PhP 74.7 billion of the value of production in 1999.

The poultry sub-sector accounts for another 14 percent of agricultural production. It contributed around PhP41 billion in GVA in 1999. The value of poultry production in that year was PhP 66 billion at 2000 prices, with chicken accounting for PhP 49.7 billion, or about 75 percent. *(BAS, 2000)*

However, since the country ratified the GATT in 1994, imports of cheap meat and meat products have risen steadily, amid howls of protest from local livestock and poultry producers.

Indeed, data from the Bureau of Agricultural Statistics (BAS) reveals that growth has slowed in both sub-sectors in recent years.

Growth in the livestock sub-sector took a nose-dive following trade liberalization: from 6.60 percent in 1996 to 3.07 percent in 2000. The poultry sub-sector in particular endured similar reverses: growth was almost halved to 5.39 percent in 2000 after first plummeting to 0.64 in 1998 *(See Table 31).*

In the four years prior to the country's accession to the WTO, (i.e., from 1990 to 1994), hog imports grew at no more than - 7.0 percent on average. Right after accession, or between 1995 and 2000, this shot up to a dizzying 134percent. In particular, carcass imports increased from just 38 tons in 1997 to 533 tons in 2000 *(See Table 32)*.

Pork imports went up further in later years, following the lifting of import restrictions. In 2001, the tariff on pork products was 30 percent at in-quota volume and 60 percent at out-quota volume,,down from 30 percent and 100 percent, respectively, in 1995. In 2004, tariffs are expected to converge at 30 percent.

Likewise, frozen chicken imports skyrocketed after the lifting of quantitative restrictions: from less than a thousand tons in 1995 to 15,000 tons in 2001.

In 1999, imports peaked at 29,000 tons due to the massive entry of imported leg quarters from the United States *(See Table 33).*

Based on current figures, chicken imports account for 3 percent of domestic demand. However, this estimate is likely to be understated as it takes account only whole chicken imports. Chicken parts, especially leg quarters, sell for just a fraction of the cost of a whole chicken because these are not prized as highly in the U.S. market as

Table 34. **Pork Importation *(1991–2002, MT/$)***

Year	Carcass		Processed		Offals		Total	
	Vol.(MT)	Val.($)	Vol.(MT)	Val.($)	Vol.(MT)	Val.($)	Vol.(MT)	Val.($)
Total	**66,036**	**76,222,790**	**34,901**	**49,595,910**	**100,937**	**124,818,700**	**201,874**	**250,637,400**
1991	462	386,578	4	27,625	466	414,203	932	828,406
1992	417	356,275	140	30,456	557	386,731	1,114	773,462
1993	39	22,185	27	43,897	66	66,082	132	132,164
1994	238	216,229	94	320,861	332	537,090	664	1,074,180
1995	693	693,114	60	300,426	753	993,540	1,506	1,987,080
1996	4,285	6,724,723	834	1,271,260	5,119	7,995,983	10,238	15,991,966
1997	7,037	13,372,833	3,976	6,804,474	11,013	19,177,307	22,026	39,354,614
1998	6,904	8,215,629	3,614	6,107,509	10,518	14,323,138	21,036	28,646,276
1999	18,122	19,314,560	8,735	12,827,993	26,857	32,142,553	53,714	64,285,106
2000	15,785	15,773,591	5,830	5,771,108	21,615	21,544,699	43,230	43,089,398
2001	9,822	9,090,471	8,250	11,349,088	18,072	20,439,559	36,144	40,879,118
2002*	2,232	2,056,602	3,337	4,741,213	5,569	6,797,815	11,138	13,595,630

**** as of April 2002***
Source: ***Bureau of Agricultural Statistics***

chicken breast. Hence, imports of chicken parts land in the Philippines, tariffs included, at a bargain.

Competitiveness is a major issue for the country's local producers. Local hog production, for example is not competitive with imports. One of the main reasons for this is that the local feed conversion ratio (FCR), or the amount of feeds needed to produce a kilo of live hog, is higher than that of foreign hog raisers.

The local FCR is at 3.6 kg. or more, while foreign hog raisers have maintained their FCR at 3 kg. The 600 gram difference is equivalent to about 54 kg of additional feed per hog. Furthermore, the average litter size is also lower than in the advanced countries.

Another serious problem is that the cost of corn, the main component in livestock and poultry feeds, is relatively expensive and often scarce in major production areas. The prices of other feed components, such as soya and wheat, are also on the rise.

In the case of chicken, corn comprises 70 percent of feed cost which in turn comprises 60 percent of the cost of chicken. There is also a dearth of quality slaughterhouses, storage, and transport facilities, which can reduce costs and are necessary for the growth of the industry.

The Unhealthy State of the Vegetable and Fruit Industries

Following the cancellation of import restrictions, the Philippines pegged the tariffs at 40 percent. However, the actual applied rate for most vegetables (except cabbage and onion) is much lower (7 percent). This is by virtue of Executive Order No. 164, which was issued by President Gloria Macapagal-Arroyo in January 2003.

This has resulted in the entry of cheap vegetable imports which now threaten to supplant the entire vegetable market in the Philippines.

Resolution No. 570 of the House of Representatives (12th Congress, 14 January 2003) expressed concern that "the removal of quantitative restrictions and the more than halving of average nominal tariffs in the

Table 35. **Frozen Chicken Importation *(1990–2001)***

Year	Volume*(tons)*	Value*(US$'000CIF)*	Volume Growth*(%)*	Value Growth*(%)*
1990	184	700		
1991	30	90	(83.9)	(87.1)
1992	8	27	(73.5)	(70.0)
1993	106	398	1,255.9	1,366.6
1994	198	1,367	86.5	243.6
1995	181	1,532	(8.4)	12.0
1996	199	405	9.9	(73.5)
1997	962	1,257	384.0	210.2
1998	2,417	2,738	151.1	117.8
1999	29,316	23,121	1,112.9	744.5
2000	16,529	19,748	(43.6)	(14.6)
2001	10,830	7,595	(34.5)	(61.5)

Note: ***2000 imports were highly understated. The USDA figures estimated about 24,000 tons.***
Source: ***National Statistics Office***

sector especially since the mid-1990s. . . has caused imported vegetables to flood the domestic market with an almost three-fold increase from 42,000 metric tons (MT) in 1995 to 115,000 MT in 2000, not even counting thousands of metric tons which were smuggled into the country as a result of the more liberal import policies."

Farmers in Benguet province, the country's prime vegetable production area, as well as in other parts of the country have sustained huge losses as a result. For instance, Benguet Governor Raul Molintas reported that vegetable importation is costing farmers, booth holders and traders some PhP 3.5 million a month in La Trinidad alone. Other reports have estimated the loss in income due to vegetable smuggling at an average of PhP 25 million a week.

At the current rate of importation,, the local industry is forecast to lose more than a billion pesos a year and thousands of farmers' families in Benguet and Mt. Province, Pangasinan and other vegetable-producing provinces in the country would be displaced.

Government Capitulation

Like the now discredited structural adjustment programmes (SAPs) imposed by the IMF and the World Bank on debtor countries, the WTO Agreement on Agriculture is forcing the pace of liberalization of agricultural trade in a manner that erodes the right of governments and communities to determine the appropriate balance between liberalization and protectionism. Such "liberalization under pressure" has not only adversely affected the development of Philippine agriculture sub-sectors in the short- to medium-term, but threatens their very survival along with the small farmers that depend on them for their livelihood.

At the Asia-Pacific Economic Summit (APEC) Summit in Mexico last October 2002, President Arroyo decried the unfair trade rules of the WTO. Following the collapse of talks at the WTO Ministerial Meeting in Cancun in September 2003, both the Department of Agriculture and the Department of Trade and Industry announced that the Philippine government would oppose any further opening up of the country's markets.

When it came down to it, however, the Arroyo government could not be counted on to put its money where its mouth was.

On January 9, 2004, President Arroyo signed Executive Order 268, which reduces tariff rates on all agricultural and industrial products under the ASEAN Free Trade (AFTA) Common Effective Preferential Tariff (CEPT) Scheme. Farmer groups complained that even among its ASEAN partners, the Philippines is ill-prepared for competition. For example, the country's sugar yield of 4.93 MT trails both Indonesia's and Thailand's at 5.76 and 6.71 MT, respectively. They added that by going full-blast in opening the country's markets via regional agreements like the AFTA-CEPT, the Philippines is squandering the gains it had made in Cancun.

Another example of the Arroyo government's flip-flopping on agricultural trade liberalization is its declared intention, on the one hand, to negotiate for an extension of the country's rice QR, and the announcement by its top agriculture trade negotiator, Assistant Secretary for Policy and Planning

Segfredo Serrano, that the government is considering the inclusion of rice in a proposed Special Products (SP) list in the WTO. This could seriously weaken the country's bargaining position because it sends the signal that the Philippines might be persuaded to give up its QR in exchange for the protection offered under an SP mechanism. SPs do not provide the same level of protection as QRs because they do not give government the flexibility to stop importation altogether where the supply is enough to meet local demand.

Vacillating on Asset Reform

President Arroyo has singled out asset reform as her administration's main economic development strategy and pledged to complete land distribution by 2008. However, her government's recent actions and policies fell short of its rhetoric.

In March 2004, for instance, the government came under fire when it became known that it had not made any budget allocations for agrarian reform implementation. Apparently, it intended to take the entire budget for CARP out of the Agrarian Reform Fund (ARF), which is intended to fast-track the land acquisition and distribution (LAD) process and which includes the recovered PhP38 billion ill-gotten wealth of the Marcoses.

By law, 70 percent of the ARF should go towards LAD, while 30 percent should be devoted to support services delivery.

The ARF is not meant to pay the salaries of DAR personnel or to be used for any other purpose. Unless the government stops raiding the ARF and restores the mandatory allocations for CARP, it will virtually ensure the failure of its land redistribution efforts.

Another indication of the government's less-than-steadfast commitment to the agrarian reform effort is the recent request (July 2004) by the DAR, through its OIC-Secretary Jose Mari Ponce, to postpone the installation of ARBs by as much as two years. Sec. 24 (Award to Beneficiaries) of Republic Act 6657 or the Comprehensive Agrarian Reform Law provides that the rights and responsibilities of the beneficiary shall commence from the time the DAR makes an award to her/him, and the award should be completed within 180 days from the time the DAR takes possession of the land. The request for a two-year extension is not only illegal but, if allowed, would give landlords more opportunity to obstruct the already flawed process of land distribution.

The Farmland as Collateral Bill (Senate Bill No. 2553) seeks to collateralize the Certificate of Landownership Award (CLOA) and emancipation patents (EPs) for the avowed purpose of providing access to credit to ARBs. President Arroyo included the passage of such a law among her administration's Specific Anti-Poverty Measures for this ostensible reason. However, this bill also seeks to lift the CARL's five-hectare retention limit (Sec. 6) and the 10-year prohibition on the transfer (*i.e.,* sale, mortgage, transfer, usufruct) of CARP lands (Sec. 27).

In effect, any person may buy or reacquire lands that have been redistributed by virtue of CARP. Farmers groups anticipate that the bill, if enacted, would lead to massive foreclosures of EPs and CLOAs and the

reconsolidation of agricultural lands in the hands of a few.

That President Arroyo is especially keen to see this bill pass casts serious doubt on the depth of her commitment to asset reform.

Modernizing Agriculture to Extinction

Like other governments in Southeast Asia, the government of President Arroyo is preoccupied with enhancing agricultural productivity, especially of rice. To meet the demand for this staple food in the next few decades, experts have estimated that the yield ceiling of irrigated rice will need to increase from its late 1980s level of about 10 tons a hectare to around 13 tons a hectare, while average yields will need to reach about 6 tons a hectare, nearly twice the current level. And this will have to be achieved using less land, less water, less labor, and fewer chemical inputs, particularly pesticides.

Green Revolution technologies are now considered "almost exhausted" of any further productivity gains. In fact, yearly production increases have slipped to around 1.25 percent since 1990.

Productivity declines are especially noticeable in an increasing number of favorable rice-growing areas due to long-term degradation of the paddy resource base.

Even experimental plots at the International Rice Research Institute (IRRI) are giving significantly lower yields today than in the early 1970s.

Furthermore, soil salinization, waterlogging and other degradation associated with intensive rice cropping will lead to a net drop in Asia's total irrigated area.

Land suitable for further expansion of rice is also disappearing, due in part to water and wind erosion and chemical and physical abuse. The quantity and quality of water available for rice growing is also expected to decline.

As a result, rice farmers face declining profit margins. Since the beginning of the 1990s, a stagnant yield frontier and diminishing returns to further intensification have pushed up production costs.

Other changes in factor markets—rapid withdrawal of labor from the farming sector, diversion of land for other agricultural and non-agricultural purposes, increased competition for water, and withdrawal of input subsidies—are driving up input prices and will only intensify in future.

Unfortunately, the failure of Green Revolution technologies to live up to their promise of eliminating food shortages, not to mention their social and environmental cost, have not disabused governments in the region of their preference for high-tech solutions. This time they have latched on "hybrid rice" or "super rice" developed in China, whose yields are touted to be 20 percent higher than those of conventional High-Yielding Varieties (HYVs).

The Philippines' Department of Agriculture (DA) had targeted to increase hybrid rice production to 200,000 hectares by the end of 2003. However, as it turned out, not even

half this area is currently planted with hybrid rice. The poor uptake was attributed to a shortage of hybrid rice seed.

Consequently, the Bureau of Plant Industry (BPI) is thinking of adopting varieties developed by Syngenta, the Swiss multinational agribusiness giant that is attempting to establish monopoly control of the rice crop.

Syngenta has sequenced more than 99.5 percent of the rice genome, beating Monsanto to the punch. It thereafter declared that it would restrict access to the genome map and expects proprietary control over any research carried out using this information. While the company said that it would not seek to patent the entire genome, it admitted it would try to get patents on individual genes. The implications of Syngenta's current and potential claims on rice genes are so far-reaching that critics have jokingly suggested that rice should henceforth be called Oryza Syngenta.

Equally worrying is the precedent set by the DA, when it approved in December 2002 the commercial propagation of Monsanto's Bacillus thuringensis (Bt) corn variety called YieldGard Corn Borer. Bt corn is a corn variety developed through genetic modification to resist the Asiatic corn borer, a major cause of declining corn yields.

Data from China show that the use of Bt crops can exacerbate populations of secondary pests. Long-term soil health may also be affected since the Bt gene stays with the soil even after harvest, and thus may impact on other microorganisms present in the soil and disturb the process of decomposition. But aside from effects on the soil and other microorganisms, Bt corn's target insects may develop a resistance to the Bt gene, making the variety's ability to resist the insect ineffective over time. This would almost certainly lead to the application of new and even more toxic chemical pesticides.

Adopting the technology may also lead to socio-economic problems. The non-government organization Southeast Asia Research Institute for Community Education (SEARICE) noted that in the US, where Monsanto has commercialized a number of GM crops such as soybeans, corn and cotton, farmers have been sued over violations of patent rights. Monsanto asks US farmers to sign a contract upon the purchase of their GM seeds. The agreement states that Monsanto is not selling the seeds but is merely leasing these to farmers based on the following conditions:

- Farmers are not allowed to replant the offspring produced from the seeds;
- Farmers are prohibited from exchanging or giving seeds to other farmers; and

- Monsanto will be allowed to monitor the field of farmers at anytime within three years from the time of purchase.

Since Monsanto owns the patent rights over the GM seeds, it has complete control the product and the processes involved in its propagation. SEARICE said farmers may lose the market for their corn products in the same manner that US farmers experienced losses when their GM crop exports were barred from entering countries that have stringent rules on the usage and adoption of GM crops.

Further, that producing bumper corn may also result in lower prices and losses for the farmers who may have to pay a premium for the Bt seeds.

On April 22, 2003, farmers and environmental groups staged a hunger strike to demand a moratorium on Bt corn commercialization. On May 14, 2003, the Department of Agriculture (DA) thumbed down their petition, citing lack of "compelling evidence" in support of it.

Monsanto's patent for an herbicide called Glifocate, which goes by the brand name 'Round-up', expired in 2000. 'Round-up' accounts for a major portion of Monsanto's income. In its despair to stay afloat, Monsanto is turning to GMOs (genetically-modified organisms) as a new source of income. Indeed, there is a gold mine in GMOs more than in the pioneer chemicals it has produced in the past. Once Monsanto is able to propagate its Bt corn, it would be the exclusive monopolistic source of Bt seedlings. And if all corn farmers were to buy Bt corn seedlings from Monsanto, it will more than make up for Monsanto's losses on expired chemical patents. The windfall is projected to be so huge, Monsanto will do anything to control the GMO market.

Another argument leveled against Bt corn is that its effects are IRREVERSIBLE. Once a field is planted with Bt corn, its pollen would infect every other corn crop in other fields. If evidence of Bt corn's side effects were later to emerge, the damage could no longer be corrected. Modifications on the corn crop cannot be undone at the gene level. By acceding to Monsanto's designs, the Philippine government has wittingly or unwittingly played right into the hands of this monopolistic agribusiness giant.

Sustainable Agriculture in the Philippines

Background

The concept of sustainable agriculture first came to light in the Philippines with the publication in 1980 of a report called "Profits from Poison". This report, prepared by the Farmers Assistance Board, a non-government organization (NGO) working in rural development, cited the negative impact of chemical agriculture on rice farmers. Another study, this time by the Agency for Community Education and Services (ACES), confirmed the findings of the earlier report, and showed moreover that rice farmers were economically better-off before their adoption of Green Revolution technologies. This study was eventually published in the mid-1980s as a small book called "The Miracle That Never Was".

The ACES findings were presented at the National Convention of Rice Farmers held

at the University of the Philippines Los Baños in July 1985. Soon after, the very first protest rally of rice farmers against the International Rice Research Institute (IRRI) was witnessed. Another offshoot of the Farmers Convention was the creation of an NGO called Farmer-Scientist Partnership for Development, Inc. In May 1986 this new organization launched its first project called MASIPAG (*Magsasaka at Siyentipiko para sa Ikauunlad ng Agham Pang-Agrikultura*). The MASIPAG project focused on rice breeding, allowing farmers to select the parent materials, based on desired plant characters, and to perform rice breeding (after intensive training). In the process of selecting progenies from varietal crosses, the farmers made it a policy to use no synthetic fertilizers or pesticides in the trial farms.

MASIPAG started with one trial farm in Nueva Ecija in 1986; it now has 219 such farms in Luzon, Visayas, and Mindanao, all being maintained by people's organizations (POs). Towards the late 1980s, other initiatives sprung up, including the biodynamic farming of the Centre for Alternative Development Initiatives (CADI); the International Institute for Rural Reconstruction (IIRR)'s biointensive gardening; and organic farms by the Organic Farming Field Experimental and Research Station.

In 1990, 15 Philippine NGOs formed the Sustainable Agriculture Coalition (SAC). Their initial activity was to each hold SA fairs in different parts of the country. Soon after, the Philippine Forum for Sustainable Agriculture was put together in 1991 by four NGOs primarily to exchange experience among themselves and with their partners. Awareness of SA spread further among NGOs with the holding of the highly publicized 1992 Earth Summit, at which SA-related concerns were given some prominence.

Xavier University in Cagayan de Oro established its Sustainable Agriculture Centre (SAC) in 1992. PAKISAMA, a national federation of peasant organizations, implemented its SA project in seven provinces.

SA also drew the interest and a certain degree of support from the government. For instance, the Department of Agriculture (DA), complying with the government's Agenda 21 commitments, started an integrated pest management (IPM) program. The College of Agriculture at the University of the Philippines Los Baños began to reorient its agriculture curricula towards SA by including courses on farming systems and ecological agriculture.

Meanwhile, some NGOs were hard at work trying to clarify what they meant by Low External Input Sustainable Agriculture (LEISA).

An NGO called AGTALON, based in Pangasinan (Luzon), defined LEISA for rice production as applying at least 10 bags of organic fertilizer plus a maximum of two bags of synthetic fertilizer (instead of 8-10 bags in the conventional system) and no pesticides at all.

Others qualified it as applying synthetic inputs at below recommended levels (for conventional agriculture). This continued dependence on agrochemicals put the LEISA adoptors in conflict with organic growers, who claimed that their products were superior to those of SA farmers.

In 1996, Filipino members of IFOAM, who had attended the 1995 IFOAM Asia Conference in Seoul, formed a coalition called FOODWEB for the express purpose of coming up with a set of Philippine Standards for Organic Production and Processing based on IFOAM Standards.

The Organic Producers and Traders Association (OPTA), formed in 1995, teamed up with FOODWEB for this task. Armed with a draft standards document, the FOODWEB group was joined by key staff of the Natural Products Division of the Centre for International Trade and Exposition Missions (CITEM) and together they formed the Organic Industry Technical Working Group.

At this time, too, the DA launched its "balanced fertilization program," which combines organic and inorganic fertilizers for rice production and which represents the government's idea of LEISA.

In the meantime, NGOs continued to churn out materials on SA, such as *Routing Sustainable Agriculture* by M. Viado *(1997)* and *Ecological Farming: Principles, Techniques That Work and Farmer Innovators in the Philippines* by H. Padilla *(1999).*

In June 2001, the Organic Industry Technical Working Group held a National Organic Congress. Besides raising awareness for organic farming among government officials and the general public, this meeting produced a sectoral consensus on action plans, as well as gave birth to the Organic Certification Centre of the Philippines (OCCP).

PO and NGO advocates of SA and organic agriculture (OA) demanded support from the government at the Agriculture and Fisheries Stakeholders Summit in May 2001. As a result, then DA Secretary Leonardo Montemayor issued an order creating a national task force for OA.

While the foregoing events bode well for the SA/OA movement, a number challenges remain in regard to the development of this farming system in the Philippines.

Coverage of Sustainable Agriculture

The coverage of SA in the country includes areas that are traditionally organic and those that have been converted from chemical farming. Traditionally organic areas refer to production areas which have remained largely free of synthetic inputs despite the Green Revolution. The most extensive of these are coconut farms.

Of the more than three million hectares planted to coconut, just 20 percent are treated with chemicals, and these only indirectly, because the chemicals are really intended for the crops intercropped with coconut.

Next to coconut, banana and coffee that are grown as backyard crops do not need chemicals. Neither does a great variety of fruit trees, cultivated on a small scale.

Estimates of areas under traditionally organic production are: 2.747 million hectares for coconut, 0.130 million hectares for banana, and 0.041 million hectares for coffee. Thus, organic coconut makes up 28 percent of the country's total agricultural area; while altogether, organic coconut, banana and coffee constitute about 30 percent.

Meanwhile, areas converted into organic production are mostly LEISA farms. According to the most recent estimates, such farms cover less than 100 hectares.

Rice

Three of the biggest groups involved in organic rice production (MASIPAG, Xavier University's SAC, and PAKISAMA) reported a total (i.e., combined) organic rice area of 2,675 hectares among direct members.

Assuming that there is at least a 10 percent simultaneous infusion to non-members, then the total area could be about 3,000 hectares. Assuming further that all the other small groups have a similar coverage of 3,000 hectares, then there is an overall total of 6,000 hectares under organic rice production, or a mere 0.2 percent of the total paddy rice area. Table 35 summarizes the total number of households and farm areas adopting LEISA and OA (as reported in February 2001 by the three groups).

Other Crops

The production area for organic sugar cane, banana, and vegetables is estimated at 0.1 percent of the total area planted to each of these crops.

Yield from Organic Production

PAKISAMA has reported the following average yields from organic rice (1996–1999):

- Luzon 3,350 kg/ha
- Visayas 2,974 kg/ha

Table 36. **Extent of OA and LEISA Adopters from Three Related Programs**

Group	Years Covered	Organic Agriculture		LEISA	
		Household*(no.)*	Area*(ha)*	Household*(no.)*	Area*(ha)*
MASIPAG	1990–2000	1,897	1,754	11,052	10,468
PAKISAMA	1997–2000	1,297	671		
SAC of Xavier University	1997–2000	229	250	120	153

- Mindanao 3,250 kg/ha
- Average 3,191 kg/ha/season

Meanwhile, MASIPAG organic farmers in Surigao del Sur have reported an overall average of 3,191 kg/ha/season for organic rice. This is only slightly less than the country's average of 3,350 kg/ha for irrigated rice under conventional or high-external-input farming.

The average organic rice yield by SAC was 3,440 kg/ha which is about 1,000 kg/ha less than the average of 4,400 kg/ha from conventional farms in the vicinity; however, the return on investment (ROI) from organic rice was 2.37, compared to 1.10 from conventional rice. In this instance, the ROI was based on the cash cost of production only; if both cash + non-cash costs were taken into account, the production cost would exceed the net profit from the conventional production system.

In the MASIPAG site in Surigao del Sur, an income analysis of the 30 organic farms gave an average ROI of 2.15.

Constraints to Conversion

Insecure Land Tenure

By far, the biggest constraint to conversion to organic production in the Philippines is the lack of land tenure security. Experience has shown that the best-managed organic farms are those that are owned by the cultivators themselves. Alternatively, some wealthy land developers have successfully put lands under organic production of vegetables and herbs using farm managers and workers. Tenants, lessees, and renters can hardly be expected to show any interest in converting to organic production unless the landowners themselves are determined to convert their lands and to pay for the cost of conversion.

Lack of Support Services for Organic Production for "New Landowners"

Agrarian reform beneficiaries (ARBs) are potential and strategic adoptors of organic farming. However, they must be given technical and production support for organic production, storage and processing, as well as assistance in certifying and marketing their products as organic.

Lack of Accredited Organic Certification and Instability of the Organic Market

Inadequate Education and Training

Farmers, especially those in marginal areas, need to be helped to appreciate the benefits of going into organic farming. Current education and training programs are limited to POs/NGOs and church-based organizations that already have OA and SA programs.

Lack of Financing

There is no proactive financing program for organic farming. On the other hand, studies have shown that successful organic farmers had access to financial support.

Unreliability of Organic Input Supply

Conversion is constrained by the lack of organic seeds, certified organic fertilizers and for the livestock industry, certified organic feeds.

Government Support for Sustainable Agriculture

Research and Development, Education and Extension

In the last few years, certain units in some government agencies have begun to show an interest in SA, or more specifically,OA. In 1997, the Philippines Council for Agriculture, Forestry, Fisheries and Natural Resources Research and Development (PCARRD) sponsored a national consultation workshop on OA at which representatives of organic producers and members of IFOAM were given the chance to interact with government researchers.

In 1998, PCARRD funded case studies of selected farms (organic, LEISA and conventional) which showed, among others, that the organic farm that used on-farm biomass gave a higher return on investment values than the LEISA and conventional farms.

In 1999, PCARRD and the Bureau of Agricultural Research of the DA funded a five-year R&D program, "Organic Vegetable Production," to be implemented by the University of the Philippines Los Baños Institute of Plant Breeding. Sometime after, PCARRD conducted a workshop-consultation on organic livestock production, focusing on organic chicken. The workshop was supposed to encourage support for organic chicken breeding and production by the Institute of Animal Science at the University of the Philippines Los Baños.

Another government initiative was a regionwide (Northern Luzon) organic production project by the Benguet State University, whose vice-president is an individual member of OCCP.

Characteristics of farmer-adoptors

Most Filipino farmers engaged in organic production are members of POs/NGOs or PO/church-based organization partners. Some of the POs have their own cooperatives, which are generally multi-purpose cooperatives and less frequently, women's organizations. A small percentage of the organic farmers are not members of any organization. Even fewer are adoptors involved in contract farming.

Marketing

The Agricultural Marketing and Support Services of the DA has offered groups of organic producers the free use of some space near the DA for the marketing of their products.

Regulatory Framework for Sustainable Agriculture

A document containing organic certification standards adopted from the IFOAM Basic Standards was prepared by FOODWEB in the mid-1990s, and refined in a series of regional consultations/workshops held in Luzon, Visayas and Mindanao. In the middle of year 2000, at a national workshop, the document was adopted as the Standards for the organic industry.

Soon after, the Organic Industry Technical Working Group made preparations for an orientation training in organic certification and inspection. In December 2000, selected members from the organic movement were trained by Swiss consultants. Based on this training and reference materials from various countries, a "Manual of Operations for Organic Certification" was drafted, along with an "Inspectors Manual". The Standards document adopted at the 2000 workshop was also scrutinized by a Swiss consultant to ensure consistency with international norms.

On the basis of these three documents, the Organic Certification Centre of the Philippines (OCCP) was officially launched on June 22, 2001. On the same occasion, the OCCP held its first General Assembly and elected its Board of Trustees from among representatives of member organizations. OCCP members consist of farmers' organizations and federations, NGOs, the private sector and individuals from some government agencies (CITEM, DA, and Philippine Coconut Authority) and the academe.

At the same time, an NGO, the Alliance of Volunteers for Development Foundation (AVDF), has also set up a certifying body, called "Philippine Organic Guarantee Incorporated" (POGI), which purportedly counts POs of indigenous peoples as members and conforms to IFOAM standards.

Meanwhile, the unaffiliated exporters of organic products have their products certified by foreign agencies.

Market for Organic Products

The global market for organic foods and beverages is worth some US$20 billion (2001). This figure is small compared to total food sales but the market for organic food is growing fast (as of 1998): by 20-30 percent in the United States and Switzerland; 30-40 percent Denmark and Sweden; 25-35 percent in the United Kingdom and Northern Ireland; and 20 percent in France and Italy. Such figures are not available for Asian countries; however, Japan accounted for US$1 billion sales in 1998, or one-fifth that of the US, and one-sixth that of the whole of Europe. Japan is clearly the largest market for organic food in Asia.

There are no comparable figures for the domestic market however. It may be indicative though that three NGOs providing marketing assistance to their farmer-members were able to market a total 70,814 cavans of their produce to a local vegetable trading centre in Benguet province.

Major Marketing Channels

Organic producers in Luzon, Visayas, and Mindanao market their produce under their own labels. In vegetable-growing areas in

Northern Luzon, some NGOs purchase organic products from farmers (with little vegetable plots) and sell these at urban centres. In places where there are POs of organic rice farmers, market outlets for organic rice are few, if any. In some cases, the NGO partners take on the task of marketing the rice, but these are the exception.

Organic vegetable growers had been selling their produce haphazardly until OPTA set up special outlets in Manila for organic vegetables, and thereby distinguished these from conventional farm produce.

Meanwhile, organic food exports are handled by only a few groups. One of these, Altertrade, is a private corporation based in Bacolod City in the Visayas that supports small and marginalized farmers. An IFOAM member, Altertrade is the only Philippine company with international organic certification to export organic sugar (*muscovado*) and table banana. Altertrade buys organic banana from small growers in Negros and Bicol and exports these to Japan. It also exports organic banana chips to Canada in partnership with the Organic Verification of North America based in Winnipeg, Manitoba.

Altertrade is itself a producer of *muscovado* (sugar produced by heating sugar cane juice in open pans) and regularly exports this product to Europe and Japan.

Pricing Sustainable Agriculture Products

The price differential between organic and conventional products is determined primarily by quality and the target market. For instance, prices for organic fancy rice (red rice, black rice, aromatic rice), patronized by the high-income class, can go up to 100 percent more than ordinary conventional rice, which has no equivalent fancy varieties. For the middle-income class, a slightly higher price (10-15 percent more) is tolerable. Once the products have been certified as organic, prices are expected to go up even higher.

Post-harvest Handling

There is no major post-harvest facility for handling organic products.
Each trading group handles only such volumes as they can manage.

Success Stories in Income Generation and Employment

At the household level, a selected success story is the one-half hectare irrigated organic rice farm within which diversified economic activities gave much higher income than the main rice crop. Net income from its various components within the six-month period of the case study gave a monthly income of more than PhP 20,000, which reached the income level of an assistant professor of a local state college in the area. Other success stories, but no income measurements, are given in the book, Ecological Farming *(Padilla 1999).*

With respect to organic enterprises beyond household employment, a success story is the A.P. Inocencio Teresa Farms which produces organic chicken. As mentioned previously, the farm meets all the requirements

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of an organic production system except for the corn and legume grain ingredients in the feed formulation which do not come from organic sources. The Inocencio Farm used to be a large-scale conventional poultry farm (100,000 heads) which was converted into an initially small-scale organic poultry farm. Since Inocencio is pioneering the organic system, he was not inclined to go into rapid expansion.

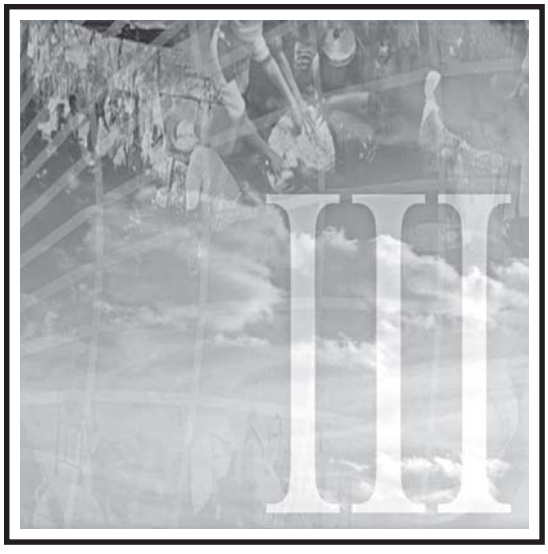
Instead he is establishing satellite farms in different parts of the country. This is also part of his experimental approach to determine the local adaptability and meat quality of the Sasso breeds, some of which have been cross-bred with native roosters.

The success story of the Inocencio Farm relates to the success of his shift from conventional into organic production in spite of the fact that there has been no official R and D programme as a source of local technologies for organic poultry production. In the process, Inocencio developed an attitude of greater commitment to social and ecological values rather than purely economic, as was the case of his previous conventional farm.

— From the paper of Dr Angelina Briones, Professor of Soil Science, University of the Philippines at Los Banos, Laguna, Philippines.

chapter

III



Khamkalan and Parmalpur

Kaimur, Bihar, India

Project Site Profile

Prepared by: Association of Voluntary Agencies for Rural Development (AVARD)
Edited by: Teresa Lingan–Debuque

The project site in North India consists of two small villages in Bihar: Khamkalan and Parmalpur.

Agriculture is the major source of income in both villages. Khamkalan households get 71 percent of their income from farming, and the rest from non-farm activities. In Parmalpur, households appear to have more alternate sources of income, although over half of their income comes from agriculture-related activities.

The average annual income a household in Khamkalan is Rs. 19,239 (US$458), or US$1.25 a day. In Parmalpur, both farm and non-farm activities yield better returns than in Khamkalan; the average annual household income there is almost three times higher: Rs.57,446 (US$1,367). Nonetheless, this income level is still considered quite low for a six- to eight-member household—the average household size in Khamkalan.

Agricultural Practice

Khamkalan has a rainfed agriculture system. *Kharif* (autumnal) crops are primarily grown with rainwater, but in the latter stages of cropping, some farmers use the lift irrigation system when necessary. On the other hand, *Rabi* (spring) crops are wholly dependent on lift irrigation.

Meanwhile, Parmalpur's semi-arid agriculture system is characterized by an irrigation canal system and tube wells owned by individual farmers. Both *Kharif* and *Rabi* crops are completely dependent on irrigation canals. Alternatively, farmers use tube wells when the irrigation canal dries up.

The total area planted in Parmalpur is 57 percent higher than in Khamkalan. Parmalpur farmers also have larger (*i.e.,* by almost a hectare) combined and per parcel landholdings than farmers in Khamkalan. Cropping intensity, or the rate of land use during cropping seasons, is also higher (by 44 percent) in Parmalpur than in Khamkalan.

Parmalpur likewise grows more crops on its lands. Rice and wheat are its major crops, while mustard, linseed, gram and lentil are common secondary crops. Khamkalan farmers tend to observe a longer fallow period and focus on growing paddy and wheat.

Farmers in Parmalpur and Khamkalan have fairly good access to land. Almost all farmers in both villages are owner-cultivators and only a few are mortgagors and shareholders. These lands are mostly acquired by inheritance while the rest are either bought or acquired through agrarian reform.

Adoption of Alternative Farming Practice

Both Parmalpur and Khamkalan farmers know little of Sustainable Agriculture technologies, the former being much less knowledgeable than the latter.

Soil Management

The application of animal manure is the most common practice adopted by the farmers to enhance soil fertility. Some farmers also practice a form of composting but none of them is trained to do it properly.

In Khamkalan, as much as 81 percent of farmers use animal manure on their farms; 5 percent practice composting; and 10 percent apply chemical fertilizers. In Parmalpur, all farmers use chemicals to fertilize their farms, although 41 percent also use animal manure and 20 percent practice composting.

Plant Pest Management

None of the farmers in either village practices sustainable pest management techniques. In fact, almost all farmers (98 percent) in Parmalpur and 8 percent of those in Khamkalan use chemical pesticides.

Cropping Pattern

The two villages are characterized by different cropping patterns, which are in turn determined by the source of water for agriculture. Khamkalan farmers observe a longer fallow period for paddy and wheat cultivation, while in Parmalpur, wheat is rotated with secondary crops like mustard and lentils, with a fallow period observed after the second cropping.

Seed and Planting Material

Different seed varieties are used in the two villages. In Khamkalan, most farmers (86 percent) use traditional varieties, while in Parmalpur, most (87 percent) prefer the improved lines. Generally, however, farmers in both villages use high-yielding varieties: 93 percent in Khamkalan and 81 percent in Parmalpur.

Utilization of Organic Materials

There are enough organic materials for use in the farm, as farmers in both villages attested. Such materials may be sourced within the farm, or within or outside the village.

Cost of Agricultural Inputs

Parmalpur's farmers spend more than Khamkalan's farmers do in growing both major and secondary crops. In particular, they spend 107 percent more on secondary crops, and some 55-64 percent more on major crops. The discrepancy could be explained by differences in farming practice in the two villages.

For example, Parmalpur's farmers use as much as 20 times more chemical fertilizers than do farmers in Khamkalan. In fact, Parmalpur's higher production cost can be attributed to this difference in fertilizer spending. Khamkalan's farmers spend a lot less on fertilizers partly because they use animal manure in place of chemicals, but mostly because they can't afford to buy more of it.

However, in both villages, wheat and paddy production use up more chemical fertilizers than other crops. Farmers in Khamkalan as well as Parmalpur are also generally unaware of the proper application of fertilizers, and thus get lower yields than they should.

Farmers in Parmalpur allot 1.3 to 1.8 percent of their total production cost on irrigation for all of its crops except paddy where irrigation costs twice as much. Farmers in Khamkalan do not spend on irrigation since their crops are mainly rainfed.

On the other hand, farmers in Khamkalan spend more on seeds than do those in Parmalpur. In fact, the cost of seeds makes up a bigger portion of the total production cost in Khamkalan than in Parmalpur, especially in the case of gram, lentils, linseed, and wheat.

Labor makes up the bulk of spending of farmers in both villages. Labor requirements are highest during planting and harvesting, particularly for paddy.

Farm Productivity and Farm Income

In Parmalpur, the highest farm yields are derived from paddy and wheat production while in Khamkalan, the top grossers are gram/pigeon pea and wheat. Mustard trails the other crops in both villages. Livestock products, particularly cow's milk, are also underperformers in both villages.

Most of Parmalpur's farmers sell their crops, while those in Khamkalan either use their produce to repay loans or consume it themselves. Yet, Parmalpur's farmers are no better off financially from selling their produce.

Some 14-30 percent of their wheat and paddy produce goes towards repaying loans; 6-8 percent is used to pay their farmworkers; and 1-11 percent is put aside as planting material for the next cropping.

In Khamkalan, farming is largely subsistence rather than income-generating. Yet, farmers set aside more of their produce (especially of wheat and paddy) to pay off their loans than to feed their families.

The net income from the production of major and secondary crops in both Khamkalan and Palmarpur is quite low.

Gram/pigeon pea and lentil cultivation appear to be the most profitable for farmers in Khamkalan. The average net income per cropping from gram/pigeon pea cultivation is Rs 5,390 or US$128, while from lentil it is Rs3,650 or US$87.

Farmers earn only half as much from growing major crops, i.e., paddy and wheat. For instance, paddy production earns only Rs 2,250 or US$53 a hectare, or a net income of US$101 a cropping (duration: four months). Farmers earn just a little more from growing wheat, at US$118 a cropping.

In Parmalpur, paddy, lentil and wheat production generate the highest income. With earnings from major crops and few secondary crops, Parmalpur is in a bit better condition than Khamkalan. Its highest profit is generated from paddy production, at an average net income of Rs 9,050 or US$215. Lentil production comes second, with an average net income equivalent to US$198; followed by wheat, with US$165.

In general, net returns are higher in Parmalpur than in Khamkalan, except for gram/pigeon pea. It is particularly higher in paddy, wheat and lentil production. Mustard growing has the lowest return in both areas.

Access to Credit

In Khamkalan, farmers choose between local moneylenders and the rural bank, which lend at 5 percent and 10 percent interest, respectively. Relatives and neighbors are likewise immediate sources of credit. However, in all cases, the loan amount is minimal, including loans taken out from the bank. On the other hand, Parmalpur farmers appear to borrow only from the State Bank of India, which lends at 9 percent interest.

Marketing

Local traders are the major buyers of almost all types of crop produce. In Parmalpur, sales are highest for paddy, lentil and linseed, while in Khamkalan, gram/pigeon pea, linseed and paddy are the biggest sellers.

Khamkalan and Parmalpur products are similarly priced, but their marketing costs are not the same. Due to terrain and distance from the city, marketing costs are about 50 percent higher in Khamkalan than in Parmalpur. This translates to lower incomes for Khamkalan farmers.

Food Security

In Khamkalan, most of the food consumed by the family is bought and takes up almost half or 48 percent of the total household income. The portion of the harvest set aside for a family's consumption is clearly not enough to last a family until the next harvest period.

In Parmalpur, only 27 percent of the household income is allocated for food. While the percentage of yield consumed by the household appears to be smaller than in Khamkalan, the absolute volume is actually higher. As a result, Parmalpur households depend less on the market for their food needs and are in this sense more food-secure. Moreover, with their higher yield and other non-farm sources of income, Parmalpur farmers also have greater purchasing power.

Nevertheless, spending on other household needs and loan repayments limits the households' option to allocate more of their produce for their own consumption. Paddy, wheat and mustard are the usual crops saved for household consumption in Parmalpur, while households in Khamkalan generally consume their wheat and mustard produce.

Moravapalli and Kothapalli

Pulicherla Mandal, Chittoor District, Andra Pradesh, India

Project Site Profile

Prepared by: South Asia Rural Reconstruction Association (SARRA)
Edited by: Teresa Lingan–Debuque

THE PROJECT SITE in South India consists of two villages (Moravapalli and Kothapalli) located in the municipality of Pulicherla Mandal of Chittoor District, Andra Pradesh, India.

The majority of families in the two areas belong to the scheduled (untouchable) caste; while the rest are classified as "economically backward" or "backward caste". Half of the families are nuclear families and the other half are extended families, with an average of four members.

Agricultural Practice

Farming is the major source of income of all families in the two villages. Most own their farm lands, although there is a rather huge gap in the size of landholdings: 56 percent of landholders have less than a hectare each and are considered marginal farmers; while 26 percent are small farmers, with two hectares of farmland each. The rest of the farmers (18 percent) are landless agricultural workers.

To augment their farm income, marginal farmers and their families hire out their labor and raise some livestock. Small farmer households, on the other hand, engage in various regular and temporary employment.

Small farmers and a few marginal farmers earn Rs.40,000-Rs.50,000 (US$950-US$1,200), or an average of US$3 a day (2004). On the other hand, landless and marginal farmers earn less than Rs.10,000 (US$238), or a measly US65 cents a day. Apparently, household farm incomes are a function of the size of landholdings as well as of landownership.

Of the farmer-owners, 76 percent acquired their land as a result of agrarian reform, 22 percent inherited it, and 2 percent bought it.

Groundnut (peanut) is the major crop in the project site. Some 40 hectares in all are planted to this crop. However, due to lack of rainfall, only part of this land area is actually cultivated. Farmers also grow secondary crops such as mango orchids, *jowar* (a type of millet), and horse gram (a type of pulse used as animal feed).

Most farmers are dependent on rain for farming, including farmers in upland areas (95 percent) and the small number of them in lowlands (2 percent). Only 2 percent of farmers benefit from irrigation.

Most farmers also raise livestock. Eight-eight percent of them have four poultry birds; 40 percent have three cows; and one family has 18 heads of sheep.

Adoption of Alternative Farming Practice

Farmer-owners in the project site practice a combination of conventional and Sustainable Agriculture methods.

Soil Management

The practice of applying animal manure as fertilizer is familiar to the farmers, but few of them actually use it on their farm lands. In fact, half of the marginal farmers and 60 percent of small farmers prefer chemical fertilizers. A very small percentage practices mulching, while none of the farmers has adopted green manuring and cover cropping.

Plant Pest Management

None of the sustainable pest management techniques is observed among the farmers. At the same time, only a few of them (5 percent of marginal farmers and 15 percent of small farmers) reported using chemical pesticides.

Cropping Pattern

Ninety percent of farmers engage in intercropping. Other cropping methods, however, such as polyculture, crop rotation and multi-storey cropping are unknown to them.

Seed and Plant Material

Most farmers (90 percent) prefer improved varieties of seeds and planting materials. Only a few (10 percent) opt to use traditional varieties. However, almost all of them use high-yielding seed varieties.

Cost of Agricultural Inputs

Seeds account for the bulk of spending by both marginal and small farmers. Besides their high cost, the high-yielding seeds which the farmers prefer are not easily accessible and are prone to pest infestation.

A few farmers have been observed to use pesticides, although there is no available data on actual spending.

Since most of the farms are rainfed, farmers do not spend on irrigation.

Marginal farmers pay hired hands only during planting, and spend an average of Rs.300. The rest of the time, farm work is done by family members and other relatives and is therefore unpaid.

An average of eight people are needed for each farming task. Except for planting, where females dominate, all other activities are done by an equal number of men and women. Male and female workers are paid the same wages.

Small farmers have more labor requirements. Some 20 to 25 people, mostly women (77 percent), are hired for planting, weeding and threshing. These get Rs.10 for land preparation and Rs. 40 for planting, but much less for the other tasks. Hence, 40 percent of small farmers' spending on labor is allocated for planting.

Women are paid the same as the men. However, the women also make up the majority of unpaid laborers who are recruited for land preparation and drying.

Small farmers pay double the amount paid by marginal farmers on machine rental and workers' food, since their bigger farm lands require more work than family members can handle.

Farm Productivity and Farm Income

Recent records of gross production value generated would indicate that marginal farmers are more productive than small farmers. However, this may be explained by the fact that fewer small farmers than marginal ones actually did any farming in that cropping, and on a smaller area than that planted by marginal farmers (i.e., 4.4 hectares compared to 6.4 hectares planted by marginal farmers).

As it happened, the small farmers opted to concentrate on other income sources rather than risk crop failure due to limited rains.

In the meantime, landless households that raised livestock yielded only 10 percent of the gross production value attained by small and marginal farmers.

Groundnut production yielded a high return, despite the reduced effective area planted (less than a hectare each for small

and marginal farmers). The farmers also earned from residual products from groundnut production, such as fodder and pulses. Cow's milk production yielded a return of 79 to 94 percent, excluding the income from selling the calf and manure.

Access to Credit

The majority of farmers have outstanding obligations ranging from Rs.5,000-Rs.15,000 (US$120-US$360), while a few have much larger loans.

Self-help groups (SHGs), money lenders, banks and other groups are common sources of credit. However, farmers prefer to go to SHGs (44 percent) and even moneylenders (20 percent), who charge as much as 24-28 percent interest a year, because of the ease and speed at which loans are released. For bigger loans, however, banks are still popular. Meanwhile, among landless workers, SHGs are the only option.

Loans are frequently used to buy food or to pay for health, education and other household expenses. Only the small farmers take out loans for farming purposes.

Marketing

The farmers sell 50-60 percent of their groundnut produce and 80 percent of the cow's milk. Groundnuts are generally sold to middlemen, cow's milk to dairies, and mangoes and sheep at the market. All these products are sold fresh and unprocessed, as none of the farmers is engaged in processing their products.

Groundnut producers complain of various marketing-related problems, namely: (1) lack of storage space and facilities; (2) absence of a credit facility or village-level market support from the Government; (3) lack of skills in product processing; (4) absence or inaccessibility of other market outlets, such as factories, which forces farmers to sell only to middlemen; and (5) corruption in the marketing of groundnuts.

Food Security

Some 13 to 14 percent of livestock products and 21-28 percent of the groundnut produce are set aside for household consumption. This indicates a level of household food security, at least insofar as peanut and milk consumption are concerned.

Purchasing power among the farmers is also rather high, since half of them spend just Rs.10,000-Rs.20,000 (US$238-476) on food. Only 14 percent spend more than this. However, this food budget is still small considering that farmers buy all of their rice.

Banjaroya, Banjarasri, Jatisarono, Pagerharjo, Giripurwo and Hargorejo,

Kulon Progo, Jogyakarta, Indonesia

Project Site Profile

Prepared by: World Food Day Secretariat
Edited by: Teresa Lingan–Debuque

The six villages of Banjaroya, Banjarasri, Jatisarono, Pagerharjo, Giripurwo, and Hargorejo comprise the project site in Kulon Progo, Jogyakarta, a city in southern Java, southeast of Jakarta. The main Kulon Progo region is a rain-fed area. About 80 percent of the project site is located in a sloping area; the rest is in flat or lowland areas.

Households generally have four to five members. A few households (10 percent) are quite small, with just two to three members.

Households earn rather low incomes from both farm and non-farm work—less than Rp.500,000 (US$60) a year, or US16 cents a day. Moreover, almost half of all households earn no income at all.

Nonetheless, households generally own their homes, homelots, and farmlands. The average landholding is about 6,000 square meters in size, or a little more than half a hectare. Yards or tree plantations, on the other hand, have an average size of about 10,000 square meters or one hectare.

Agricultural Practice

Sixty-seven percent of farmers are owner-cultivators. Thirteen percent are concurrently owner-cultivators and share tenants on other land parcels; and the rest are alternately share tenants, farm workers and owners.

Kulon Progo gets its water from the rain and the river. Hence, farmers generally depend on the rain and other natural water sources, such as the river and deep wells. Access to irrigation is rare.

Rice and cassava are the most common crops planted by farmers. However, many of them are also engaged in the cultivation of coconut, maize, cloves and tubers.

On hilly land, farmers usually plant more than one secondary crop. Lemongrass, soybean, vanilla, etc. are planted alongside cassava, fruit trees, palm trees and clove. A number of fruit trees, such as durian, jackfruit, avocado and others, can also be found being grown on farmlands.

Chicken is the most common livestock raised in the villages, although goats, cows, rabbits and ducks are also seen around the villages. A very small percentage of households are engaged in fish cultivation.

Adoption of Alternative Farming Practices

Many of the farmers practice Sustainable Agriculture, especially in regard to soil fertility management and cropping method.

Soil Management

Farmers use animal dung (36 percent) and compost (31 percent) to enhance soil fertility. A few others use rice straw and green manure. Farmers have access to a variety of organic materials to fertilize the soil.

Plant Pest Management

To control pest infestation, farmers have a wide range of local materials to choose from, including bitter leaves, ginger, galangal and other medicinal crops. By adopting multiple crops, the farmers help stabilize the agroecosystem, thus reducing plant pest infestation and diseases.

Cropping Pattern

A little over half of the farmers are engaged in multiple cropping (i.e., combining major crops and fruit trees with secondary crops), as evidenced by the diversity of agricultural products in the project site. On rice lands, a number of farmers adopt variations in crop rotation, for example, alternating rice cultivation with cash crop production.

Cost of Agricultural Inputs

Because of their heavy reliance on local materials to fertilize the soil and to control pests, the farmers spend little, if at all, on agricultural chemicals.

They also generally don't have to pay farm workers as much of the work is done by them or by household members and relatives—a common enough practice among poor farming communities.

Farm Productivity and Farm Income

Farmers get their highest yields from cassava, at 10 tons a hectare. Rice is a distant second, yielding 4.5 tons a hectare, followed closely by maize/corn, at four tons a hectare.

However, growing rice is by far the most profitable, yielding an average gross income of Rp 6,750,000.00, or about US$ 794. Corn comes next, with US$470, and cassava, with Rp 294.

Access to Credit

There are various credit sources in the project site. Formal sources include banks, the credit union and cooperatives. Farmers who are members of cooperatives can acquire collateral-free loans at 1-3 percent interest a month.

The banks charge 16-20 percent interest a year and require collateral. Banks generally give out bigger loans (average: Rp3,000,000 [US$353]) than do cooperatives (average: Rp1,200,000 [US$143]).

Neighbors and local stores are alternative (informal) credit sources. Such loans usually pay for the seeds and are repaid upon harvest. Farmers also borrow money to pay for farm labor, especially during land preparation and planting, but they have to pay this back soon after (i.e., after one to two weeks). Credit from local stores—usually for food items—has to be repaid in one to five days.

Marketing

The traditional market is the most common venue for selling produce. The local market and middlemen are also common distribution channels, especially for bulk sales. Other farmers sell their products to cooperatives and selected groups or contacts.

Food Security

Households generally consume their fruit products, and sell these only when necessary.

Rice is the staple food, but is sometimes replaced by cassava and taro, especially during a drought.

In the uplands, vegetables are grown mainly for household consumption. In the lowlands, however, vegetables are mostly sold.

Banjarnegara, Punggelan and Paseh Sub-Districts

Propinsi Jateng, Indonesia

Project Site Profile

Prepared by: Sekretariat Bina Desa
Edited by: Teresa Lingan–Debuque

The project site in Propinsi Jateng District in Indonesia consists of the villages of Banjarnegara, Punggelan and Paseh. All three villages are in the uplands.

The typical household in the three villages is small, with just four members on average.

Farming is a major source of income in the three villages. Thirty-one percent of households rely on it exclusively, while 51 percent combine it with non-farm work. The rest are engaged solely in non-farm activities, such as trading, carpentry or construction labor, or are employed as teachers and local government personnel.

Sixty-three percent of the total household income is derived from non-farm sources. With more income coming from non-farm activities, each household earns an average of Rp 11,100,807 (US$1,306) a year, or US4/day.

This income level is relatively high for a family of four. However, there are significant income differences among households, with the most well-off earning US$5000 and the poorest, a mere US$125 a year.

Agricultural Practice

Farmers either own or rent their farmlands. Eighty-six percent have their own farmland, most of which were inherited and some were purchased. Many of the farmers have been working on their lands for over 10 years.

As the villages are located in the uplands, almost half of the farmlands are rainfed. Meanwhile, of the lowland farms, 21 percent are rain-dependent.

Despite this, the farmers are able to grow a number of major crops, such as zallaca palm, rice paddy and cassava. A variety of secondary crops, along with various tree species, are also cultivated in the villages. Banana is a common secondary crop, frequently planted on farmers' second parcel of land. Other secondary crops are coconut, albasia, long beans and corn, among others.

Some livestock are also raised in the villages, such as goats, chickens and ducks. A few farmers maintain fishponds.

The practice of Sustainable Agriculture is widespread in the three villages. Sustainable agriculture adoptors attest to the initial decline in production following the shift to Sustainable Agriculture, and to the eventual recovery of the soil, leading to improved fertility and better yields in future.

However, a significant number of farmers (20 percent) are unfamiliar with Sustainable Agriculture technologies and unaware that these are being implemented in their village.

Adoption of Alternative Farming Practice

Soil Management

Almost all of the farmers are used to or have tried out some form of soil conservation/ enhancement method. Seventy-five percent of the farmers apply animal manure on their crops; a smaller percentage practices mulching and composting; while some maintain hedgerows and cover cropping.

The diversity of soil conservation practices indicates the farmers' high level of awareness of how local materials can be used to conserve and manage the soil.

At the same time, however, 25 percent of the farmers use chemical fertilizers and lime for the same purpose, especially in paddy cultivation.

Plant Pest Management

The farmers are rather less familiar with sustainable pest management practices. Nonetheless, there is at least one farmer practicing each type of pest management technology, the most common of which is Integrated Pest Management (IPM), which has been adopted by a number of farmers. However, the use of pesticides, particularly, nematocides, is still quite prevalent.

Cropping Pattern

Seventy-two percent of the farmers practice polyculture, or the cultivation of multiple crop species on the same land, which is more sustainable than the conventional monoculture.

Other farmers engage in crop rotation, multi-storey cropping and intercropping. However, some 12 percent of the farmers have kept to monoculture, especially in paddy cultivation.

Seed and Plant Material

Judging solely by the kind of seed and planting material used, almost 75 percent of the

farmlands may be classified as under Sustainable Agriculture.

Fifty-three percent of the farmers prefer to use improved lines, especially for zallaca palm production. Other farmers (21 percent) producing paddy, albasia and cassava use both improved lines and the traditional variety.

On the other hand, hybrid and high yielding varieties are also used by some farmers (22 percent), especially for paddy production.

Utilization of Organic Material

Farmers have easy access to organic materials; hence the widespread practice of applying them on the farmlands. Half of them get such materials within the farm itself; others outside the farm, but within the village.

Cost of Agricultural Inputs

Paddy production using chemicals is 15 percent more expensive than organic production, owing primarily to the high cost of chemical fertilizers and pesticides. Seed, labor and milling costs, however, are about the same for both farming systems.

Labor costs may seem to be slightly higher for organic farming (68 percent of the total cost for organic farming vs. 59 percent of the cost of chemical farming) but in fact, both systems require the same manpower for all farming activities. Labor costs are particularly high during land preparation, planting and harvesting.

In particular, the cost of zallaca palm production is highest in the first year and tapers off towards the fifth year. After the initial spending on seeds, which accounts for as much as 71 percent of the total cost, the zallaca palm stem generates yield for several years, thus reducing the production cost by 70 percent on the second year.

Fertilizer costs are also higher in the initial year and then level off at 40 percent of total cost until the fifth year. Labor makes up the bulk of spending till the fifth year, at 60 percent of total cost, but is still cheaper on the second year onwards because there is no longer need for land preparation, planting and re-planting.

Farm Productivity and Income

The highest yields are derived from cassava, followed by coconut and banana.

The yields of major crops like paddy and zallaca palm are quite low. This is due to the small size of holdings (the average landholding per farmer is 4,300 sq. meters) and the lack of irrigation. Yet, farmers still earn more from cultivating them compared to other crops.

Moreover, the diversity of agricultural products cultivated in the project areas augments the income from farming and to some extent lessens the farmers' vulnerability to unfavorable farming conditions.

Cost and return estimates show that growing organic paddy should be highly profitable—considering the potential yield of 7.5 tons a hectare.

Milled organic rice should produce a 178 percent return on investment (ROI), compared to ordinary rice's 123 percent ROI.

Hence, the net return a hectare from organic paddy production would be about US$ 400 and US$1,000, for unmilled and milled rice, respectively. Chemical cultivation produces a much lower net return: US$ 300 and US$900, for unmilled and milled rice, respectively.

On the other hand, the cost and return estimates for zallaca palm production forecast that in the first year, farmers would at best break even, because of the initial high cost of seeds/stem. Actually, a negative net return would be quite probable on the first year. However, in the fifth year, the net return is expected to be double that of the cost of production.

Marketing

Agricultural products, particularly the major crops, are sold *unprocessed* to the *tengkulak,* or middlemen.

Food Security

Households sell *all* of their products, except for a small portion of their paddy and zallaca palm harvest which they set aside for the family's consumption. This explains their high spending on food. Therefore, household food security in the three villages is more a function of income rather than production.

Bgys. Sinayawan and Tongantongan

Valencia City Bukidnon, Philippines

Project Site Profile

Prepared by: Philippine Partnership for the Development of Human Resources in Rural Areas (PhilDHRRA)
and Organic Rice Industry Technical Working Group (ORI-TWG)
Edited by: Teresa Lingan-Debuque

The project site in Bukidnon consists of two villages: Tongantongan and Sinayawan. Tongantongan has a land area of 3,300 hectares, 59 percent of which is lowland and the rest, upland. Roughly half of the lowland area is rainfed, and the other half, irrigated. Two rivers—Maapag and Pulangi—supply the village with water.

Tongantongan supplies rice to nearby Valencia City and Cagayan de Oro City. Sinayawan has a total land area of 1,891 hectares, of which 68 percent is classified as plain and the remaining 32 percent as hilly. Some 426 hectares of its land are devoted to agriculture. Its agricultural area covers approximately 425.98 hectares. Sinayawan is Valencia City's largest rice producer.

Two members of every household (averaging five members each) do on-farm, off-farm, or non-farm work. Eighteen percent are salaried employees or run their own business; a few make a living from raising livestock.

However, all households depend on agriculture for most or all of their income. Eighty-two percent are engaged in organic rice farming, 55 percent are corn producers, and some grow rice, sugar, coffee, and vegetables.

The average household income a year ranges from PhP50,001 to PhP100,000 (US$ 910 to US$1,800), or US$2 to US$5 a day. At this level, families are hard-put to provide for their household needs, especially during the lean months.

Agricultural Practice

The majority of farmers (65 percent) own the land they cultivate. This means that they are able to make decisions concerning their farmlands. Most of the lands were purchased, inherited, or awarded through agrarian reform.

Agricultural landholdings are quite small, averaging 1.31 hectares a farmer. In fact, almost 25 percent of farmers have less than a hectare each, while a few have five hectares or more. The majority have one to two hectares.

Most farm lands are irrigated and found in the lowlands. Only a few are rainfed.

Rice is cultivated exclusively on 42 percent of the farm lands. Rice, as well as livestock, is grown on another 42 percent of lands, while the rest combine major and secondary crops, and livestock.

The other major crops are vegetables, banana, corn, and mango. Fruit trees are secondary crops.

Adoption of Alternative Agricultural Practice

The farmers have a rather wide knowledge of sustainable agricultural practices. However, conventional farming is still prevalent.

Soil Management

A large number of farmers have adopted practices such as mulching and planting of hedgerows. Cover cropping, composting, and use of green manure are other common practices to enhance the fertility of the soil. However, nearly half of the farmers are still dependent on synthetic fertilizers and lime.

Plant Pest Management

Only a few farmers here use chemical pesticides. Ecological pest management (EPM), which uses the interactions among pests, predators, and microorganisms on the farm to control pest infestation, is the most popular system for managing plant pests, followed by the use of biological pest repellants and Integrated Pest Management.

Cropping Pattern

The majority of farmers still practice crop monoculture. Very few have adopted polyculture, and other forms of crop diversification on their farm lands.

Seed and Plant Material

Most farmers (65 percent) use or prefer traditional crop varieties, especially the improved (by plant breeding) ones. A few use hybrid varieties.

Availability of Organic Material

Organic matter for soil management is plentiful and easily available in the project site.

Plans to Adopt or Upscale Organic Farming

Farmers who are the most informed or knowledgeable about Sustainable Agriculture are the most inclined to adopt new techniques. Many of them in fact are making plans to adopt organic farming, while others would like to convert more of their lands to organic farming.

Cost of Agricultural Inputs

The high rate of adoption of Sustainable Agriculture, particularly LEISA (Low External Input Agriculture) in the project site is reflected in their relatively low spending on inputs—PhP 3,925 or 28.3 percent of the total production cost—and their high labor costs—65 percent of total production cost.

Spending on seeds is low, as farmers produce their own or trade seeds with other farmers. Land rent is paid only by the few who do not own their lands. Water is mostly supplied by the two big rivers in the area.

Other expenses amount to some PhP 600 a hectare. These include food for workers, fuel and oil among those who have their own irrigation pump and other equipment, and rent on equipment for those who do not have their own.

Farm Productivity and Farm Income

The average rice yield is 4.12 tons or 82 cavans a hectare. This is a better than average performance, and proves that organic rice farming can be just as viable as conventional rice farming.

In fact, rice production in the project site shows a 208 percent return on the cost of production, and gives farmers a net income of PhP7,261.60 a month.

Access to Credit

The most popular source of credit in the project site are private individuals, who also happen to charge the highest interest rates (5-9 percent a month on loans ranging from PhP 9,000 to PhP 23,000) but are frequented nonetheless because they supply credit quickly.

Cooperatives and NGOs also give out loans ranging from PhP 5,000 to PhP 24,000, and charge a lower interest rate (2.5 percent, and 3-4 percent a month, respectively). Local traders and investors are another common credit source, charging six percent interest on loans not bigger than PhP 37,500. Banks and government lending institutions are the least popular source of credit.

Marketing

Farmers sell as much as 75 percent of their rice harvest, and set aside just 15 percent of it for their own consumption. The rest is saved for the next cropping or used to pay farm workers. None of the rice harvest goes towards paying loans.

Organic rice is sold to cooperatives, NGO marketing groups, traders, retailers, or directly to consumers. Inorganic rice is sold to traders and other groups who provided the production loans.

BOPC, a non-government organization engaged in marketing of organic produce, pays the highest prices for organic rice, or as much as PhP10.50 a kilogram. MAKAKABUS, an organization of organic rice growers, facilitates the sale of organic rice produced by its members to BOPC.

BOPC buys unmilled rice from the farmers, paying PhP0.070 more than the farmgate price, processes it, then packs and delivers it to supermarkets and other outlets.

Another NGO, KAANIB, is also engaged in buying fresh organic rice, paying PhP 0.30 more a kilogram than the prevailing price, and sells it to supermarkets or directly to consumers.

Food security

Households spend PhP 27 to PhP 55 on food a day, or PhP 5 to PhP22 a person in a five-member household. This does not seem like much, but then food is relatively cheap in the area. Besides, households generally put aside over a 10th of their rice harvest for their own use.

Judging by the fact that households produce their own staple food and usually have enough money to buy their other food needs, they can be said to be food secure. However, there are still a few households in the project site who borrow money just to buy food.

Brgys. Tuato and Tual

Pres. Quirino Sultan Kudarat, Philippines

Project Site Profile

Prepared by: Philippine Development Assistance Programme, Inc. (PDAP)
Edited by: Teresa Lingan–Debuque

One project site in the Philippines is located in Sultan Kudarat, and includes three barangays: Tuato and Tual in President Quirino; and San Emmanuel in Tacurong City.

Brgys. Tual and Tuato are predominantly agricultural areas. Of the 867.07 hectares comprising Barangay Tual, 858.51 hectares (or 99 percent) are agricultural. Similarly, 90 percent of Barangay Tuato's land (or 832.06 hectares out of a total land area of 921.07 hectares) is devoted to agriculture. Both barangays are primarily rain-fed lowland, and drought-prone.

There are two distinct seasons in both places: wet and dry. The dry season starts in October and ends in April in Tual; while in Tuato it starts much earlier, in January. The month of May signals the beginning of the wet season in both barangays, lasting till September in Tual and till December in Tuato. Palay and corn are planted in Tuato during the wet season, while sugarcane is planted/harvested throughout the year.

The majority of households, averaging five members each, have two income-earners. A smaller number of households are supported by just one income-earner, while the rest have three to five members earning a living for the family.

Agricultural Practice

Most households depend on farming, although a significant number is engaged in non-farm work, such as salaried employment and wage labor, as well as off-farm work, such as selling and processing of agricultural products.

Of the households engaged in farming, more than half cultivate sugarcane exclusively; some grow rice besides sugarcane; others grow corn, vegetables and coffee in addition to sugarcane; while a few are plain rice farmers.

In Barangay Tual, sugarcane, rice, and corn are the main crops. The area planted to sugarcane is the largest agricultural area devoted to a single crop, but it has been declining in recent years: from 368.25 hectares in 2001 to 254.25 hectares in 2003. However, its production yield (recovery) has held steady at 5.0 tons a hectare. Rice lands occupied some 300 hectares from 2001 to 2003, with yield rising in 2002 then declining in 2003. Meanwhile, corn productivity increased from 2.5 tons a hectare in 2001 to 3.2 tons a hectare in 2002, and held at that level in 2003.

Livestock are also raised in Tual. In 2001, these included buffaloes, cattle, pigs, sheep, goats, ducks and poultry. Except for a creek, there are no water bodies large enough to support fisheries-based livelihood. The barangay has 35 variety/convenience stores, and this number has remained constant from 2001 to 2003. It also has two agricultural input suppliers and 10 traders of muscovado or raw sugar.

Barangay Tuato's households are mostly engaged in farming. While some of its residents are engaged in non-farm work, their number has remained constant from 2001 to 2003. They would be found doing construction-related work, vending, driving tricycles, and doing other service-related work.

Livestock are raised, of which the most common are ducks and chicken, for the household's consumption and as an added source of income. Fisheries are non-existent. Commerce has not grown much in recent years. The number of variety/convenience stores, traders, and muscovado dealers and millers has stayed the same in three years (2001-2003).

Less than half of farmers have security of tenure as owner-cultivators. An almost equal number are share tenants, and the rest are leaseholders.

Close to half of landholders have one to two hectares of land; about a fourth of them have as much as five hectares and more; while a few have less than a hectare of land. The average size of landholdings is 3.575 hectares.

Most of the farmer-owners also own two parcels of land; about a fourth of them have one parcel each; while some have as many as eight parcels.

Land was acquired on the basis of a "verbal agreement", or was bought or inherited. Only a small percentage of the land was acquired through agrarian reform, or was held by virtue of "cultivation rights".

Adoption of Alternative Farming Practice

Most of the farmers are engaged in conventional farming. However, a number of them have been observed to practice Sustainable Agriculture, primarily in their choice of seeds, and to a lesser extent, in the way they maintain/conserve the soil, manage pests, etc.

Soil Management

The use of compost as fertilizer is the most common form of alternative soil management practice in the project site. Many farmers have also been seen to use mulch-

ing material, animal and green manure, cover cropping and hedgerows.

Nonetheless, the greater majority of farmers still prefer to use chemical fertilizers, especially in rice farming.

Plant Pest Management

A small number of farmers practice a variety of sustainable plant pest management techniques, such as Integrated Pest Management (IPM), Ecological Pest Management (EPM) and the use of pest repellants and bio-sprays. However, close to half of farmers use chemical pesticides, while others use nematocides.

Cropping Pattern

The majority of farmers practice monoculture, especially since they are mostly sugarcane farmers. On the other hand, most of the rice farmers have adopted such practices as crop rotation, intercropping and polyculture.

Seed and Planting Material

More farmers opt for traditional and mix varieties over the improved lines.

Utilization of Organic Materials

Almost all of the farmers utilizing local materials for feeds get those materials from their own farms.

Willingness to Try New Farming Technologies

Almost half of the farmers are not considering changing their crop/s or the practices they have grown used to. However, some have said that they are willing to try new farming technologies, such as intercropping, "mudpress" and other Sustainable Agriculture practices. A few are inclined to changing crops. This indicates that it might not be too difficult to introduce Sustainable Agriculture technologies.

Cost of Agricultural Inputs

Labor accounts for the biggest expense in both sugarcane and rice cultivation.

Spending on seed cane is minimal, ranging from PhP 70-200 only, since much of the planting material is taken from the previous stands of sugarcane. For rice farming, the cost of seed makes up the smallest percentage of the total production cost a hectare. On the average, farmers spend about PhP 1,000 on seeds. However, users of hybrid seed varieties spend more—almost PhP 2,000 a hectare.

Rice farmers spend PhP 2,000 a hectare on chemical fertilizers. This comes out to about 15 percent of their total production cost. On the other hand, a mere 2 percent of total spending by sugarcane farmers goes on chemical fertilizers.

Rice farmers spend PhP 1,700 a hectare on chemical pesticides and other inputs, and

this accounts for 10 percent of their total production cost. On the other hand, none of the sugarcane farmers report buying or using chemical pesticides on their crops.

At least among the farmers with no holdings of their own, land rent accounts for the one of the major costs in sugarcane production, next only to labor. It averages at PhP 16,454.30 a hectare.

In rice production, land rents amount to over PhP 5,000 a hectare. Hence, for those that have to pay it, they account for about 30 percent of the production cost, and, consequently, a much lower income from farming.

Processing is a major cost in sugarcane production, since income is derived from selling its by-products rather than fresh canes.

Farm Productivity and Farm Income

Sugarcane farmers earn more than rice farmers. The net income from sugarcane is about PhP 76,000, or US$1,400, a hectare. This is a return of 171 percent on cost. Given that sugarcane is harvested in batches, this income is spread throughout the year and comes out to an average of PhP 6,300 a month.

Sugarcane farmers also earn from sugarcane by-products. Muscovado is the highest income-earner among the by-products.

While sugarcane farming is profitable, many sugarcane farmers also grow rice, which earns for them an average yearly net income of PhP 11,000, or US$ 200, a hectare. This translates to a monthly net income of PhP 2,750, or US$50.

Access to Credit

The most common sources of credit among the residents are informal ones, such as private individuals, variety stores, and landlords. Banks are rarely approached for loans because of their collateral requirements and longer processing times.

Banks usually charge 14.8 percent interest a year. Private individuals have been reported to charge as much as 22 percent interest, but others give out loans with no interest at all.

Landlords traditionally lend without interest, since part of their arrangement with their tenants is to provide the capital for farm inputs. Variety stores charge the lowest interest rates on loans, at 1.8 percent a year.

Tual has access to three nearby rural banks: the Rural Bank of Isulan, offering credit at 2 percent a month; the Rural Bank of Tacurong, charging the same interest rate; and the Rural Bank of Lebak, which charges a lower interest rate (21 percent a year) and

requires no collateral (but is available only to officials of Tual).

Marketing

Most of the rice and sugarcane products are sold to pay household expenses.

Sugarcane farmers do not sell their standing crops or harvested cane, as these are delivered to the mill for processing. The farmers generally produce the by-products themselves, like muscovado sugar (or naturally milled sugar), sliced/candied muscovado, and vinegar, and sell as much as 60 to 84 percent of these. However, they set aside some 14 to 33 percent of the by-products to pay their laborers.

Fifty-three percent of the rice yield is sold to traders. The rest is allocated for household consumption (17 percent), loan repayment (16 percent) and payment for laborers (13 percent). A small portion is also put away for replanting.

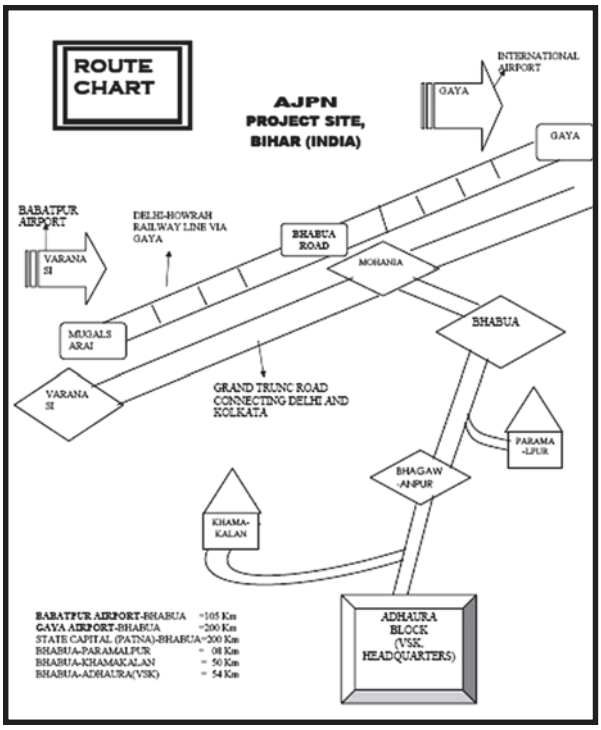
In addition, the corn harvest in Tual is marketed differently in the wet and dry seasons. During the wet season, corn farmers sell their harvest immediately after shelling to local traders. On the other hand, during the dry season, they dry the harvest after shelling it, and then sell it, giving them a better price.

Food Security

Households generally spend about PhP43,000 on food annually, or PhP118 (US$2) a day. In fact, for the majority of households food accounts for no more than half of total spending. Only 9 percent of households spend more than half of their income on f

On the other hand, only about a fourth of respondents in a survey of the project site reported taking out loans to meet their food needs. This seems to indicate that there is usually enough money to buy food for the family.

chapter IV



Khamkalan and Parmalpur

Kaimur, Bihar, India

Site Development Plan

Prepared by: Association of Voluntary Agencies for Rural Development (AVARD)

Kaimur's district headquarters, Bhabua, is 105 km. away from Babatpur airport, Varanasi (Uttar Pradesh) and 200 km. away from Gaya International Airport. Two villages were selected for implementation of the program: (1) Parmalpur, 8 km. from Bhabua (Kaimur); and (2) Khamkalan, 50 km. from Bhabua. Both villages are on the Bhabua-Adhaura Road.

As part of the thrust to disseminate Sustainable Agriculture practices among the masses in Kaimur district of Bihar, it was found befitting to adopt two villages at different locations representing different topographies, soil texture and agro-climate condition.

Khamkalan is on Kaimur plateau, which has undulating terrain, rainfed irrigation, and red laterite and sandy loam soil. Forty-five farmers were selected to adopt Sustainable Agriculture techniques in Khamkalan. Major crops are: paddy, niger, sesamum, linseed, pigeon pea, green gram, lentil, tomato, cabbage, cauliflower, chili, cucurbits, and medicinal plants and herbs in the forested areas.

On the other hand, Parmalpur is in plain area, has clay and sandy loam soil and communication and irrigation facilities. Thirty farmers have been selected to introduce appropriate Sustainable Agriculture techniques in Parmalpur. Its major crops are wheat and paddy.

Statistics/Figures

Table 37. **Village Profile**

Particulars	Khamkalan	Paramalpur
Area of the Village *(sq. km.)*	8.47	1.01
Total Population	621	1,418
Total Households	104	190
Male	308	747
Female	313	671
Adapted Households	45	30
a. SC	—	4
b. ST	33	—
c. Others	12	26
Literacy *(%)*	40	85

Table 38. **Income of Farmers *(by types of crop planted)* Compared with Country & State**

Village	Crop	Local *(Qtl/ha)*	State *(Qtl/ha)*	Country *(Qtl/ha)*	Remarks
Khamkalan	Paddy	26.50		20.86	
	Wheat	18.00		27.70	
	Mustard	3.00		9.00	
	Linseed	4.00		8.97	
	Pigeon Pea	8.60		8.65	
	Lentil	6.80		8.65	
	Tomato	96.50		142.00	
	Cauliflower	91.20		174.00	
	Potato	98.40		180.00	
Parmalpur	Paddy	55.00		20.86	
	Wheat	33.00		27.70	
	Mustard	7.00		9.99	
	Linseed	7.00		8.97	
	Lentil	13.00		8.65	

Resource Assessment

Assets of the Project Site

Khamkalan village's major resources are forest, upland, a river (in which Vanvasi Seva Kendra established a Lift Irrigation Scheme), and livestock. Villagers use cow dung as fertilizer. They have an adequate number of cow, buffalo, goat, and chicken.

Its forest teems with medicinal plants and herbs. Forest products such as mahua (Madhuka Indika), chirongi, kendu, aonla, and bel are being collected by villagers for additional income.

Most of the land is upland (about 80 percent), suitable for pulses & vegetables. There is a training center at Adhaura Krishi Vigyan Kendra.

In Parmalpur, 80 percent of the land is in the lowlands and 20 percent is in upland areas, where farmers practice wheat-paddy crop rotation. They have a canal, which caters the need of water in Kharif and Rabi season. Communicational facility and electricity are available. Livestock is also there, but not as much as in Khamkalan. A rice mill is there to help villagers in marketing of paddy. Some farmers have their tube well for irrigation. Annual average rainfall is 1,100 mm.

Structures and Processes

The three-tiered system of panchyath institutions functions at the village, block and district levels.

These institutions are responsible for the development of the communities by implementing government programs for education, agriculture, livestock development, provision of drinking water, housing, and minor irrigation programs. The local panchyaths play a vital role in implementing development programs and act as a bridge between government departments and the people.

For agricultural extension services, a Krishi Viigyan Kendra, a project of the Indian Council of Agricultural Research, is involved in dissemination of technology within the farming community.

Past Agricultural Practices that Have Failed to Improve the Condition/ Increase Income of Farmers

During the last decade, farmers have adopted technologies which consumed a lot of chemical fertilizers and pesticides. As a result, soil textures and fertility decreased, cost of production increased and net income decreased.

The Project Site Development Plan

Goal

The project aimed to promote Sustainable Agriculture as a means of improving the quality of life of the people of the two villages.

Objectives

1. Increase awareness on the importance of the organic farming;
2. Upgrading farmers' knowledge on organic farming;
3. Mobilize local resources;
4. Increase productivity and cropping intensity;
5. Decrease soil toxicity using SA technologies;
6. Maintain the area's ecological balance;
7. Promote group activities for minimizing risks;
8. Promote "value addition" and market facilities; and
9. Increase net profit from agricultural activities.

Strategies

The project started via a series of training programs in both villages. Farmers were first made aware of, then got interested in, Sustainable Agriculture. They were then introduced to the different substitutes to chemical fertilizers and pesticides.

Then, selected farmers were trained on different sources of organic fertilizers and integrated pest management. Training on composting and green manuring, among other types of organic fertilizers and pesticides, was provided selected farmers.

The second stage of the project involved training selected farmers on sustainable farming practices for paddy, wheat, pulses, oilseeds, vegetables, and medicinal plants. It included post harvest management, like safe storage and value addition.

The third stage was the conduct of demonstrations on improved varieties of selected crops using organic fertilizers to show that there is no effect on yield. This greatly helped in the dissemination and adoption of SA technology. Farmers' visits to agricultural schools that have been proponents of Sustainable Agriculture technology were also undertaken.

The fourth stage was the introduction of "value addition" in organic produce and establishment of markets for selling of produce at a handsome price.

Self Help Groups (SHGs) were formed and were themselves involved in processing, collection and marketing of medicinal plants, forest products and other agricultural produce. These SHGs were critical to the successful implementation and impact of the project.

Workshops were held at the district level, with the help of selected SA farmers, to disseminate SA technologies among the farmers of the district and adjoining areas.

Outputs

1. Assured substitutes for chemical fertilizers and pesticides;

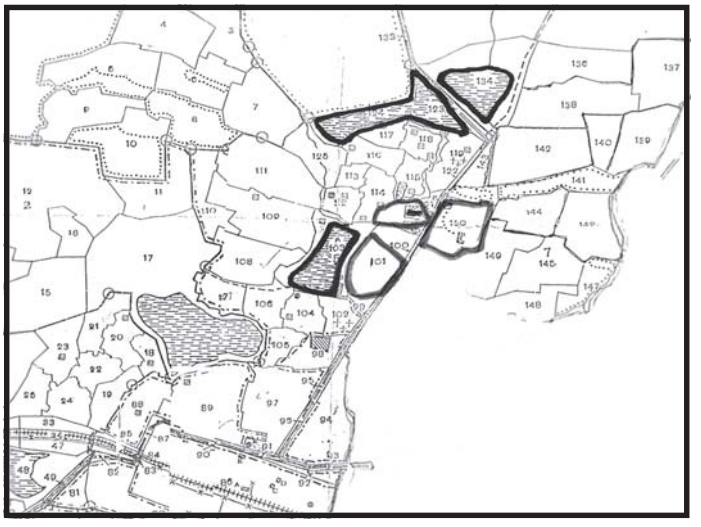
2. Appropriate techniques and crop rotation schedules;
3. Optimum use of local resources;
4. Maximum net profit;
5. Diversification of farming;
6. Balanced eco-system;
7. Food security without any toxicity;
8. Increase in employment;
9. Skills upgrade; and
10. Establishment of networks.

Activities	Year							
	2004–05				2005–06			
	I	II	III	IV	I	II	III	IV
Training			*	*	*	*	*	
Demonstration								
a) NADEP Compost				*	*	*	*	
b) Indori Compost				*	*			
c) Vermi Compost				*	*			
d) BGA *(blue green algae)*					*			
e) Bio-fertilizer					*			
f) Wheat							*	
g) Paddy					*			
h) Green Manuring					*			
i) Niger, Toria						*		
j) Pigeon Pea						*		
k) Green Gram						*		
l) Potato							*	
m) Cauliflower, Cabbage						*		
n) Tomato						*		
o) Chilly						*		
p) Satawar						*		
q) Madhupatra				*	*			
r) Ashwagandha						*		
s) Musali						*		
t) Varahikand						*		
Exposure Visit							*	

Time Frame

Budget

Activities	Total No. of Courses	Trainee Days	Rate *(Rs)*	Amount *(Rs)*
Training	**26**	**917**	**50 / day**	**45,800.00**
Demonstration				
a) NADEP	10 (Units)		5,920 / Unit	59,200.00
b) Indori	15 (Units)		2,980 / Unit	45,000.00
c) Vermi Compost	10 (Units)		4,300 / Unit	43,000.00
d) BGA *(blue green algae)*	6 (Units)		2,689 / Unit	16,134.00
e) Bio-fertilizer Lab	1 (Unit)		100,000/Unit	100,000.00
f) Wheat	2 ha		10,340 / ha	20,680.00
g) Green Manuring *(Sanail Dhaincha)*	5 ha		600 / ha	3,000.00
h) Paddy	5 ha		4,904 / ha	24,500.00
i) Pigeon Pea	2 ha		2,786 / ha	5,572.00
j) Green Gram	1 ha		2,961 / ha	2,961.00
k) Niger / Toria	2 ha		2,146 / ha	4,292.00
l) Potato	0.5 ha		30,000 / ha	15,000.00
m) Tomato	1 ha		13,610 / ha	13,610.00
n) Chillies	0.25 ha		14,010 / ha	3,500.00
o) Cauliflower	0.25 ha		15,410 / ha	3,850.00
p) Madhupatra	0.10 ha		446,400 / ha	44,600.00
q) Ashwagandha	0.25 ha		16,400 / ha	4,100.00
r) Sarawar	0.25 ha		15,410 / ha	3,800.00
s) Musli	0.05 ha		760,400 / ha	38,000.00
t) Varahikand	0.10 ha		35,300 / ha	3,500.00
Total (2)				**454,299.00**
Exposure Visit	2 (No)			**180,000.00**
Monitoring				**45,000.00**
Evaluation				**45,000.00**
Grand Total				**770,099.00**



Moravapalli and Kothapalli

Pulicherla Mandal, Chittoor District, Andra Pradesh, India

Site Development Plan

Prepared by: South Asia Rural Reconstruction Association (SARRA)

The project is located in *Morava Harizana* wada and *Kotta Palli* villages in *Pulicherla* Mandal of Chittoor district of Andhra Pradesh state, South India. The Chittoor district is bounded on the north by *Ananthpur* and *Cuddapa* district, on the east by *Nelloor* District, on the south by North Arcot district of *Tamil Nadu* State, and on the west by *Tamil Nadu* and *Karnataka States*.

The district covers 15,152 sq. km., with a total population of 3,745,875. Literacy rate (per 2003 census) is 66 percent, way above the State's rate of 60.5 percent. Major crops grown in the project area include rice, peanut, cereal, millets, and pulses.

Statistics/Figures

Table 39. **Village Profile**

Particulars	
Total Households	83
Total Population	333
Male Population	164
Female Population	169
Adapted Households	50
a. SC	40
b. BC	2
c. Others	8
Farmers' Status	
a. Land-less Families	9
b. Marginal Farmers	28
c. Small Farmers	13

Table 40. **Income of Farmers**

Status	Approximate Income of Farmers' Household *(US $/year)*		Approximate Income of Farmers' Household in the State *(US $/year)*	
	Rs.	$	Rs.	$
Land-less Farmers	17,472	416	35,000	833
Marginal Farmers	31,962	761	44,000	1,047
Small Farmers	42,000	1,000	60,000	1,428

Note:

- ***Project area farmers cultivate for only one season a year due to dry land and agriculture is dependent on monsoons.***
- ***In some parts of the state, farmers cultivate for two seasons due to irrigation facilities.***

Resource Assessment

Assets

Major resources of the project villages are dry land, livestock, common property resources like water bodies, vacant government. lands, housing sites, and manpower. Almost all of the project's farmers own houses and vacant plots planted to organic vegetables for family consumption.

About 41 families own dry land, which is totally dependent on monsoons and suitable for food grain production like pulses, peanut, and vegetables – which provide 30 to 40 percent of their food needs.

About 21 families depend on livestock production. Farmers sell cow's milk directly to the markets, and almost all use cow dung as fertilizer. Even landless families are into livestock rearing due to the availability of common property resources for grazing.

Structure and Process

The three-tiered system of panchyath institutions are functioning at the village, Mandal and district levels.

These institutions are responsible for the development of the communities by implementing government programs for education, agriculture, livestock development, provision of drinking water, housing, and minor irrigation programs. The local panchyaths play a vital role in implementing development programs and act as a bridge between government departments and the people.

Agriculture research stations, agriculture universities and agriculture extension departments play a key role in the dissemination of information and transfer of technology in the farming community.

Cooperatives and banks only extend limited financial support services to the farmers, forcing farmers to depend on money lenders to fund their agricultural inputs.

Vulnerable Conditions

- Agriculture is heavily-dependent on the monsoons;
- Monocropping is a serious issue;
- Lack of access to markets is a common problem in the area. Prices of agricultural products and livestock are very low, particularly during harvest season. As a result, farmers' incomes are sometimes even less than the input costs;
- Lack of effective farmers' associations in the area resulting in less bargaining power;
- Most of the agriculture products are sold to middlemen at bargain prices;
- Lack of value-added technologies for agricultural products; and
- The majority of the farmers are illiterate and have no access to information.

Associations and Networks

While farmers' associations are promoted at the village level, they need to be trained on Sustainable Agriculture polices and governmental laws. The agriculture department already started training farmers groups on Sustainable Agriculture practices, marketing, and pest control methods.

Current SA Technologies and Practices

At the end of the project period, *SARRA* aimed to introduce the following SA technologies for enhancing food security:

1. Soil and water conservation technologies

- Composting
- Biomass production
- Mulching practices
- Bunding
- Trenching
- Rainwater harvesting

2. Crop production improvement

- Seed
  a) Selection
  b) Treatment
  c) Production
  d) Preservation
- Crop rotation
- Intercropping
- Seed networking

3. Pest management

- Integrated pest management (IPM)
- Natural pest management (NPM)
- Biological pest management (BPM)

Past Agricultural Practices that Have Failed to Improve the Condition/ Increase Income of Farmers

During the past four decades, under the patronage of international development agencies as well as the national government, the area's farmers have been introduced to green revolution technologies such as hybrid seeds, chemical fertilizers, pesticides and other external inputs for securing higher production levels of various crops. Substantial incentives were offered by the national government to apply these tech-

nologies. Although farmers witnessed higher production levels in the initial stages, they could not maintain the same levels of production due to the decreasing fertility levels of the soil, as well as pest and disease problems due to the heavy application of external inputs.

Overall Strengths and Opportunities of the Project Site

Strengths:

- Almost all households depend on agriculture;
- Big cattle rearing, the by-product of which can be used as organic fertilizer; and
- The partner NGO, *SARRA,* has substantial experience in the area of sustainable development.

Opportunities:

- The agricultural sector in Andhra Pradesh is very much in crisis. Farmers recognize that unless they organize themselves and look for alternatives, it is highly impossible to come out of the crisis;
- The state government gives much priority and focus on agriculture. The government is very much interested in strengthening new interventions related to agriculture; and
- NABARD and other banks were also interested to support farmers' groups, if they fulfill their minimum required standards.

The Project Site Development Plan

Goal of the Project Site

The goal of the project site was "to make agriculture viable and remunerative to small and marginal farmers through Sustainable Agriculture practices and sustainable marketing interventions…".

Objectives

1. To enhance awareness, knowledge and motivation levels of area's families to function as demonstration farmers in the application of SA practices and technology transfer;
2. To enable the farmers to undertake practical demonstrations in order to apply SA technologies in the area of vegetable production for home consumption and marketing;
3. To enable the demonstration farmers to share their knowledge and experiences with other farmers and build farmers' networks for advancing the agenda of food security and Sustainable Agriculture; and
4. To document the experiences of the SA initiatives and its effects on income, employment and poverty reduction.

Operational Strategy

Since SARRA has more than 15 years of experience in working with SA networks in

different parts of India, it recognized the need to develop a small SA demonstration center so that capacity-building programs for farmers could be initiated. SARRA worked with 50 marginalized farmers who experienced several constraints due to the onslaught of green revolution technologies.

Aside from intensive interaction sessions at the village level and periodic consultations with women, youth and other sectors, the farmers also documented their community level experiences and wisdom related to various indigenous technologies.

The families were also given the opportunity to develop homestead nutrition gardens for year-round supply of vegetables for family consumption. They also collected, preserved and propagated valuable indigenous seeds.

The families also developed interactions with other SA farmers in South India and applied their learnings in both their home and farms. The farmers developed their networks with a view to continue their interaction with the other SA networks in other regions of the country.

Output and Indicators

1. Established a teaching and learning center for promoting Sustainable Agriculture practices in the region;
2. Developed the capacity of 50 farmers to undertake demonstrations in their home and farm environment, and thus help other farmers to recognize the need for SA initiatives;
3. Developed farmers' networks and strengthened linkages with other networks in the region for the continuation, consolidation, and multiplication of initiatives;
4. The cross cultural pilot program on SA initiative for achieving reduction in poverty levels set a new trend in the field of sustainable development and food security through farmer's initiatives;
5. The network building exercise helped eradicate various discriminatory practices associated with religion, caste, creed and untouchability; and
6. Replicated by farmers' organizations, NGO federations and Government Agencies.

Indicators

1. An organic model farm was established with all SA technologies;
2. Two self-help groups (organic farmers' group) were strengthened;
3. Farmers' incomes increased by approximately 15 percent; and
4. All 50 farmers adopted SA technologies in the area of vegetable production for home consumption.

Conclusion

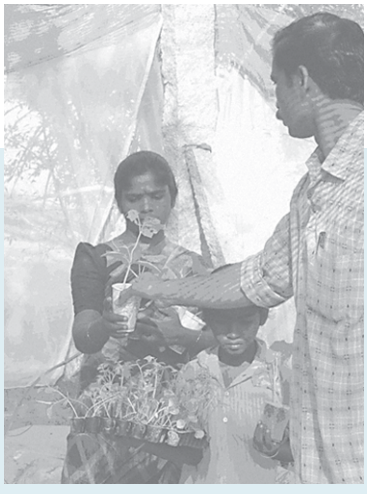
SARRA-AJPN project on Sustainable Agriculture for poverty reduction has added a new dimension in the local area.

Since the local community is under the stress and strain in the area of agriculture due to the onslaught of Green Revolution Technologies, the farmers in the pilot villages have taken a keen interest in Sustainable Agriculture experiments, notable of which is the introduction of Bio Intensive Nutrition Gardens.

Since the BIG is the foundation for advancing the SA Agenda, experienced SA farmers and scientists from different parts of south India played a key role in motivating the project's farmers through example and by recounting their experiences.

At the end of the project, the farmers realized that SA is the only way to provide a safe and bright future for the new generation, as well as achieve self reliance and food security.

The government, through the extension agency of the agriculture department, has started examining the need to introduce the SA dimension in their programs. Hence, the pilot program through farmer's initiatives provided new direction and hope for the future of small and marginal farmers.



Banjaroya, Banjarasri, Jatisarono, Pagerharjo, Giripurwo and Hargorejo,

Kulon Progo, Jogyakarta, Indonesia

Site Development Plan

Prepared by: World Food Day Secretariat (WFD FFD)

Kulon Progo regency is part of Yogyakarta Province and is located in the western part of Yogyakarta City. Kulon Progo is 90 percent mountainous area and is well known as *perbukitan Menoreh* (Menoreh hills).

In its few lowland areas, farmers can access irrigation facilities to cultivate rice for the first planting season. Soybean, peanut, corn, benguk (a kind of bean) and cassava are cultivated in the second planting season.

Since access to water for irrigation is difficult during the third planting season, farmers only maintain cassava crops which are planted within the second planting season to be harvested in the third planting season (dry season).

The majority of the land at the Sustainable Agriculture (SA) project site of Banjarasri village is planted to cassava and intercropped with corn, herbs, banana, coconut, and trees. While in Pagerharjo village, farmers concentrate on clove cultivation since it provides higher returns. The rest of their plots are planted to vanilla, coconut, spices such as ginger, and cassava.

Farmers in Giripurwo village plant rice during the first planting season and *kacang benguk* (kind of bean), also called *tempe benguk* or home industry. Through *tempe benguk*, farmers will enhance their income.

Table 41. **Farmers' Income**

Village	Approximate Income per Household *(US $/year)*	Approximate Income per Household in the country *(US $/year)*
Banjarasri village	578	666
Pagerharjo	657	
Giripurwo	551	

Source: ***baseline survey AJPN in Kulon Progo (2004) for farmer's household***

Statistical Background

Number of Farmers Involved

Initially, the project planned to cover seven villages because SPTN-HPS' role was to assist and facilitate World Food Day farmers in the Regency of Kulon Progo. After Asia-Japan Partnership Network (AJPN) visited and monitored the farmer's group preparation, they suggested that the work focus on three villages to be more effective. There are 25 farmers involved in the AJPN SA in each village, or a total of 75 farmers in three villages.

Resource Assessment

Assets of the Project Sites

A. Agricultural Aspect

Crop Cultivation

Banjarasri, Pagerharjo, and Giripurwo (just like Kulon Progo) areas are predominantly hilly. This kind of landscape dictates the kind of crops grown here. For long term investments, farmers plant perennial plants such as clove, cacao, mahogany, teak, and acacia. After five to seven years, farmers can start harvesting from the clove tree every year. Clove trees are also used to repair houses or for timber. For food, farmers cultivate corn, peanut, red chili, and vegetables that grow well during the rainy season.

As a source of raw material for the home industry, they cultivate cassava and herbs (ginger, turmeric, galangal, and others). Farmers also cultivate tropical fruits like rambutan, mango, durian. These they sell after their domestic needs are met.

In Banjarasri village, farmers have been applying LEISA (Low External Input Sustainable Agriculture) for crop production since 1997. Before LEISA, they used urea (900 kg/0.5 hectares). This then dropped to 75 kg per 0.5 hectares after they learned about Sustainable Agriculture.

In Pagerharjo village, Samigaluh subdistrict farmers have been practicing SA since 1992. While in Wadas Giripurwo village, farmers have been using SA since 1998.

Traditional Methods are Used for Compost Processing

The raw material consists of cow/goat manure and straws/leaves/trunks.

In three sites of the project, a lot of organic material like leaves, legume crops, cow dung are available for compost processing.

Climate

Samigaluh is about 900 m above sea level, so this site enjoys a relatively cooler climate than the others. Banjarasri is about 700 m above sea level, while Giripurwo is about 400 m above sea level.

Like most parts of Java, the rainy season starts October and ends in April. Strong winds are present in August.

Physical-agricultural Infrastructure

Most of the irrigation canals in many sites are traditional. In Samigaluh, farmers use water more for domestic consumption than for farming. Baseline data showed that in Pagerharjo village, upland irrigation reached only 54 hectares. In Giripurwo village, lowland irrigation reached 36 hectares while upland irrigation is at around 860.27 hectares.

B. Economic Development Aspect

Kulon Progo area is well known for snacks made from cassava. Like most parts of Kulon Progo, farmers also make local snack from cassava in these three sites.

Income earned from home industry is used to pay for: (1) children's school fees; (2) capital investment: (3) health care; home repairs. Most children have finished high school and several have graduated from university.

Farmers sustainable consumption pattern are also implemented through alternative foods like taro, corn, and yam. They also grow vegetables for their household needs.

To overcome health problems, farmers grow traditional plants in their home garden where they produce medicinal herbs such as ginger, turmeric, white turmeric, galangal, and pepper battle leaves.

They also maintain traditions such as: '*Wiwit*' and *Merti Desa*. *Wiwit* is thanking and praying to the Gods before harvest, while *Merti Desa* is thanksgiving after harvest.

In October 2004, the group of Ngudi Makmur in Banjarasri village and Pagerharjo village were also visited by participants in the SEA Farmer conference hosted by SPTN in collaboration with APHD (Asia Partnership for Human Development, based in Bangkok).

Participants from Southeast Asian countries, like the Philippines, Thailand, Cambodia, and Indonesia shared their experiences and knowledge on Sustainable Agriculture and marketing.

Structures and Processes

The local government in the three project sites wholeheartedly supports Sustainable Agriculture.

In Banjarasri village, they provide a revolving fund to raise goats in order to augment farmers' incomes and produce more organic fertilizer.

The local government of Banjarasri always reminds farmers during meetings that they should develop and use organic fertilizers since they understand the negative effects of using chemical fertilizers on soil fertility.

The government supports AJPN's intervention to augment farmers' incomes through Sustainable Agriculture.

In Pagerharjo village, local authorities facilitated farmers' meetings on selling of agricultural products aimed at stabilizing prices.

The village has long been used as a demonstration plot for NGO research, and also for cross-visitation programs on food security and development of alternative food sources. Taro, yam, and others alternative food sources are cultivated in farmers' gardens.

The local government ecourages women's groups to set up small savings and loan facilities, and gave them an initial capital of Rp 600,000 in 1997 (USD 60) – which has now risen to Rp 2,600,000 (USD 270). Women use this capital for their "enting-enting jahe" business.

In Giripurwo village, the local government is very supportive of agriculture development. They encourage farmers to grow *kacang benguk*, a local snack.

A. Cooperatives

Pagerharjo Village

There are five cooperatives that support farmer's activities in the village. To access credit from the cooperatives, farmer should meet requirements such as: (1) joining the group; and (2) setting-up a small business.

Giripurwo Village

There are four cooperatives that provide credit to members with interest rates of 1.5 to 2 percent a month. Period of return is 5 to 10 months.

Banjarasri Village

There is one credit cooperative named *UB Mekar Bhakti* that gives credit to its members with interest of 1.5 percent a month. Period of return is 10 months.

B. Agricultural Laws and Policies

The local government in Kulon Progo's motto is *ijo royo-royo*, which means encourage the community to establish Kulon Progo as a green area with diversified crops.

The district government demonstrated their commitment to this motto by supporting farmer's activities in Sustainable Agriculture development.

In October 2004, the farmers' forum of *Sabar-subur* (World Food Day farmer's movements in Kulon Progo established in 1999) celebrated World Food Day in Promasan Kalibawang sub-district. The regent came and encouraged farmers to develop alternative food products. Farmers also sold their organic products to the regent and his staff.

Vulnerability Condition

Hindrances met by farmers in Kulon Progo:

1. Lack of knowledge and access technology weaken farmers' condition and position. In the three project sites, farmers do not clearly understand the materials used in organic fertilizers and methods of organic pest management. In all the three project sites, farmers' groups do not plan their activities well, i.e., they did not carry out proper bookkeeping and business management practices. This caused their enterprises to grow very slowly or even stagnate, thus farmers in this village remain poor.

2. Lack of water for irrigation, particularly in Banjarasri village. During the dry season, farmers have to get water for domestic consumption two kilometer from their houses.

3. Lack of market access was a common problem for most of the farmers in the three project sites. The prices of the agricultural products and home industry products are quite low, particularly during the harvest season, resulting in low incomes.

   In Giripurwo village, for instance, farmers use 5 percent of their harvest to make *tempe benguk*, a local snack made from beans. The remaining 95 percent is sold to middlemen at cheap prices (approximately Rp 1,500 to 2,000/kg or 0.15-0.2 USD). In Banjarasri village, the price of cassava and snacks made from cassava during harvest season (August) is approximately Rp 2,000/kg. Sometimes it can rise to Rp 5,000/kg.

   In Pagerhajo village, the price fluctuations of raw materials, like ginger, coconut, millet and white sugar, influence the profit earned by the farmers' group who are into the *Enting-enting Jahe* business.

4. Lack of networking among farmer's groups in each site of the project has weakened the farmers' bargaining position. This condition resulted in farmers losing out when determining prices for their produce and in fighting for their rights.

Associations and Networks

World Food Day farmers' groups in Kulon Progo have collaborated with institutions/NGOs that advocate for farmer's rights so as to create opportunities to improve their condition and position.

They established an agricultural product network to sell organic rice and other products with Satu Nama Foundation based in Jogjakarta, gain access to credit cooperatives, and inquire from the village government about Sustainable Agriculture policies.

These farmers' groups also held World Food Day celebration every October to thank God for the success of their harvest for the current year and hope for a better harvest the following year.

The celebrations also run concurrently with a bazaar for organic agricultural products. They also conduct farmers' workshops on relevant issues regarding Sustainable Agriculture. Usually the group invites the head of the district (regent) to give the opening remarks and hold dialogues with farmers.

At the end of the meeting, they make resolutions to solve problems and disseminate information to the media and government to advocate farmer's rights.

In Banjarasri village, there are five farmers' groups working on nurturing Sustainable Agriculture. In Pagerharjo village, there are three farmers' groups and in Giripurwo village, there are two farmers' groups involved in promoting SA agriculture.

Mostly at the village level, there are community groups that have a long history of communal activities.

- **PKK:** Formed in Java in 1979, the PKK women's group exists in most villages of Kulon Progo. This group, whose membership is 100 percent women, aims to empower women on family and child care, increase their business skills, upgrade their knowledge, and other related issues of human development. They have meetings every month. Many issues are discussed during the meeting, such as: dissemination of information from the district government relating to healthy life, environmental preservation, savings and loan, and others.
- **Cooperatives:** There are many cooperatives established in each village. These support farmers in running their farming enterprise and meeting their daily needs, such as pay electricity, provide family health care, help defray cost of their children's education.
- **Salawatan group:** Formed in 1999 in Pagerharjo village, Salawatan is a traditional folk song group which aims to revive and maintain local culture and practices and encourage the younger generation to embrace local culture. The group composes traditional songs that encourage people to conserve the ecosystem and maintain diversity of crops.

Current SA Technologies and Practices that are Promoted and Have Addressed Poverty of Farmers

1. SPTN-HPS has promoted Sustainable Agriculture in Kulon Progo sub-district since 1991 in Wates (the head city of Kulon Progo) mostly through World Food Day activities. After one year, a farmer's group was put up in Pagerharjo, Samigaluh sub-district Kulon Progo and one farmer's group

in Girimulyo village that implement SA. They cultivated local rice varieties and applied organic fertilizer on their fields. They later found out that their soil became more fertile, thus sustaining their SA activities to date. From 1996 to present, there are 14 farmer's groups involved in the World Food Day farmers' movement in Kulon Progo. All of them adopted Sustainable Agriculture practices.

2. The promotion of Sustainable Agriculture matches the farmers' needs since they feel that overuse of chemical fertilizers and pesticides has killed the soil biota and is hazardous to human health. They gradually abandoned chemical inputs and converted to organic inputs.

   Some technological aspects of SA that have been introduced to the farmers include: use of local seeds varieties to replace hybrid seeds, use of organic compost to replace chemical fertilizers, and use of biological pesticide to control pests and diseases.

3. SPTN-HPS has strategies to address poverty through several aspects of Sustainable Agriculture, as follows:

   a. Pattern of production through:

   - ❖ Promotion of local seed varieties such as: local rice, corn, soybean, and cash crops in order to replace hybrid or even genetically engineered seeds. Use of local seeds reduced cost of production so the farmers choose this strategy in their agriculture enterprise.
   - ❖ Technical assistance and training on organic fertilizer and organic pest management practices. To control pest and disease, the SA farmers in Kulon Progo use organic pesticide. Through SA assistance, the farmers have converted from chemical to organic fertilizer. This reduced cost of production and enriched the soil's fertility.
   - ❖ Promoting farmers to conserve biodiversity in nature to maintain ecosystem balance.
   - ❖ Increased sustainable production of food and snacks.
   - ❖ Set standard of production process.

   b. Pattern of consumption

   - ❖ Encouraging farmers to consume healthy food
   - ❖ Promoting simple lifestyle referred to as the truth, justice and peace.

   c. Alternative economy

   - ❖ Savings and loan group as an embryo to establish credit unions (CU).
   - ❖ Home industry development
   - ❖ Organic product marketing

Past Agricultural Practices that Have Failed to Improve the Condition/Increase Incomes of Farmers

1. After the Green Revolution, farmers were so dependent on high external inputs such as hybrid seeds, chemical fertilizers and pesticides thus resulting in negative effects on soil fertility and productivity. The loss of local rice varieties, traditional wisdom and

agricultural culture are also felt because reduction in soil productivity simultaneously reduced their income.
2. Onerous agricultural trade policies continue to marginalize poor farmers. Farmers have no bargaining position with middlemen, since there are no clear-cut policies to protect them.

Overall Opportunities and Strengths of the Project Site

1. Farmers are organized under World Food Day farmers' group networks, which is a strong base for the farmers to advocate for their rights.
2. Farmers started practicing Sustainable Agriculture five to 10 years ago, thus their soil is more fertile and productive. Their productive soils have simultaneously reduced their operations costs (for buying chemical fertilizers) and increased their income.
3. Farmers have started home industries to process sustainable agricultural products so as to increase the product's value, making them more marketable and able to demand a bigger price.
4. Farmers have a strong desire to be successful. This was evident to the team from AJPN which monitored their activities in December of 2004.
5. The government is supportive of Sustainable Agriculture development because they know its positive impact to the agricultural ecosystem and farmers' income.
6. Many businesses are interested to collaborate in the selling of organically soorced snacks like cassava and *enting-enting jahe* (ginger snack)

The Project Site Development Plan

Goal of the Project Site

Enhanced capacity for Sustainable Agriculture to reduce poverty in the three sites and in the whole of Kulon Progo.

Objectives

1. Increase knowledge and skills of farmers on Sustainable Agriculture cultivation and processing of snacks made from the farmers' produce;
2. Increase income of farmers from their home industries; and
3. Strengthen networking among farmers' and consumers' groups.

Strategies

1. Sustainable agriculture:
   a. Set up organic model farms in each farmers' group.
   b. Establish biological pesticide processing – *in-vitro* processing practices in each site.

2. Rural economic development:
   a. Set-up marketing teams per site to strengthen market access.
   b. Promote organic farmers' products the consumers.
   c. Strengthen farmers' home industries per group through packing, labeling, and quality control practices.

d. Strengthen cooperatives in each farmers' group through training and capital development.

3. Establish routine coordination activities/meetings among farmers' groups to discuss problems and find the best solutions.

4. Conduct on-site training to increase farmer's technical skills and knowledge in the areas of:
   a. Integrated pest management, composting, cash crops' seeding.
   b. Home industry management and development (include packing, labeling, and marketing).

5. Conduct exposure trips to other successful groups to learn about production processes, post harvest processing, and marketing.

Outputs and Indicators

1. Each farmer's group established organic model farms to convince their members to go organic. There are at least three organic model farms in three sites of the project that were established by 50 farmer-members.

2. There are five farmer experts in each farmer's group who are now capable of making biological pesticides (encouraging natural enemies to control pests) and to teach other farmers.

   In the three sites, there are 50 farmers who are skilled to practice in their respective SA fields and can teach other farmers within their villages.

3. There is a marketing team in each site, who strengthen the group's market access and network to sell organic products.

4. There is one home industry established and well managed in each site. The three home industries in the three sites will benefit 20 farmer-members a site.

5. There is one strong and well-managed cooperative in each site of the project. Three well-managed cooperatives will benefit 60 farmer-members.

6. There are routine meetings among farmers' groups in each project site.

7. Farmers' incomes increased by 25 percent.

Conclusion

1. A medium for community/farmerss learning was established, through: organic model farms and home industry enterprises. The model is chosen to create alternative learning strategy from farmer to farmer (farmer as teacher and learner) farmers/community will share, learn, and extend Sustainable Agriculture practices.
2. Capacity of farmers was increased, whereby they are now capable to implement Sustainable Agriculture practices in their respective villages manage their organization and enterprise as well.
3. Established marketing teams to expand market access to ensure that farmers' products are sellable.
4. Strengthened home industries in each site which are adopted and practiced by each member.
5. Assisted farmers' groups in implementing Sustainable Agriculture practices.

Banjarnegara, Punggelan and Paseh Sub-Districts

Propinsi Jateng, Indonesia

Site Development Plan

Prepared by: Sekretariat Bina Desa

Banjarnegara district's total area is 106,971 hectares. Irrigated land is 16,168 hectares while non-irrigated land covers 90,803 hectares.

There are 18 sub-districts and 278 villages within Banjarnegara District, with a total population of 838,962.

There are eight peasant groups involved in the project living in the three villages, namely: Banjarmangu, Punggelan and Paseh. Inclusion in the project was primarily based on the farmers' willingness to participate, and was done during the socialization and preliminary assessment stages.

Table 43. **Features of the Project Site**

Description	Banjarmangu	Punggelan	Paseh
Major Crops	rice, zallaca (fruit), cassava, banana	rice, zallaca, cassava, cucumber, banana, red ginger, albasia, teak	rice, zallaca, cucumber, hot pepper, albasia, teak
Farmer Groups	1. Ngudi Lestari 2. Sri Rejeki 3. Ajining Tani 4. Ngudi Makmur 5. Ngudi Rahayu	1. KUB Arum	1. Bakti Lestari 2. Ngudi Rejeki
Number of Peasants Involved in the Project	31	10	40

Table 44. **Household Annual Income in the Three Villages**

Description	Amount *(IDR)*	Amount *(US $)**
Average of Farm Income		
a. Cash	4,548,809	535
b. In kind	456,740	54
c. Sub-total	5,005,549	589
Average of Non-farm Income *(cash)*	7,662,541	901

** exchange rate: 1 US$ = 8,500 IDR*

Statistical Background

Profile of Farmers

The three villages have 81 households, with a total population of 421 (48 percent male and 52 percent female). The average number persons per household is four, while the average age of respondents is 38.

In relation to enhancing soil fertility, it seems that farmers prefer three kinds of sustainable practices, namely: mulching, composting and animal manure.

About 65 percent of farmers used animal manure, followed by 16 percent who use mulching, and 10 percent do composting.

In addition, 25 percent of the farmers use chemical fertilizers and lime, mostly for paddy cultivation.

Only 16 percent of farmers use IPM (integrated pest management) methods which involves applying chemical pesticides whenever there is an attack from pests and diseases. As for cropping patterns, 72 percent of farmers adopt sustainable agricultural practices such as polyculture, crop rotation, multi-storey cropping and intercropping. Only 12 percent of the farmers adopt monoculture, which is mostly practiced in paddy cultivation.

At least 31 percent of household rely only on farming for their income, while 51 percent derive their income from a combination of farming and non-farming sources. The rest are engaged in non-farming activities such as trading, carpentry or construction, and as employees (teachers and local government personnel).

Resource Assessment

The Assets of the Project Site

The main crops cultivated by the farmers in this area are paddy, cassava, zallaca palm, tomatoes, long bean, cucumber, and hot pepper. Some farmers also grow teak and albasia. The soil in the villages is fertile because of its proximity to volcanoes.

Only a few farmers in the three villages have any experience in organic and LEISA practices, and only for crops such as tomatoes, rice, hot pepper, long bean, and mustard. As for the fruit crops (zallaca and bananas) and cassava, all farmers in the areas have never used chemical fertilizers and pesticide after planting.

Banjarmangu village is well known as a producer of snack foods such as TORAMA (tomato tasty date), cassava and banana chips, and flour products.

In Paseh or Punggelan village, many households raise cattle, goat, buffalo and poultry for additional income, which is a good and easy source of animal manure for producing compost.

Most irrigation systems for paddy lands are still traditional. About 50 percent of land relies on rain-fed irrigation.

Structure and Process

Farmers' organizations in the area have good relations with the district government and were very much willing to support Sustainable Agriculture development in Banjarnegara District.

In previous years, the district government requested farmer organizations, especially in Paseh village, to provide compost products in large quantities.

Unfortunately, the farmers' organization were not ready to fulfill this requirement. The district government even invites farmers' groups to participate in agricultural exhibitions at the district and provincial level.

An agricultural laboratory of the Agriculture Ministry, located in Purwokerto District (aprox. 90 minutes from Banjarnegara city), is also available for farmers.

UNSUD (Sudirman University), based in Purwokerto city, can provide agricultural information and consultation services for farmers. Some agricultural experiments of UNSUD are carried out in Banjarnegara District.

A branch of BRI-Bank Rakyat Indonesia (a state bank) located in Banjarnegara district gives micro-finance to farmers' groups in Banjarmangu village. The amount of credit varies from IDR 300,000 to 1,000,000 (US$ 36 to 118) and at an interest rate of 10 percent a year. Credit is delivered through the farmers' groups.

Vulnerability Condition

- About 50 percent of the land is rain fed, which affects rice production. In fact, during the dry season, rice production is down to only half the usual production;
- Prices of SA products are higher than conventional agricultural products in order to compensate for lower yield over the first three years. Unfortunately, the market in Banjarnegara district does not yet appreciate SA products;
- Some farmers are wary of shifting to SA due to their long dependence on chemical fertilizers and pesticides;
- Price of fresh agricultural products always fluctuate;
- Lack of knowledge about soil ecology management; and

- Four farmers' groups were already involved in related projects prior to the start of this project. However, the empowerment approach is quite different from the Bina Desa approach.

Associations and Networks

A few of association and networks are able to support SA technology in the three villages:

- IPPHTI (Association of IPM Farmer in Indonesia) – provides technical assistance on SA
- API (Indonesia Peasant Alliance) – with links to the agriculture ministry in Jakarta
- KRKP (People Committee of Food Sovereignty) – able to forward the issue of food sovereignty

Current SA Technologies and Practices that are Promoted/Practiced and Have Addressed Poverty of Farmers

Sekretariat Bina Desa has been introducing the SA concept and practices to farmers in Banjarnegara District since 2002, such as:

- "Ideological" Sustainable Agriculture;
- Promotion of the use of local varieties;
- Production of organic fertilizers and bio-pesticides by using existing local resources;
- Integrated Pest Management; and
- Enhancing the added value of SA products (such as processing organic tomato into a tasty date product)

Food processing and marketing capacities in the promotion of SA technologies and practices should be considered. With an integrated approach, an increase in farmers' incomes from Sustainable Agriculture is more realistic.

Past Agricultural Practices that Have Failed to Improve the Condition/Increase Incomes of Farmers

In order to achieve self reliance in food, the government pushed agriculture production by encouraging farmers to use hybrid varieties and high chemical fertilizer and pesticide inputs. This led to a decrease in soil fertility and environmental destruction. Incomes of farmers have also grown smaller due to the high cost of chemical inputs.

Indonesia is a WTO member-country. Consequently, the country's farmers no longer receive subsidies while farmers in developed countries still get the subsidies from their governments.

Overall Opportunities and Strengths of the Project Site

Bina Desa has organized the farmers in Banjarnegara District in 2002 within the SA framework. Several farmers' groups have emerged as a result of these efforts.

Women in the three villages are very enthusiastic about SA, particularly in making value added products to augment their household. Recently, farmers have started growing red ginger used as raw material for making *enting-enting jahe* (ginger snack).

Slegreng, a local upland rice which can be harvested in 105 days in Punggelan village has a high yield of three tons a hectare via the LEISA method, making this local

variety the answer to the issue of food sovereignty.

In terms of SA practice, Paseh village is a promising area due to the abundance of raw materials and resources. For compost production, for instance, Paseh has an abundance of animal manure. It also has more people engaged in the AJPN project, a lot of green manure, the know-how to make EM4-5, and abundant flower growth.

Although there is an order to supply around three tons of compost, the villagers agreed to supply the local (village) market first.

In the three villages, the farmers' groups have a semblance of a savings and credit program. Although small in terms of volume, this program strengthens the solidarity among members.

The Project Site Development Plan

Goal of the Project

The goal of project is the reduction of poverty in the selected areas by enhancing the capacities of rural communities to increase agriculture productivity, decrease input costs and increase household incomes through the promotion of SA practices.

Objectives

1. Promote and make farmers understand why SA practices are important;
2. Explore and disseminate local SA practices;
3. Increase household income by encouraging women to engage in processing activities; and
4. Advocate policy change with the district government in order to include SA into the mainstream agricultural program.

Strategies

Opportunity	Strategy
Several farmers' groups exist	❖ Sekretariat Bina Desa facilitated the establishment of an umbrella farmers' organization primarily for SA practices
Good response from the government	❖ Kept communication lines with the local government open ❖ Invite local government in training programs
Women interest in food processing activities	❖ Conducted training on food processing and packaging. ❖ Conducted training on cost and benefit analysis and simple bookkeeping. ❖ Conducted training on marketing. ❖ Provided exposure trips to other food processing enterprises. ❖ Provided revolving fund for capital.
Upland rice	❖ Seeds were propagated and promoted to other rainfed areas.

Strategies *(continued)*

Opportunity	Strategy
SA practices	❖ Management of soil ecology. ❖ Compost produced by farmers was analyzed for chemical and microorganism content. ❖ Training of Integrated Farming System included cattle fattening and production of biogas from waste materials. ❖ Provided revolving fund for capital.

Outputs

1. Formation of an umbrella farmers' organization;
2. Got the commitment of district government to help in SA development;
3. Strengthened the capability of women to produce marketable food products;
4. Replicated Slegreng Upland rice to other rainfed areas; and
5. Increased household income by 20 percent.

Budget

Description	Budget		Note
	IDR	US$	
Preparation of Site Development Plan			
Group Meeting			
Accommodation	850,000	100	
Subsidy for Transport	3,400,000	400	
Incentive for Facilitator	1,700,000	200	
Board Meeting			
Board Coordination Mtg.	425,000	50	
Accommodation	425,000	50	
Food Processing Trial	0	0	Community's contribution

Budget *(continued)*

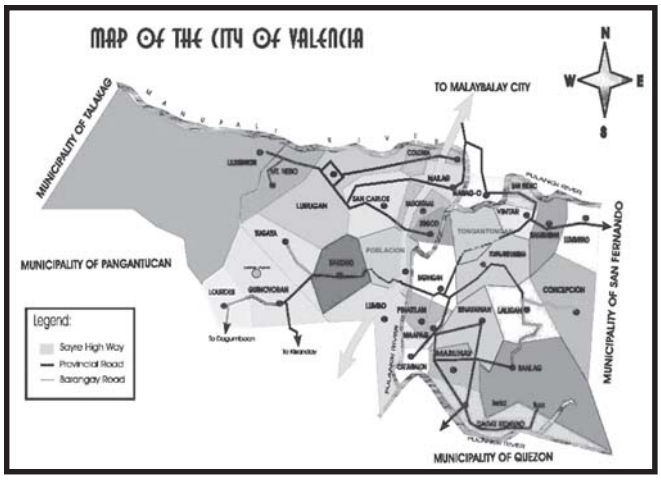
Description	Budget	
	IDR	US$
Upland Rice Trial	0	0
Training		
Management of Soil Ecology	8,500,000	1,000
Food Processing and Packaging	7,500,000	882
Cost-Benefit Analysis and Bookkeeping	5,000,000	588
Marketing		
Integrated Farming System	10,000,000	1,176
Analysis of Compost Product	10,000,000	1,176
Exposure Trip	8,500,000	1,000
Revolving Fund		
Compost Enterprise in Paseh	25,000,000	2,941
Food Processing Enterprise in Banjarmangu	10,000,000	1,176
Food Processing Enterprise in Punggelan	10,000,000	1,176
Organics Shop	17,000,000	2,000
Monitoring	6,000,000	706
Documentation	10,000,000	1,176
TOTAL	**134,300,000**	**15,800**

Note: ***exchange rate US$ 1 = IDR 8,500***

Conclusion

Many SA programs encountered difficulties in expanding their impact because the approach was too technical.

Based on this experience, this project adopted the integrated approach and attacked the issue on several fronts, namely: (1) development of SA techniques; (2) establishment of links with government, NGO and other service providers; (3) increasing the capability of human resources marketing support systems.



Bgys. Sinayawan and Tongantongan

Valencia City Bukidnon, Philippines

Site Development Plan

Prepared by: Philippine Partnership for the Development of Human Resources in Rural Areas (PhilDHRRA)
and Organic Rice Industry Technical Working Group (ORI-TWG)

Valencia City is considered the rice granary of Bukidnon, Central Mindanao, Philippines with 10,370 hectares of irrigated agricultural lands in the lowlands and 510 hectares in the uplands that produce a combined 108,000 metric tons of rice every year.

Due to favorable weather conditions in Bukidnon and the abundance of water for irrigation, the city projected a production surplus for rice until 2010.

However, excess rice production has not been translated into the increase in income of farmers because of the increasing prices of production inputs, especially fertilizers.

Chemical companies have established a strong presence in Valencia City precisely because of its gift of producing huge volumes of rice.

The use of chemical and synthetic form of agriculture inputs was heavily promoted, thus causing irreversible damage to the environment and human health.

This prompted groups like the Philippine Development Assistance Programme (PDAP), Sustainable Agriculture Center, Kaanib Foundation and the City Government of Valencia City to promote Sustainable Agriculture, encouraging farmers to use environment friendly technologies in rice farming like the use of organic fertilizer, use of locally available plants to control pest and diseases.

Organic Rice Production

At least six peoples' organizations are sustaining the production of organic rice.

The entry of the Asia Japan Partnership Network in Poverty Reduction in 2004 has strengthened the implementation of organic rice farming in Valencia City as it identified 75 farmers (22 are women and 53 men) in

the villages of Sinayawan[3] (21 farmers), Tongan-Tongan (26 farmers) and Kahaponan (28 farmers) as the project beneficiaries.

These farmers have a combined 125.65 hectares of land, of which 61.05 hectares are planted with organic rice while 54.70 hectares is planted with in-conversion rice.

In 1998, there were seven types of post harvest facilities scattered throughout the three identified villages. Most common post harvest facilities in the area were rice threshers, solar driers, corn mills, rice mills, warehouses, corn shellers and organic fertilizer plant.

Transportation in the three villages is not a problem considering that the area is only 15 kilometers from the city and farm to market roads traverse the three villages. Jeepneys, hauling trucks, motorcycles serve as the primary means of transportation in these areas.

Although there were no training facilities that could accommodate large number of participants, each barangay has its own barangay hall used as a venue for seminar and training.

In Tongan-Tongan, the local group Tongan-Tongan Organic Farmers Society for SA (TOFSSA) has a small training center constructed by the Sustainable Agriculture Center. Irrigation facilities were also available in the three villages.

The People and Area of Production

Prior to the implementation of the AJPN project in these villages, farmers were already organized and practice organic farming and SA, making it easier to step up organic production programs.

Their formation was facilitated by NGOs who were also the prime advocates of organic rice farming.

In Sinayawan, there were two organizations into organic farming, the Makakabus and BMFMC or the Bukidnon Masipag Farmers Multi-Purpose Cooperative.

Two organizations are based in Tongan-Tongan (Tongan-Tongan Organic Farmers Society for SA and the Tongan-Tongan Multi-Purpose Cooperative) and two in Kahaponan (AFARBAMCO and Kahaponan Multi-Purpose Cooperative). Seventy-five (75) of their members were identified as AJPN beneficiaries.

The six organizations have a combined production area of 272.04 hectares. Of this, 72.55 hectares of rice farms used organic technology; 45.2 hectares used LEISA technology while 154.29 hectares were being farmed in conventional way.

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[3] Since the Bukidnon Masipag Farmers Multi-Purpose Cooperative is based in Sinayawan, 6 farmers are incorporated in Sinayawan although they are living in the adjacent villages of Paitan and Mabuhay.

Average production was estimated at 92.5 cavans (50 kilograms) a hectare.

Structures and Process

In 1997, the Philippine Development Assistance Programme (PDAP) implemented its Promoting Participation in Sustainable Enterprises (PPSE) in partnership with the Social Action Center of Malaybalay.

The partnership of PDAP and the Social Action Center has facilitated the organization of Makakabus and the establishment of the organic fertilizer plant.

Kaanib Foundation, a local NGO in Bukidnon has also entered the two adjacent villages in the city, bringing also its expertise in organic farming.

The Xavier University-Sustainable Agriculture Center (XU-SAC) and the Social Action Center of Malaybalay were instrumental in the formation of the Bukidnon Masipag Multi-Purpose Cooperative.

In 2003, XU-SAC in partnership with the Tongan-Tongan Barangay Council formulated the Community Base SA Master Plan for Tongan-Tongan, which outlines the 10-Year Development Plan of the village. It also conducted training and seminars on Sustainable Agriculture and Systems on Rice Intensification (SRI).

The Local Government Units of Valencia has also actively promoted organic farming in the city. Through the City Agriculture Office (CagO), the city mobilizes its 24 Agriculture Technicians to provide technical assistance to farmers.

It also provided organic fertilizers and funds for the conduct of the Farmers' Field School (FFS) and the School on the Air as part of its extension work. It also provided free soil analysis to farmers so that proper nutrient recommendation will be provided.

The Department of Agrarian Reform (DAR) has also provided organic fertilizers to the farmers in Tongan-Tongan and Kahaponan in the form of soft loan.

Such a strong support from NGOs and the active participation of the farmers and the local government unit provided fertile ground for the further development of Sustainable Agriculture practices in the city.

The entry of AJPN played a big role in this development as it was instrumental in shifting the agriculture policy of the city.

The Local Government in cooperation with the farmers' cooperatives and NGOs has agreed to declare the city as the "Organic Rice Capital of the Philippines".

Subsequently, the City Council approved the City Ordinance No 03-2005 creating a Task Force Organic to formulate and implement the SA and Organic Rice Master Development Plan.

This policy declaration presented an opportunity to mainstream and upscale rural community initiatives in Valencia City and produce healthy food while protecting the environment and its agricultural resource base.

It is hoped that this initiative will spur local economic growth and provide increased local employment. It is also hoped that this

initiative will increase competitiveness of the local rice industry and prepare local communities to the impending negative impact of the inclusion of rice in the international trade under WTO.

Vulnerabilities

There are some pressing issues, however, that hinder the implementation of Sustainable Agriculture and organic rice farming in Valencia City. One of these is the land tenure problem.

Rich families own large track of lands in the area. These families also known as landlords who provide farmers with readily available assistance during emergency and credit for production.

When these lands were distributed through the Comprehensive Agrarian Reform Program (CARP), this assistance was cut off. Although government has provided capacity building and infrastructure support, little has been done to address the economic needs of these CARP beneficiaries.

Due to lack of capitalization coupled with family needs, some of the distributed lands were rented or leased out to other farmers and traders who later managed the farm. Land leases or rental averaged between PhP 150,000.00 to PhP 200,000.00 over three years.

This scheme limited the introduction and expansion of SA and organic rice farming in the area. All decisions must come from the current manager (lessee) of the land. To encourage the introduction of organic rice farming, both the new owner and the maintainer should be convinced to go into organic.

During lean season (usually from land preparation until the months before harvest), farmers need financing to support or their family needs such as food, education and other providential needs.

Conventional and hybrid farmers can easily look or financial support since government has available financial assistance for them, unlike organic rice farmers. Though traders and private businessmen served as alternative sources of capital and finances for family needs, they also charged exorbitant interest that ranges between 10-20 percent a month.

Marketing support for organic rice farmers was also limited. Of the six organizations assisted by the AJPN, only two were into organic rice trading in partnership with either a marketing group or NGO.

The Makakabus has a marketing contract with the Bukidnon Organic Products Corporation (BOPC). With this agreement, BOPC purchase the organic rice of Makakabus farmers at a guaranteed price plus other incentives ranging from PhP 0.20 to PhP 0.70 a kilogram.

The Kaanib Foundation also assists the AFARBAMCO in the marketing of their organic rice. Kaanib provides incentive of about PhP 0.20 a kilogram.

Other farmers that do not have marketing agreements with BOPC and Kaanib have to sell their organic products individually or to private traders that provide no incentives and do not recognize their product as organic.

Associations and Networks

The six organizations under the AJPN program are currently promoting SA and organic farming in partnership with the different organizations and networks.

Makakabus for example is linked to the Philippine Development Assistance Programme, (PDAP) Inc., and the Bukidnon Organic Products Corporation (BOPC).

PDAP has been assisting Makakabus since 1997 during the implementation of its Promoting Participation in Sustainable Enterprises (PPSE) program. It provided capacity building, marketing and financial support to start its organic rice trading project.

PDAP also provided financial support to its previous partner Social Action Center of Malaybalay in the establishment of organic fertilizer plant in Sinayawan, which stands as the only commercially operating organic fertilizer plant in the area.

BOPC, on the other hand, is the primary buyer of organic rice of Makakabus and been marketing organic rice since 2000 using the brand name Nature's Bounty.

The product is available in major shops and supermarkets in Cagayan de Oro City, Iloilo, Dumaguete and Bacolod cities. It regularly ships organic rice to Manila through the Upland Marketing Foundation, Inc that markets organic rice using the Healthy Rice brand.

The Organic Rice Industry Technical Working Group under the Philippine Partnership for the Development of Human Resources in Rural Areas (PhilDHRRA) has assisted

Makakabus in the development of their Internal Quality Control System (IQCS) Manual as pre-requisite for their application for organic certification.

IQCS is a system that safeguards the integrity of organic quality of the products. It plays a vital role in ensuring that the organic products specifically the organic rice will be categorized as purely organic or in-conversion.

Therefore, farmers will understand the importance of organic agriculture and will know the benefits they could get as organic implementers.

The Kaanib Foundation has assisted the Araneta Farmers Beneficiaries Multi-Purpose Cooperative (AFARBAMCO) based in Kahaponan since they started organic rice farming in the 1990s.

It was instrumental in the conversion of the AFARBAMCO and the Kahaponan Multi-Purpose Cooperative (KMPC) members into organic rice farmers. They provided training to the two organizations.

It later concentrated its technical and financial assistance to AFARBAMCO leaving KMPC on its own. In the early implementation of organic rice farming with AFARBAMCO, Kaanib provided production support to farmers, deductible after harvest.

The credit support was later transferred to Bukidnon Cooperative Bank (BCB) after Kaanib and BCB signed a Memorandum of Agreement to support the production needs of AFARBAMCO.

Kaanib provides a PhP0.20/kilogram purchased from the members of AFARBAMCO as incentives for the continuous support in the promotion of the organic rice industry.

To consolidate its effort in the Bukidnon Province, Kaanib has organized a federation of organic farmer cooperatives that includes AFARBAMCO. It is now processing the registration of the federation. An IQCS was already installed and ready for application for organic certification.

The organizations based in Tongantongan including the members of the BMFMC have been assisted by the Xavier University-Sustainable Agriculture Center (XU-SAC) since early 1090s. XU-SAC claimed to have trained more than 2,000 farmers in SA.

They assisted the village of Tongantongan developed their 10-Year Comprehensive Sustainable Agriculture Development Program that outlines the vision, mission, goals and objectives of the village to help them realize their aim of promoting Sustainable Agriculture in the area. It also established a cooperative center that serves as venue for on-farm training in Tongantongan.

While training on SA and organic rice farming has been continuously done, demonstration farms were also established to showcase organic farming technology and the new initiative in rice production, the Systems In Rice Intensification or SRI.

The Department of Agrarian Reform (DAR) is the government agency mandated to distribute land to landless farmers. It is the lead agency in the implementation of the Comprehensive Agrarian Reform Program (CARP).

In Valencia City, DAR implemented projects like farm-to-market roads, training and communal irrigation system. In 2004, they distributed organic fertilizers to agrarian reform beneficiaries in Kahaponan and Tongantongan.

The Local Government Unit of Valencia City through the City Agriculture's Office (CAgO) was also actively participating in the promotion of SA and organic rice farming. It

provided financial support to XU-SAC and the Village Council of Tongantongan in the development of their COMBASE and the training of farming on SA.

The declaration of the city as the Organic Rice Capital of the Philippines has provided CAgO to take the lead in the realization of this vision. As initial activities, it identified 500 hectares to be converted into organic rice farms.

The city government provided a guarantee fund of PhP 20M to Quedancor, a government credit and guarantee corporation to support for the conversion of 500 hectares.

SA Technologies and Practices

The entry of different NGOs (PDAP, Kaanib and SA Center) facilitated the introduction of different Sustainable Agriculture practices in the three villages.

Foremost is the organic rice farming that introduced the use of environment friendly technology such as organic fertilizer, herbal sprays for the control of pests and diseases in rice and other crops.

During the implementation of PDAP's PPSE program, the Diversified Integrated Farming Systems (DIFS) was also introduced, especially crop and livestock integration.

The rice-duck technology, where ducks are integrated, as part of the farm has been successful, however implementation was short lived because of the cost of ducklings. Rice-fish system was also introduced in Tongantongan and Kahaponan. Some of the rice-fish farms still exist in the area. Recently, Korean Natural Farming and Biodynamics (another forms of organic farming) were introduced. Makakabus for example is now using Fish Amino Acid (FAA), Fermented Fruit Juice (FFJ) and Indigenous Micro-organisms (IMO) and other concoctions that serve as soil conditioner and alternative to the commercially available and synthetic fertilizers.

The study conducted by PDAP in 2003 of the Makakabus experience in the production of organic rice revealed that it generated an income of PhP 10,155.00 a hectare or 48 percent net profit compared to the income of PhP 2,542.00 or 10 percent net profit generated by farmers for one hectare of conventional rice.

Recently, the National Irrigation Administration (NIA), a government agency that supports the irrigation needs of rice farmers and SA Center introduced the Systems in Rice Intensification to be integrated in the organic rice farming.

Demonstration farms are being established to showcase the system.

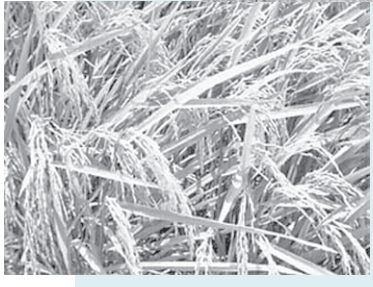
Farmers have taken to organic farming practices as they have realized that their incomes have not improved despite agricultural productivity enhancement programs such as the Green Revolution, Masagana in the 70's and most recently the GMA Hybrid Rice Program in 2000.

Rather, these have put them into heavy financial indebtedness. For the farmers, hybrid is not sustainable.

With the entry of AJPN, the villages of Sinayawan, Tongantongan and Kahaponan, local government units, government agencies, NGOs the private sector and the farmers' organizations worked closely together to show what Sustainable Agriculture can do to improve the farmers' lives.

Over the past two years, farmers were trained, new systems of organic farming were introduced and 125 hectares of rice farms were converted into fully organic or in-conversion farms.

More importantly, marketing support was given to at least 75 organic rice farmers in Valencia City and they have now put Bukidnon on the list of main sources of organic rice, which means that Valencia City is earning its right to be named the Organic Rice Capital of the Philippines.



The AJPN project concentrated on helping the farmers reduce production costs, sustain production yield, ensure the availability of the market and provision of incentives and appropriate technical support.

This was done by training the interested farmers on season-long organic rice production and refresher courses on organic rice production.

Exposure trips to other areas in Mindanao practicing organic rice and biodynamic farming were organized to inspire the farmers to follow in their footsteps.

To further bolster the program proponents' objectives, organic rice demonstration farmers were set up to showcase the Variety Adaptability Trial (VAT) and Rice-Duck or Fish Technology.

The VAT aims to test promising rice varieties from other areas to the locality. Varieties with high yield potential and resistance to pest and diseases can be mass-produced and can be utsed by farmers in the succeeding cropping.

To support the organic rice production, the AJPN assisted the Diocese of Malaybalay in upgrading the existing organic fertilizer plant in Sinayawan.

While the project assisted the diocese in the upgrading of the organic fertilizer plant, AJPN also trained farmers to for-

mulate their own organic fertilizer using locally available materials.

Technologies learned from exposure trips like formulation of Fish Amino Acid (FAA), Fermented Fruit Juice (FFJ) and Indigenous Micro-organisms (IMO) as alternative sources of fertilizer, soil conditioners and food supplements were encouraged.

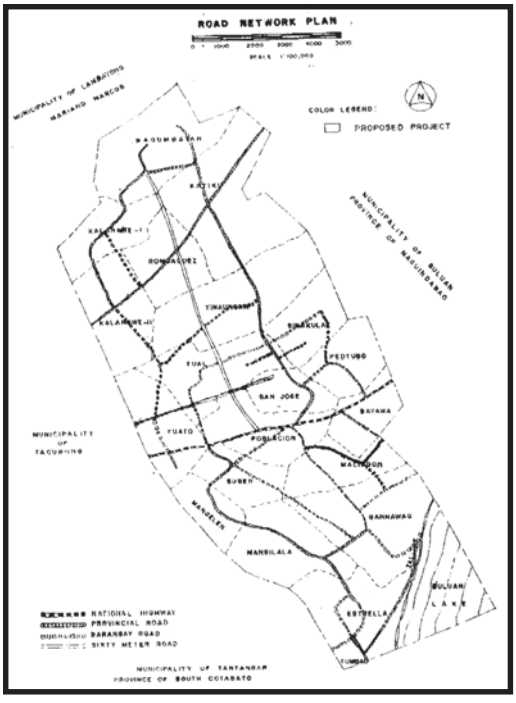
The project's success would also not have been possible without the production assistance given by the local government unit and the Bukidnon Organic Products Corp., which helped look for buyers of the farmer beneficiaries' organic rice.

BOPC provides incentives to farmers ranging from PhP0.20-PhP0.70 a kilogram above the prevailing market price of palay. This incentive is expected to encourage farmers to continue practicing organic rice farming. The marketing assistance covers at least 75 hectares of organic and in-conversion farms in the three villages.

A central processing facility for organic rice was likely established in Valencia City to cater to the increasing organic rice farmers. This was also in line with the Local Government's efforts to declare Valencia as the Organic Rice Capital of the Philippines.

Results show that at the end of two years, AJPN has made a difference in the lives of the farmers here.

Income has been increased and the results are encouraging enough to make one believe that the farmers will continue what they started and make Valencia City a showcase for successful organic farming.



Brgys. Tuato and Tual

Pres. Quirino Sultan Kudarat, Philippines

Site Development Plan

Prepared by: Philippine Development Assistance Programme, Inc. (PDAP)

Consumers in the Philippines and around the world are slowly but surely developing a taste for healthy, natural food.

One product that is benefiting from this trend is muscovado, defined as a non-centrifugal sugar or unrefined raw sugar obtained from sugarcane juice through the process of evaporation and draining off of molasses.

And when it comes to muscovado, Sultan Kudarat in Mindanao is showing great potential to benefit from the growing demand for the product.

Several muscovado mills are operational in Sultan Kudarat, particularly San Pedro and San Emmanuel in Tacurong City. These are operated using technologies that were acquired from their forefathers. Even the equipment that most of them use was handed down from generations.

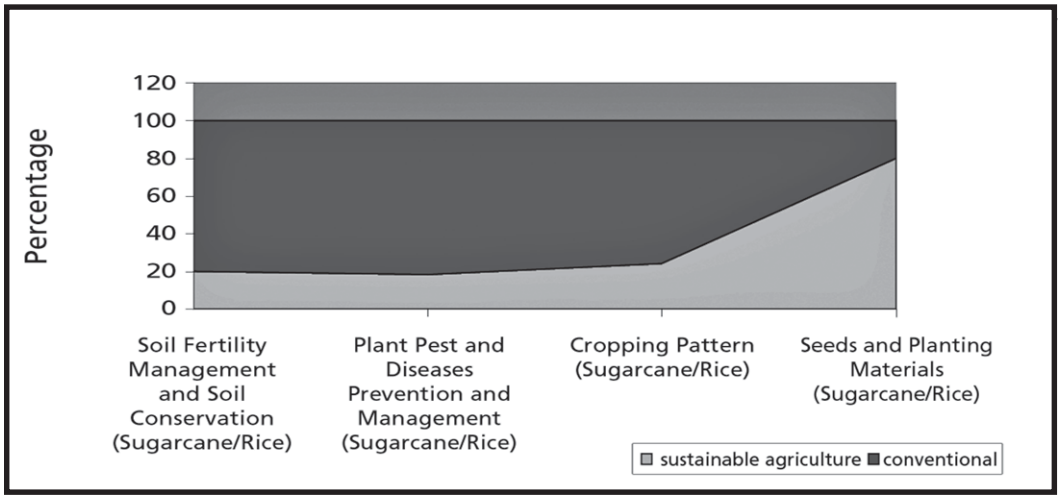
But a shift is happening and the muscovado industry here is stirred to look for ways to strengthen itself to compete in the local and international market.

Muscovado might again have the opportunity to become a "sunrise industry".

This is where The Asia-Japan Partnership Network for Poverty Reduction (AJPN)-Philippine Development Assistance Programme (PDAP) Project for Muscovado in Sultan Kudarat comes in.

The project covers three barangays: Tuato and Tual and San Emmanuel. Tuato and Tual are located at the municipality of President Quirino and San Emmanuel is located in Tacurong City. The Municipality of President Quirino and Tacurong City are within the Province of Sultan Kudarat.

Figure 10. **Farming Practices by AJPN Target Beneficiaries (SA vs. Conventional)**



A total of 75 farmers were involved in the project. 41 of 118 farmers in barangay Tual, 29 of 43 in Barangay Tuwato and five of eight sugarcane farmers in Barangay San Emanuel, Tacurong City.

Barangay San Emmanuel was given priority due to the small number of sugarcane farmers and muscovado producers in the area. They were included in some trainings and other activities to cater to the needs of sugarcane farmers in the area.

There are currently 271 farmers in Barangay Tual, of which 118 are sugarcane farmers. Barangay Tuato has 381 farmers, of which 43 are into sugarcane. Barangay San Emanuel of Tacurong has 239 farmers and only eight are sugarcane farmers.

Baseline survey showed that as much as 80 percent of the farmers were into conventional farming in terms of soil fertility management and conservation (sugarcane/rice), prior to the project and only 20 percent were adopting SA.

The majority or 81.3 percent were also into conventional method in terms of plant pest and diseases prevention and management. The data also showed that the majority of farmers in the area were into monoculture.

Some 76 percent of the farmers were into conventional while only 24 were into SA. Seeds and planting materials, on the other hand, showed the opposite. The majority or 80 percent were into SA while only 20 percent were into conventional method.

Average annual income in Mindanao was PhP 96,978 *(NSCB 2000 Data).*

Baseline survey showed that sugarcane farmers and muscovado millers for "Farm Income" had an average income of PhP 25,742 a year in terms of cash and PhP 97,177 a year in terms on non-cash (This does not include other sources of income).

The farmers in Sultan Kudarat, thus, earn more than the average farmer in Mindanao. This can primarily be attributed to the

equitable sharing scheme of Muscovado producers in Sultan Kudarat.

Sultan Kudarat had the raw materials needed to leapfrog into organic agriculture, especially in sugarcane.

Most muscovado millers in the area have their own sugarcane plantations. With the millers control over sugarcane production, they are assured of the steady supply of raw materials.

The project site also boasts of 21 muscovado mills. Out of the 12 owned by private individuals, only one is owned by a cooperative (San Pedro Sugarcane Planters MPC).

Then there was help that came from the Archdiocesan Center for the Development of Communities (ACDC) Foundation under the Order of Notre Dame (OND), which had existing training facilities for cooperatives and associations.

Sultan Kudarat Polytechnic State College (SKPSC) and Notre Dame of College of Tacurong (NDTC) also had available training facilities but training services was largely limited to entrepreneurial and business development.

Muscovado and Other Sugarcane By-products

Traditionally, sugarcane farmers tend to produce by themselves the naturally milled sugar popularly known as muscovado, or sliced (candied muscovado) and/or vinegar out of the yield.

During harvest, the farmers deliver their canes using a "kariton" or carabao cart and/or trailer to the mill. There is no truck scaler in the area to measure the actual volume of ton canes harvested per hectare.

The farmers determine their income based on the milled muscovado using ganta and/or "kawa" as basis for payment, which in turn sell it to local traders (or landowners/mill owners).

The product was then further distributed to various outlets in at least five areas, which include Zamboanga, General Santos City, South Cotabato, Bukidnon and Pagadian.

Support Groups

There are three people's organizations in every barangay that support farming/ agricultural activities, namely, the Women's Association or Rural Improvement Club (RIC), Poorest Among the Poor, and a Farmers Cooperative.

The Local Government Units are also quite supportive to the project. However, major

focus of LGU's in Sultan Kudarat, particularly in President Quirino and Tacurong is on hybrid rice, hybrid corn and Palm Oil.

The Archdiocesan Center for the Development of Communities (ACDC) Foundation under the Order of Notre Dame (OND) has been assisting farmers cooperatives and associations in Sultan Kudarat.

ACDC is currently producing Organic Fertilizers for the use of farmers that are into Sutainable Agriculture farming.

Technology

While muscovado production is a traditional industry in Sultan Kudarat, it has not prospered because technology has been largely unchanged since it was first introduced centuries ago and handed down through generations.

The same is true with equipment as most millers inherited these from their forefathers or bought them from other old hands in the business.

Most people are resistant to change, including farmers. Many prefer to hold on to traditional practices for fear of failure when new technologies are introduced.

Such barriers to innovations have prevented farmers from improving the sugarcane production technology.

Most farmers are also using conventional inputs to sugarcane production. Prices of conventional inputs are increasing year after year which greatly affected the return of investments of farmers.

As the farmers' return on investments and profit become smaller, they will eventually become poorer and end up entangled in the vicious web of poverty.

Government programs have not helped improve production. Previous efforts, for instance, saw the introduction of plant varieties that were either not applicable to communities or required too much capital for inputs.

Government programs have also overlapped in many cases and were not complementary. As a result, there was replication of programs and activities.

Associations and Networks

There are organizations, however, that have been helping bring about significant change in these barangays.

In Barangay Tual, there are four people's organizations, namely, the Women's Association with 40 members, Poorest Among the Poor with 15 members, San Pedro Sugar Planters MPC with 43 members, and the Parent-Teacher Association with 94 members.

Along with the presence of these barangay–based organizations are several social projects, which are currently being implemented in the barangay. This includes livestock raising, which started in 2004, benefited a total of 55 beneficiaries. The muscovado marketing, also started in 2004, involves 21 beneficiaries.

Among the organizations in the village, the San Pedro Sugarcane Planters MPC (SPSPMPC), established on February 6, 2001 is the pride of the barangay.

External supports from multi-donors have been poured much to the PO in the forms of financial assistance and support services. Despite these, the coop went through many failures in its business and organizational aspects due to mismanagement of the previous officers, which consequently caused division among the members.

The cooperative, however, survived its growing pains and has been recognized for its effort to improve muscovado production, which is the members' main source of livelihood. It has also attracted more investors and development projects related to the establishment of muscovado industry in the area.

Inspired by such developments, some inactive members went back with enthusiasm. The new set of officers also committed to devote the time and energy needed to run the cooperative smoothly and efficiently.

The coop, however, had no involvement with SA projects except milling accommodation to muscovado producers (non-SA). Note that the mill has an average daily capacity of four (4) "kawas" (140-160 gantas), accommodating one to two millers on a first-come first-serve basis.

The coop is strictly implementing policies for regular millers. Chance millers are refused but are advised to register first at the millers' list one week before harvesting.

They have also been recipients of various capability building training provided by multi-development stakeholders. Right now, the coop's assets acquisition increased from PhP 612,886.54 in 2001 to PhP 832,908.95 in 2002. However, the capital build up showed zero movement during this period, which maintained a record of barely PhP 16,250.00.

Barangay Tuato

There are about four associated groups or organizations in barangay Tuato, two of which are women's organization, the Women's Poor - Poorest, which has 33 members, and the Rural Improvement Club (RIC), which has 35 members.

The other two organizations are the Tual Carabao Breeders Association, which boasts of 19 members, and the Farmers MPC with 57 members. These organizations are all based in the barangay.

Hand in hand with these existing affiliations are social projects intended for each organization. The RIC has been a recipient of swine and goat raising projects since April 20, 2004. The Women's Poor-Poorest started its goat raising production on Feb. 7, 2004. The Poorest Among the Poor has been a recipient of carabao dispersal on Feb. 15, 2001.

The Farmers MPC (FMPC), which was established on March 20, 1996 is different from other groups because of its business and service to all members. Both landowner and tenant members are given equal access to its credit services (consumer store and agricultural inputs).

The coop has employed two sales clerks and a manager (for the consumer store) and a production manager (for the muscovado).

The board of directors is composed of the chair, vice and three members, while the general assembly has an aggregate membership of 57 active and regular farmer-members, most of whom are male.

The coop is not engaged with SA projects, and is limited to running the consumer store and providing agri-supply services to its members. It also gives dividends and patronage refunds to its members every year.

SA Technologies and Practices

The farm is located at the semi-lowland area and the farmer rotates between planting corn and sugarcane. During the rainy season, the area can not be planted with corn, which is only suitable during semi- dry season. The choice of crop usually depends largely on the weather.

Due to the increase in prices of farm inputs, most farmers in the area have started to practice LEISA.

Farmers with sufficient funds to purchase farm inputs however, continued to farm the conventional way.

Conventional Farming practices common among traditional farmers, however, have been driving them towards the depths of poverty mainly because the increase in costs has outpaced the corresponding increase in income.

Opportunities and Strengths of the Project Site

The desire to break free from the bonds of poverty made the farmers here mainly receptive to the idea of adopting Sustainable Agriculture techniques.

To spread the gospel on Sustainable Agriculture, farmers cooperatives were tapped to help the farmers as farmers have faith in these groups.

The millers were also allies as they act as the middlemen in production and the buying of sugarcane in the community.

Farmers often request an advance from their "suki" millers to purchase farm inputs and during harvest, the latter also purchase the whole product and sells them to their contact muscovado buyers.

The millers in the area are very influential in terms of suggesting necessary changes in production technology.

The traditional compensation "sharing" system of the sugarcane production in Sultan Kudarat is also quite peculiar than other farm production sharing system. The compensation between labor and land owners is 50/50 after deducting all related expenses.

This system in Sultan Kudarat is very much equitable than in any farm practices and regions throughout the country.

In this situation, assisting the landowners is also tantamount to assisting the laborers in the community.

The Project Site Development Plan

PDAP-AJPN intervention for the Muscovado in Sultan Kudarat, thus, can be described as an integrated approach where marginalized farmers were not the only ones given due focus.

Millers and landowners were also taken into account as part of the solution to reduce poverty in the community.

Due to the peculiar situation in the community and the equitable sharing system, millers are likely to lead the journey of reducing poverty in the community.

PDAP Intervention was not limited to enhancing agricultural productivity through Sustainable Agriculture, but included Muscovado Processing Technology and Establishment of backward and forward linkages as well.

The strategy was aimed primarily at increasing the production of *muscovado*, to cater to a *niche* market in the context of a declining sugar industry and of the Philippine agriculture sector, in general.

Another aim of the this strategy is to shift to increase the production of *organic* muscovado sugar, to position the product at a *growing export market* and obtain *premium prices* for such.

Finally, the aim of the strategy is to improve the trading and marketing of organic muscovado, the challenge includes improving *international competitiveness and product positioning* in terms of product quality through good manufacturing practices and organic standards.

A packaging, branding, and market positioning aimed at organic niche market will allow producers to gain access to higher market prices.


chapter
V

Preliminary Impact Assessment Report and Conclusions

Initial Project Results

A quick survey was conducted in the first part of 2006 to make an initial assessment of progress in the six project sites.

Four indicators guided the quantitative documentation of the project experience: yield, production cost, labor inputs, and product selling price.

While it is too early to assess the actual impact of the project, the results of the survey could serve as indicators of the potential effect of Sustainable Agriculture on farm income.

And the results have been encouraging, further bolstering AJPN's firm belief that Sustainable Agriculture practices can lead to increased income and bigger yields, contrary to popular belief.

With Sustainable Agriculture, Yield Increases Over Time

Selected crops in four project sites have shown significant increases in yield.

Rice, the staple food and the common crop among the project sites, responded favorably to natural farming technologies.

Rice yield per hectare increased significantly from 7–10 percent in three of the four project sites that promoted sustainable rice production.

This was largely due to the use of organic fertilizers and reduction in the use of chemicals for pest control.

In the case of Bukidnon, infestation caused a slight decrease in production, yet the harvest remained at par with conventional rice harvests in the area.

The other major crops in project sites in India, such as wheat, pea and tomato, also showed significant increases in yield.

The farmers attributed this performance, especially of pea and tomatoes, to the greater use of organic fertilizers and new seed varieties. Integrated pest management was another common practice in the pro-

Table 45. **Yield Per Hectare of Rice and other Crops Before and During the Project**

Crop	Yield Per Hectare *(kg)*		% Difference	Project Site
	Before the Project	During the Project		
Rice	6,124.60	6,591.18	7.08%	Parmalpur
	4,551.06	4,932.46	8.38%	Banjarnegara
	2,105.42	2,330.34	10.70%	Jogyakarta
	4,063.95	4,049.00	(0.37%)	Bukidnon
Wheat	3,115.57	3,470.44	10.23%	Parmalpur
Pigeon Pea	803.70	1,274.96	58.64%	Khamkalan
Tomato	14,822.22	20,034.13	35.16%	Khamkalan
Cassava	13,989.39	14,029.05	0.28%	Jogyakarta
Corn	3,122.73	4,131.48	32.30%	Jogyakarta
Lima Bean	825.00	858.33	4.04%	Jogyakarta

duction of these crops. Corn production in Jogjakarta registered a high increase in production, despite the 44 percent reduction in the use of chemical inputs.

Meanwhile, a slight increase in production was observed in cassava, to which smaller amounts of chemicals and more organic fertilizers were applied.

Lima beans, which were mostly produced in home gardens during the project, have become an additional source of income for households, given their much improved yields.

Overall, the shift to Sustainable Agriculture resulted in increased yields. Yields are expected to improve even further as soil fertility is progressively enhanced through the application of organic fertilizers.

Production Cost Increased Following the Shift to Sustainable Agriculture

The Project had hypothesized that production costs would be drastically reduced following the shift to Sustainable Agriculture. The Project, based on initial results, recorded the opposite effect.

Most of the project sites reported higher production costs during the project, except for Bukidnon (rice) and Jogyakarta (lima bean), which recorded lower production costs by 17 percent and 24 percent, respectively.

The other sites spent 4-30 percent more on production with the shift to Sustainable Agriculture.

Table 46. **Production Cost of Rice in Selected Sites Before and During the Project**

Project Site	Production Cost* per Hectare		% Difference
	Before the Project	During the Project	
Parmalpur	17,294.08	21,285.42	23.08%
Banjarnegara	2,465,788.46	2,916,288.46	18.27%
Jogjakarta	237,342.11	267,526.32	12.7%
Bukidnon	12,090.51	10,028.53	–17.05%

** in local currencies*

The increase in production cost was particularly attributed to the use of organic fertilizers. Specific reasons cited include:

- Most farmer beneficiaries are still learning how to make use of local resources, such as cow dung, as organic fertilizers. In the last cropping, most of them relied on organic fertilizers sourced outside the village, which cost more.
- Farmers who prepared their own organic fertilizers spent more as they had to pay people to collect local materials.
- Bigger volumes of organic fertilizer are required to meet the nutrient requirements of degraded farmlands.

These experiences revealed that it is probably not possible to reduce production costs immediately following the shift to Sustainable Agriculture.

However, a gradual decrease in costs is expected as the soil regains its fertility and thereafter requires less organic fertilizer.

In Bukidnon, for instance, where many of the beneficiaries had been engaged in sustainable rice farming for over three years, a significant decrease in production cost was already noticed.

It is also important to note that major increases in production costs were due to the labor-intensive nature of most non-chemical farming practices.

While this appeared as an added cost to farmers, it in turn benefited farm workers in the community in particular, and the local agricultural economy in general.

Except for rice production in Bukidnon, and tomato production in Khamkalan, which incurred lower costs, labor costs of the other crops went up 2-45 percent.

Organic Products can Command Higher Prices but Require Appropriate Marketing Strategies

While products of Sustainable Agriculture already command higher prices in most places, rural consumers, who are generally not fully aware of the benefits to be had from consuming them in lieu of chemically

grown food, are still not prepared to pay more for them.

Only three of the six project sites had made a deliberate attempt to market their products.

The marketing of muscovado sugar produced in Sultan Kudarat and of organic rice from Bukidnon, Philippines are the more notable examples of such efforts.

The other crops, which had also been produced without chemicals, had not been marketed as such and are currently priced no differently from conventional food items.

The experience of farmers in Sultan Kudarat showed that upgrading product quality and establishing better market linkages have a positive effect on price.

Initial investments in muscovado processing justified the price increase, and yielded a net return on investment of 15.3 percent.

Also, organizing the suppliers (millers/traders/farmers) and linking them with reliable buyers (NGOs/Foundations engaged in the marketing of non-chemically grown products) has stimulated demand for muscovado in the area.

Notes on Documenting Project Results

This initial assessment has been limited to quantifiable economic results. This does not suggest, however, a bias or indifference to other results.

In fact, in surveys conducted at various stages of the project, including pre- and post-implementation, the project had consistently tried to measure the impact on health, gender, social and community institutions, and the farm environment, among others.

The demand-driven approach to identifying interventions, which the Project had adopted, also helped ensure that all aspects

Table 47. **Labor Cost in the Production of Rice in Selected Sites Before and During the Project**

Project Site	Before the Project		During the Project		% Difference
	Labor Cost per Hectare*	% from Total Production Cost	Labor Cost per Hectare*	% from Total Production Cost	
Parmalpur	6, 000.00	34.69%	8,173.33	47.26%	36.22%
Banjarnegara	1,292,307.69	52.41%	1,723,076.92	59.08%	33.33%
Jogjakarta	154,117.65	64.93%	188,823.53	70.58%	22.52%
Bukidnon	7,601.23	62.67%	2,633.00	26.26%	–65.36%

** in local currencies*

Table 48. **Comparison of Processing Cost, Price and Income Per Unit of *Muscovado* in Sultan, Kudarat, Before and During the Project**

	Before the Project	During the Project	% Difference
Processing Cost	31,289.64	51,339.44	64.08
Volume	5,182.98	5,942.80	14.66
Processing Cost per Unit	6.04	8.64	43.10
Price/Unit	29.00	35.14	21.17
Income per Unit	22.96	26.50	15.41

regarded as important by the beneficiaries were covered by the project.

Unfortunately, the volume of information generated in the course of project implementation would have hampered any attempt to make a comprehensive account of project results.

The short duration of the project—less than two years—had also made it unnecessary to make such an attempt early on. It takes more than two years to measure the impact of an agricultural project.

Nonetheless, project surveys and interviews with beneficiaries had all indicated that there has been some progress towards agricultural resource conservation, enhancing social cohesion in the community, and improving the management capacities of beneficiaries.

At the same time, the project concedes that the method it has used to measure the economic benefit to beneficiaries needs to be made more scientifically rigorous.

Factors other than yield, cost of production and selling price come into play and determine the profitability of the effort.

For instance, the record indicates that in general, yields in all of the six project sites had increased following the shift to Sustainable Agriculture.

The results contradict earlier research, which indicates that farm productivity tends to dip in the transition period, rising progressively thereafter as soils recover from the overuse of chemicals.

There is a need therefore to determine which other factors, perhaps previously unaccounted for, had led to the unexpected rise in yield in the project sites.

A similar study is called for to find out why production costs in the project sites had increased following the transition to Sustainable Agriculture, rather than simply putting it down to the added labor requirements, even though previous studies have offered corroborating evidence to back up this observation.

Despite these limitations, the results lead to one conclusion: it is viable for farmers to shift to Sustainable Agriculture practice. Yes, there will be some major adjustments needed both in mindset and farming techniques to effect such a shift.

But the effort will be worth it as Sustainable Agriculture will not only eventually lead to higher yields and lower production costs, it will also bring in long-term benefits, such as environmental protection and community collaboration, that conventional agriculture will never be able to do.

Lessons and Challenges

Sustainable Agriculture as a Tool for Poverty Reduction

The project has demonstrated the potential of Sustainable Agriculture for raising farm productivity while keeping inputs to a minimum.

While labor costs had increased in many of the project sites, the case of Bukidnon, where farmers had been engaged in sustainable farming for some time, showed that labor costs could eventually be reduced as well.

On the other hand, the initial increase in labor requirements had proven to be beneficial to the communities as it created jobs for the many unemployed rural workers.

The premium prices for natural or organic products had also contributed significantly to increasing farm incomes.

But poverty constitutes not only material want but other forms and levels of impoverishment as well—psycho-social, gender, ecological among others.

Hence, while the project had given priority to the attainment of household food security—over increasing aggregate food supply, for instance—because it regards food security in the home as indispensable to poverty alleviation, it had also sought to encourage farmers to make their own decisions.

Conventional, or chemical, agriculture may have raised farm productivity to impressive levels, giving farmers more disposable income in the process.

However, by prescribing a strict regimen for things like which varieties to grow, how to control pest infestation, among others, conventional agriculture had also stripped farmers of the right—and the need—to make decisions for themselves.

This form of dependency has impoverished farmers socially and psychologically.

Sustainable agriculture in general has the potential to halt and reverse this pattern of psycho-social impoverishment.

Aside from seeking to tailor the type of crops and farming systems to the agro-climatic conditions in the area, Sustainable Agriculture also takes into consideration the socio-economic conditions of the farmers.

Within the project, in particular, it was emphasized that while yield or productivity is an important gauge of performance, other indicators of performance were also emphasized, such as resilience to external shocks, access to markets, and enhancement of technical capacity.

Farmers' participation is central in all these processes as it enhanced the farmers' sense of ownership of the project, and has improved the chances of it being sustained beyond the project life.

On the other hand, while Sustainable Agriculture requires less external input, it requires time to enhance farmers' capacities. It is knowledge intensive.

Investments would have to be made in training extension workers, in incorporating Sustainable Agriculture in academic curricula and in allocating budget for researches.

Engaging the Market

The increasing demand for organic products favors the mainstreaming of Sustainable Agriculture.

However, engaging the market imposes strict requirements on producers, specifically in terms of volume, reliability of supply, consistency in product quality, and packaging.

This presents a major challenge to small and marginal farmers who cultivate small parcels and produce little surplus. They need to consolidate their products and reduce transaction costs to be able to compete in the market.

A number of challenges and limitations which have bedeviled other attempts to market organic products had confounded project efforts to build market linkages as well.

Some of these are:

1. **Lack of needed financing.**
   As producer/farmers groups get ready to market their products, they will need financial assistance. Much of the currently available financing for agriculture is earmarked for production. Farmers looking to market their products would be focusing on product processing and promotion, rather than production.

2. **Lack of clear and enforceable certification standards.**
   While there have been notable attempts by governments to establish formal certification standards and systems, these have not been implemented quickly or broadly enough. The proliferation of products falsely labeled as "organic" tends to crowd out new, legitimate entrants into the organic food business.

3. **Lack of a marketing system tailored to support Sustainable Agriculture.**
   The infrastructure that supports the trade in and marketing of agricultural produce was and still is tailored to the requirements of conventional, chemically grown products. A new system, one which takes account of the unique processing, storage, and even packaging needs of organic producers, must be established.

Sharing the Benefits of Sustainable Agriculture

In the 2005 UN Human Development Report, it has been stressed that extreme inequality is a break on progress towards the Millennium Development Goals.

It argues that economic growth alone will be insufficient to enable most countries to achieve the goal of halving poverty by 2015.

Thus, equal emphasis should be given to creating conditions under which the rural poor can increase their share of benefits from greater farm productivity.

One approach that had been initiated by the project is to strengthen local development planning, specifically through the formulation of master plans for organic products that have significant potential in local and export markets.

As many governments in Asia have started to devolve agricultural functions to local government units (LGUs), this initiative provides an opportunity for more participatory agricultural development and hopefully more equitable sharing of the benefits.

Under such master plans, the LGU could facilitate the consolidation of organic products from small farmers by setting up a common framework and program for participation by the various stakeholders in the locality.

These master plans can also be the basis for formulating business plans which the private sector can jointly implement.

Another approach being implemented by other NGOs is the "industry approach", which consists of organizing and linking emerging rural enterprises in the value chain of production, post harvest processing and marketing.

Consolidating their products would help the farmers attain economies of scale, while linking their products in the value chain would enhance their competitiveness in the market.

The key strategy in both approaches is to increase farmers' productivity and competitiveness while strengthening their bargaining ability to ensure that they get their rightful share.

Both approaches also promote better coordination among participating stakeholders, avoid duplication of efforts, and would hopefully promote greater efficiency in transactions.

As such, they result in greater competitiveness, not only for individual stakeholders but also for the sector or the community as a whole.

Just as importantly, these approaches enhance transparency and facilitate better information management. Thus, they help ensure that the benefits are fairly distributed among the stakeholders.

Challenges and Action Points

The project has identified the following challenges to more widespread adoption of Sustainable Agriculture:

1. There is a need to refine the principles and methods of Sustainable Agricul-

ture according to a framework for poverty alleviation.

2. Social and behavioral changes within a community that has adopted Sustainable Agriculture must be documented. Empirical measures of its impact on rural households (e.g., whether more of them are able to send their children to school or to procure medical care) must also be conducted to strengthen the case for Sustainable Agriculture as a poverty alleviating strategy. Sustainable agriculture impacts not on the farm environment but on the whole community. It is, in fact, a community's life-support system.

3. Agricultural extension workers, as well as NGOs, need to be "retooled" to better promote the adoption and practice of Sustainable Agriculture.

4. There is a need to develop a curriculum for Sustainable Agriculture, and to keep updating such with other "knowledge products" as they are developed. A concerted effort must be made to integrate this curriculum into agricultural courses. Libraries should be provided with more materials on Sustainable Agriculture.

5. Approaches to scale up Sustainable Agriculture operations must be explored. The example of how China had been able to put millions of hectares under organic rice production has shown that scaling up Sustainable Agriculture is not a matter of technology, but of approach.

6. More resources must be mobilized in support of Sustainable Agriculture research. Development agencies and governments must be persuaded to augment their investments in Sustainable Agriculture.

References

AJPN (2005). *Narrative reports: Enhancing Capacities for Sustainable Agriculture Towards Poverty Reduction.* April 2004- March 2005; July 1- Sept.30, 2005; Oct. 1-Dec.31, 2005.

AJPN SA Grassroots Action Issue No. 19, August 22, 2005.

Arifin, B. 2004. Analisis ekonomi pertanian Indonesia *in Indonesia language*. Jakarta: PT Kompas Media Nusantara.

Asia–Japan Partnership Network for Sustainable Agriculture (2005). *Regional Resources Development Plan: Enhancing capacities for Sustainable Agriculture towards Poverty Reduction.*

Badan Pusat Statistik (Central Bureau Statistic). *(several years)*. Statistik Indonesia. Jakarta: BPS.

Departement Pertanian (The Ministry of Agriculture). *(several years)*. Statistik Pertanian Indonesia. Jakarta: Departemen Pertanian.

Diola, Faina, AJPN Regional Resource Development Plan 2005.

"Ends without means", *The Economist*, September 9, 2004.

FAO, IFAD, WFP (2005). *High-level Dialogue on Financing for Development: Meeting the Millennium Development Goals.* New York.

Food and Agricultural Organization (FAO). *(several years)*. Annual report. Rome: FAO.

Forum WTO-Indonesia. 2000. Annual Report. Jakarta: Departemen Luar Negeri.

Human Development Report 2005. International cooperation at a crossroads: Aid, trade and security in an unequal world. UNDP 2005.

IFAD, 2001. Rural Poverty Report 2001: The Challenge of Ending Rural Poverty. IFAD: Rome, Italy.

Khomsan, A. 2004. Perlu kebijakan mikro yang memihak petani *in Indonesia language*. Jakarta: Harian Kompas tanggal 16 Januari 2004.

PAN-AP (Pesticide Network-Asia Pacific). 2004. Perjalanan masyarakat 2004 untuk kedaulatan pangan mengutamakan hak kita atas tanah dan pangan *in Indonesia language*. Jakarta: PAN-AP Indonesia.

Sadewa, Y.S. 2003. Indonesia Perlu Mengoptimalkan AFTA *in Indonesia language*. Jakarta: Harian kompas 27 Agustus 2003.

Siregar, M. 2001. Analisis kebijaksanaan perdagangan komoditas pangan *in Indonesia language*. Bulletin Agro Ekonomi I (3) 2001: 12-17.

Statement from 59th Session High-Level Dialogue on Financing for Development: Financing for Food Security, Agriculture and Rural Development by FAO, IFAD and WFP; New York, June 2005.

"Sustainable Farm Practices Improve Third World Food Production," posted on January 24, 2006; URL: http://www.sciencedaily.com/releases/2006/01/060123163315.htm.

UN Millennium Declaration.