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Proceedings of the Regional Meeting

**Towards a Joint Regional Agenda
for the Alleviation of Poverty
through Agriculture and
Secondary Crop Development
Bangkok, 21-22 November 2007**

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Foreword

The 1990s saw a general decline in the prominence of agriculture in development circles, leading to consistent decreases in public allocations to agriculture throughout the region. Recently, however, there has been renewed pressure to re-invent the role of agriculture in the alleviation of poverty. It has also become quite clear that in Asia and the Pacific poverty is centred in rural areas, with 70 per cent of the region's poor being dependent on agriculture or related services. For these reasons, among others, attention to rural development appears to be gaining momentum throughout the region.

It was against this background that the Centre for Alleviation of Poverty through Secondary Crops' Development in Asia and the Pacific (CAPSA), conducted the regional meeting, "Towards a Joint Regional Agenda for the Alleviation of Poverty through Agriculture and Secondary Crop Development", in Bangkok, Thailand on 21–22 November 2007. This regional meeting brought together researchers, development practitioners and government officials from 14 member countries of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and four international institutions to share information between countries and to create a regional agenda for research and development priorities on poverty alleviation through agriculture. These proceedings stand as a record of that meeting. This volume contains many ideas, many of which are possibly not new. Many, however, are new in their own country-specific contexts, and do require follow up.

I would like to thank all the delegates that attended the meeting for their input to the discussions. Special thanks go to all the presenters, a list of whom appears in the following pages. The invaluable input of the members of CAPSA's Technical Committee must also be acknowledged. The workshop was made possible by generous funding from CAPSA's parent body, UNESCAP. Last but not least, a big thank you to the staff of CAPSA who planned, co-ordinated and implemented the workshop.

I trust that the presentations and discussions that are recorded within this volume will provide useful information and valuable guidance in our efforts to improve the

development of agriculture and secondary crops in the ongoing pursuit to eradicate poverty in the Asia and Pacific region.

September 2008

Taco Bottema
Head
UNESCAP-CAPSA

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CAPSA would like to express its sincere thanks to the institutions and representatives from countries that participated in the Regional Meeting. The enthusiasm and expertise of the country representatives who contributed to discussions and prepared papers for these proceedings is greatly appreciated. Particular thanks go to those people who made presentations at the meeting: Dr. Md. Ismail Hossain (Bangladesh), Dr. Fu Qin (China), Dr. P.K. Joshi (India), Dr. Tahlim Sudaryanto (Indonesia), Dr. Woon-Goo Ha (Republic of Korea), Mr. San Nyunt (Myanmar), Dr. Nanda Prasad Shrestha (Nepal), Dr. Syed Ghazanfar Abbas (Pakistan), Dr. Nicomedes P. Eleazar (Philippines), Dr. Raghunath Ghodake (PNG), Mr. J.A.T.P. Gunawardena (Sri Lanka), Ms. Ratchanee Wongchantrakarn (Thailand), and last but not least, Mr. Nguyen Van Nghiem (Viet Nam).

Thanks also go to the representatives of various international organizations who also made presentations at the Regional Meeting: Mr. Pijush K. Saha, Liaison Officer, Asia-Pacific Association of Agricultural Research Institutions (APAARI), Mr. Tomohide Sugino, Research Scientist, Japan International Research Center for Agricultural Sciences (JIRCAS), Dr. Jacques Marzin, CIRAD, and Dr. I Wayan Rusastra, Programme Leader Research and Development, CAPSA.

Various members of CAPSA's Technical Committee, participated in the Regional Meeting with their customary enthusiasm and commitment, and they are thanked for their ongoing contributions to CAPSA's work. Additionally, thanks are extended to Mr. Robert Baldwin for his editorial assistance.

Finally, deep gratitude is given to CAPSA staff members for their dedicated and efficient work in planning and co-ordinating the Regional Meeting, with particular thanks to Ms. Fransisca Anggraeni Wijaya and Mr. Harry Zulfikar for their tireless efforts in ensuring the meeting ran smoothly.

Executive Summary

This document is a record of the Regional Meeting, "Towards a Joint Regional Agenda for the Alleviation of Poverty through Agriculture and Secondary Crop Development", co-ordinated and implemented by the Centre for Alleviation of Poverty through Secondary Crops' Development in Asia and the Pacific (CAPSA), which was held in Bangkok, Thailand on 21–22 November 2007.

The purpose of the meeting was to create a regional agenda of research and development priorities on poverty alleviation through agriculture and to foster greater collaboration and information sharing across UNESCAP member countries on rural poverty alleviation through agriculture and secondary crops. The meeting was attended by researchers, development practitioners and government officials from UNESCAP's member countries and international organizations.

The Regional Meeting aimed to determine research priorities for improving the accuracy of policies and programmes addressing rural poverty through agriculture in member countries. Another goal of the meeting was to strengthen regional collaboration and information sharing. Factors underlying the motivation for this meeting include: the knowledge that poverty in the region mostly occurs in rural areas; an efficient way to accelerate poverty reduction is to exchange information and research on programmes and policies; and such regional collaboration in agriculture for poverty reduction is relatively undeveloped.

The final major topics for a joint regional agenda, identified by the meeting can be summarized as follows:

1. The problem of upscaling of successful agriculture development projects. It was felt that the broad rural development approach adopted by many countries would offer an excellent vehicle for upscaling. The role of local government was felt to be essential.
2. The participants agreed that there is a need for research of the synergetic effects of different types of interventions, one of which may include agriculture, but where others are focused on education, infrastructure, microfinance, and power, for example. Agriculture R&D is reported to have high internal rates of return between 50 and 100 per cent but it should be acknowledged that the contextual factors are usually of essential importance in its impact.

3. Substantial discussion was undertaken about project design in rural areas and the role of the private sector in reducing poverty. Reference was made to classic vertical integration whereby the whole supply chain is integrated in one transactional structure. This structure can step in with credits for small farmers and can also dampen price risk both of products and inputs. A related model, which is gaining some importance, is the financial sector and network base knowledge management for farmers. To some extent the RABO Bank Foundation is promoting such a structure to link up farmer co-operatives to finance. However the presence of co-operatives is not mandatory for such a project modality; private business is also possible.
4. On chronic poverty in rural areas it was agreed by all that inquiries into the long-term nature of poverty are virtually non-existent, and that there is an urgent need to address this matter in an empirical manner.
5. Having discussed the recent plethora of poverty alleviation programmes at the national and local level in Asia, it became clear that impact studies are very rare and that there is a great need for policy impact research using a combination of quantitative and qualitative data.
6. The meeting also indicated that it is important to define poverty in a dynamic way, for example 50 per cent less than the upper 50 per cent of the median. The one-dollar-a-day boundary, which is currently being used for the sake of simplicity, was not found fully acceptable. First because the wider issue of redistribution of income, and second because the rapidly declining USD vis-à-vis many Asian currencies.
7. It was also suggested that the increasingly large price fluctuations as well as the reported increasing prices of major commodities need to be investigated in the context of increasing globalization and cross-border trade.
8. The meeting further observed that conflict in isolated and often marginal areas does exist throughout the region, and that the law and order situation is the key to sustained up-scaleable interventions. It was also recalled that a large part of the population in isolated and marginal areas is made up by indigenous people, and that something should be done for them. Some interventions are being supported by International Fund for Agricultural Development (IFAD) and also United Nations Development Programme (UNDP), and some successful interventions were discussed, with a view to upscaling.

9. The meeting indicated that genetic modification, bioenergy and post-harvest/value-adding activities, market linkage and diversification continue to show good prospects for further investment and R&D. The meeting suggested establishing a regional network for research and information sharing among the countries in the region.

Funding for the project was received from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). The Regional Meeting took place on 21 and 22 November 2008, at the Royal Princess Hotel in Bangkok. It was attended by representatives of 14 countries and five international organizations. The programme comprised two sections. First a series of presentation from member countries, providing an overview of agriculture-related poverty reduction programmes and research activities. The second section included a general discussion on key themes and issues that emerged from the country presentations.

This volume provides a record of the presentations and discussions of the Regional Meeting.

Opening Session

Official Statements

The participating countries were invited to make a brief official statement at the opening session of the meeting. Japan, Indonesia and France made statements, a summary of which is as follows:

Mr. Jiro Usui

Counsellor and Deputy Permanent Representative to ESCAP, Embassy of Japan.

Mr. Usui thanked CAPSA for hosting this important and informative meeting, and expressed appreciation at being invited to attend. He wished the participants good luck for their meeting and hoped that would have substantial productive discussions over the two days, leading to concrete results at the meeting's conclusion. Mr. Usui noted that Japan recognizes the importance of agriculture and the important role played by CAPSA. He indicated that the Japanese Government has made contributions in the past for projects at CAPSA/CGPRT; in recent years, for example, the AGRIDIV and ELNINO projects, however funding has unfortunately declined in recent years. Nonetheless, Mr. Usui explained, CAPSA still has an important role in poverty alleviation. He expressed his pleasure that the meeting's opening statement indicated that CAPSA's objective is poverty alleviation; and despite the fact that the Japanese Government's contribution has decreased over recent years, he was pleased to say that JIRCAS – with one of its agricultural scientists stationed at CAPSA – will continue to make its contribution to CAPSA. Mr. Usui finished his statement with good wishes for a substantial and productive discussion.

Mr. Harya K. Sidharta

First Secretary and Alternate Permanent Representative to ESCAP, Embassy of the Republic of Indonesia.

Mr. Sidharta expressed his thanks to CAPSA for the invitation to attend the meeting, and appreciation to CAPSA for planning and implementing the Regional Meeting. He noted that poverty reduction is an important global agenda and a target of the Millennium Development Goals (MDGs), and that CAPSA plays an important role in achieving the MDGs through secondary crops and agricultural development. He also noted his hopes that the present restructuring of UNESCAP will enable a stronger link between CAPSA and UNESCAP's poverty reduction programmes. Mr. Sidharta wished participants success in their discussions.

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Ms. Mathilde Burnouf

Assistante du Conseiller régional de coopération et d'action culturelle, Ambassade de France.

Ms. Burnouf, expressed thanks for the invitation to attend the Regional Meeting and wished everyone a productive and fruitful meeting.

Opening Address

The role of agriculture in rural development: how can it alleviate poverty?

*Dr. Taco Bottema*¹

Your Excellencies, distinguished participants, colleagues and friends,

Allow me to welcome you all to this quiet meeting place in the bustling city of Bangkok in beautiful Thailand. I am sure I speak on behalf of all CAPSA staff, and also on behalf of our esteemed members of CAPSA's Technical Committee (TC), who have also kindly consented to be present on this occasion, when I express my sincerest appreciation for your presence. We thought it would be timely as well as necessary to have this meeting, and we organized it in Bangkok so as to have some closer connection with our colleagues of the ESCAP Secretariat. I thank you all and especially our friends from the TC, for your attendance at this meeting.

As is our tradition at CAPSA, I propose we talk about what is on our minds. I trust you will not mind if I attempt a bit of stage setting. In agriculture, all of us are all too aware that no matter what words we use, that the basic biological and economic principles, which underlie plant growth and human behaviour, remain the same. We may cook up different words, but that does not change the reality around us.

I should go on to say immediately that most of you will recall in 2004 that the mandate of CAPSA changed towards poverty alleviation through secondary crops. Now this is not just a semantic change. This is the second regional meeting that we have organized: the first one being the meeting following on from the diversification project in 2006, so kindly funded by the Japanese Government. In this meeting we will really try and see if a mandate such as CAPSA has can be taken up in a regional context.

Those familiar with agriculture and rural development know that there has been a very well developed set of international and regional networks connecting national and international centres of excellence. However since the formulation of the Millennium Development Goals and the fading of the profile of agriculture during the 1990s, public support and participation in these established networks have eroded. At the same time

¹ Head, UNESCAP-CAPSA, Bogor, Indonesia.

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there is now continuous pressure to re-invent the role of agriculture in the alleviation of poverty.

But, now, towards the end of 2007 we all witness a unique event. The World Development Report is devoted to agriculture and its role in development in general. There is no doubt that the choice to focus on agriculture has been inspired by the concerted willingness of the donor community to focus efforts in Africa because it lags behind in many ways. By the same token, however, we should also consider the role of agriculture in Asia. All of us will remember that Asia generated an historically unique period where national economic growth was in fact partly driven by agriculture, at the time of the green revolution in the 1970s and 1980s. Now in 2007, important recent conferences in Manila and in Beijing further underscore the importance of the increasingly complex policy issues facing the governments of the member countries. We have made the main conclusions available for your information.

If we look at agriculture, its productivity and wages, we now see in Asia stagnating productivity, stagnating agricultural wages, a rapidly increasing income gap between urban and rural areas and at the same time a rapidly aging population in rural areas, where 75 per cent of Asia's poor are concentrated. We see a great fragmentation of more and more smallholders occupying smaller and smaller parcels of land. We also see resource depletion in many fragile, largely rainfed areas. In the meantime prices of foodstuffs have gone up globally, most likely due to pressure from increases in energy prices, but, who knows maybe also because of structural reasons. There is intense interest in the bioenergy industry, which is going through a boom. We see imports and intra- and inter-regional trade in competition with smallholder supply for the rapidly growing urban markets; and a variable pattern of localized developments, based on agriculture. We also see a growing importance of food quality and certification systems.

One very fundamental conclusion following the underlying line of analysis of the World Development Report is that agriculture needs long-term and steady support, while in the course of development the role of the private sector increases steadily as a development partner. This is neither new nor spectacular; but all too true. We should keep this in mind, and remind our policymakers of it. And the donor community, I would add.

At this point I would like to digress and anticipate some discussion that I hope will occur later in this room. Since the Asian crisis many new types of policies have entered the stage. The most prominent I would think is the so-called cash transfer. The logic behind this is astoundingly simple. Are you poor? Let us give you some money. Many an economist,

used to making do with the givens of productive investment and scarce allocation, has raised the eyebrows to unprecedented levels. Larding out cash was the very thing that most of us learned not to promote. Nevertheless it is happening, such is the new reality and such are apparently the needs in Asia after the crisis. Throughout the region there is discussion about populist policy, and this is only natural and healthy. In the meantime, where is our good old food policy? In most countries this policy is now spread out over a number of ministries, and is wavering between producer and consumer biases. But in terms of research hardly anything seems to happen – with a few exceptions of course. The rural development scene has changed. It is up to us to find and steer a rational course and try and help the development process.

There are more changes. The role of local government especially is coming out as of crucial importance in particular when it comes to local investment in infrastructure, irrigation, electricity and communication. The pillars of rural development are very much investment in an enabling rural environment. It would seem that the rural-urban income gap has pushed governments to give attention to rural development, which appears to be gaining momentum in a number of countries, China and India, for example. But definitely also in Indonesia and other countries like Bangladesh, Viet Nam and Thailand. Everywhere in fact; however the big investment numbers come from the big countries. With a number of major projects on rural development going on in the region, focusing on sub-district and community level, some very interesting mainstreaming of public investment in rural areas is in the making. We should acknowledge that the task of alleviating poverty in rural areas belongs to many ministries, local government as well as the private sector and NGOs; agriculture ministries and their various departments, are just one of many. Does this create opportunities for linking agriculture in? There must be great learning to be had from these big projects. Not only from the ongoing projects but also from past experience in the Republic of Korea, Japan and Malaysia.

One thing that may have gone largely unnoticed is the really tremendous progress by agriculture-based co-operatives. The issue of co-operatives has always played a big role in development thought in Asia. But right now, globally, 300 co-operatives – one third of them agriculture-based, and many based in Asia – turn over one trillion dollars per year. One important question is how to link SMEs to these co-operatives.

It would then seem to be of vital importance to continue and intensify localized R&D and to maintain a pattern of development based on diversity, in terms of genetics, in terms of plant breeding, in terms of sources of income, and of course in terms of technology.

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Maybe in Asia today one of the ideals that came up during the green revolution – namely local rice-based crops and technology improvements – can be realized in the coming period. There are more ideas and practices stemming from earlier years that now deserve re-consideration, such as extension services, which, in combination with community grants and local investment can make the rural governance and economic machinery work.

However, a large proportion of the rural population in Asia (well over 120 million people) lives in very isolated and marginal conditions and it is quite a big challenge to engage this people in inclusive growth. Agriculture improvement should be able to play a major role in improving livelihoods in isolated and marginal areas such as eroded hill land, coastal marsh land, mountain areas and dry rainfed zones. A large proportion of these people are indigenous people, living in borderland areas, in uneasy development conditions. One could also include small islands in the dry zones in the archipelagos in the Philippines, Indonesia and Micronesia. Should we do something about them? Can we?

We also have to acknowledge that the major public attention for global climate change should be a source of innovation and improvement in resource management. Many of the issues in this area are still under debate and investigation.

Most researchers and development agriculturalists assume that any work resulting in improved technology, improved productivity and improved farm income would automatically result in the alleviation of poverty. However, if we take the alleviation of poverty to be the main goal of our development activities in agriculture, it would mean that we would target those people making a living from agriculture at a level below the poverty line. If we really go for the poorest of the poor we would focus on a group of people with a low absorption capacity, limited scope for innovation, and limited access to credit and markets. Such a focus would limit the chances for success of the strategy, unless there was public allocation on a massive scale to improve agriculture. But drawing this line may be too literal, given that the reality of local growth is more complex.

We can distinguish four ways of alleviating poverty in rural areas:

1. transferring cash to the poor
2. increasing farm and labour productivity and income in agriculture
3. including the local rural and agriculture economies in a wider process of economic growth
4. reducing costs and increasing prices through subsidies.

These four ways of alleviating poverty do not exclude one another. We have asked you to group projects, programmes and other activities in these four categories of impact channels. Some type of activities may impact along multiple channels. The idea is to look at agriculture through the looking glass of alleviating poverty, and to help move towards policy in this area.

Our meeting seeks to identify what type of agriculture-based project has a direct or indirect impact on local employment and income. Let us see if there is scope and a need for a regional agenda, one that we can share and implement, based on real, and not necessarily big, allocations.

Thank you all, and I wish you fruitful deliberations!

Discussion Session

Report on Discussion Sessions and Key Points for a Joint Regional Agenda

The Regional Meeting had two main parts. In the first part, each country made a presentation about the status of agricultural and secondary crops research relating to poverty alleviation in their respective countries. The presentations were made in four groups (groups A, B, C and D) over the first day and a half of the meeting (see Appendix 3 for the meeting's programme). At the end of each group of presentations there was a general discussion on issues raised in the presentations. Together, the main issues from each discussion formed the basis of the second part of the meeting, a discussion to formulate the key points for the joint regional agenda.

The following record of the meeting is structured around the group discussions and the final discussion session. Papers for each individual country presentation can be found in the next section of this document. The report on each group of presentations has two sections. The first is a raconteur's summary of the main points from the presentations. These points were selected for their potential to develop the key points for the joint regional agenda. The second is a similar summary of main points from the discussion that followed each group of presentations, as noted by the session chair and recorded by a raconteur.

The record of the final discussion session is also presented in two sections. The first is a general summary of points compiled from observations of the session chair and a rapporteur's notes. The second section is a distillation of the issues from the previous discussion into the key points for the joint regional agenda.

Country presentations – Group A

This group of presentations was made on the morning session of the first day of the meeting and comprised presentations by Bangladesh, China and India.

Summary of main points from presentations

1. The success story of poverty alleviation achievements in China is actually based on an appropriate approach called: 'Multi-sectoral community empowerment development approach' – which is shown to be correct by practice.
2. There are broad categories of programmes for poverty alleviation in the region, with varied achievements on poverty alleviation. For efficiency and effectiveness of the

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respective programmes, there is a need for immediate assessment of the programme in terms of programme formulation, its implementation, and its sustainability for poverty alleviation.

3. Most of the remaining poor people in the region reside in remote and marginal areas with limited infrastructure and access to income-generating sources and employment. In this context the role of infrastructure development (to connect rural and urban areas; and to improve human capabilities of the poor people) on health and education is necessary.
4. Researchable issues proposed by the participants include:
 - The characteristics and the role of resource endowment
 - The role of agricultural R&D
 - The role of innovative institutional arrangements on agricultural development
 - The role of agricultural diversification and agro-processing
 - The role of agriculture and rural policies for sustained poverty alleviation
5. The success of poverty alleviation programmes will depend on two factors: (1) farmers' awareness and capacity for self-development; and (2) the government-oriented poverty reduction plan. The first one should be based on a participatory approach to stimulate active participation of the farmers and acknowledge their capacity for self-management and self-development. A development-oriented priority poverty reduction plan will depend on the leading role of the government, social participation, self-reliance, development orientation, and comprehensive, co-ordinated development.

Summary of main points from question and discussion session

1. When agricultural GDP decreases and the agricultural population increases, what is the way out? It is necessary to investigate how countries can compete with the world market, under new WTO regime.
2. With respect to contract marketing and private sector contracts: if this is to be considered a good model for poverty alleviation, we need to consider risk sharing in linking private and public entities, in order to ensure that farmers are not exploited – what is the role of the government in this regard? Strengthening the supply chain between farmer and supermarkets is one aspect that warrants further investigation.
3. There is an issue of equity to consider in fast growing economies: how to share benefits of economic growth with the rural sector. There is a need to balance rural and urban development and investment.

4. With the continuing decline in the contribution of agriculture as a proportion of the economy, what will be the role of the agriculture sector? What will be done with excess labour? India's problem will be absorbing people in other sectors. There is a need to close the gap between the agriculture and the non-agriculture sectors.
5. There is a need to focus on people in remote areas where there are areas of extreme poverty.

Country presentations – Group B

This group of presentations was made on the afternoon session of the first day of the meeting and comprised presentations by Indonesia, Republic of Korea and Myanmar.

Summary of main points from presentations

1. There are various poverty alleviation projects in agricultural and rural development. Some of those are considered to be a success story, and ready for replication in the country of origin and even for other countries. Selection of successful poverty alleviation projects should be conducted in order to have models for best practice for poverty alleviation in the Asia Pacific region.
2. The lesson learned from implementing various poverty alleviation programmes in the region are:
 - (a) they should be targeted to the poorest segment of the poor;
 - (b) community participation is necessary in various stages of the projects;
 - (c) financial support for the poor is needed, but only as a partial grant;
 - (d) appropriate technical backstopping is required;
 - (e) start with a model at a limited site, then scale up.
3. To support poverty alleviation programmes, the major research areas that should be considered are:
 - (a) poverty measurement
 - (b) analysis of characteristic and causes of poverty
 - (c) analysis of policy and programmes.
4. In dealing with poverty measurement, the emphasis should be on: improving production, income and welfare; increasing quality and competency; and building capacity of self-development and sustainability.
5. There are at least seven broad categories of programmes for poverty alleviation: (a) augmenting farm income and labour productivity; (b) direct employment-generating programmes; (c) rural development programmes; (d) local area development

programmes; (e) transfer of cash and food grants to poor; (f) reducing costs through subsidies and augmenting price; and (g) market reforms to integrate farmers with growing markets. All of those partial sectoral programmes should be carefully designed and based on a community empowerment development approach in order to have sustainable inclusive growth for sustained poverty alleviation.

6. Poverty has declined, but we are yet to accomplish the MDGs. A multi-dimensional approach should be adopted to alleviate poverty. Investment in agriculture and research is a necessary condition. Besides a direct measure for poverty alleviation, involving innovative institutions complemented by age-old policies in order to integrate domestic and global markets is a sufficient condition for poverty alleviation.
7. Policy and programmes for poverty alleviation at domestic level should be adjusted according to the dynamic context of the changing international economic environment. The following external factors should be taken into account: biofuel development; climate change and global warming; decentralization; organic food and sustainable farming and agricultural development; and trade and globalization. All of these will generate a substantial impact for the strategic policy for food security and poverty alleviation.

Summary of main points from question and discussion session

1. The driving forces for poverty alleviation through agriculture: technology, market, and natural resource management; supported by appropriate institutions and capacity building programmes.
2. Potential or prospective access points for interventions include: post-harvest value adding; GMO and biotechnology production; connecting to markets and e-business; risk management and poverty alleviation; and impact assessment – ongoing programmes, both direct and indirect.
3. An area of research requiring further investigation is the causes of poverty.
4. Poverty reduction is influenced by many factors, not just agriculture and we need to look at it in a broader sense – some macro-level modelling is required for some solutions.
5. There are differences in definition of poverty between countries. For example, the measure taken for Korea's poor may be at a higher level than many other countries. Within countries and between countries there are disparities in what constitutes 'poor'. The poverty line according to the World Bank is USD 2 per day.

6. There are issues related to marketing goods over borders which would bear further research.
7. There is much to be gained from capitalizing on information on the roles of agriculture for poverty alleviation. For example, on current changes, such as: the impact of biofuels on the income of poor rural households and food security; price instability and national food security; and on public policies for poverty alleviation.
8. Much is to be gained by developing common projects in countries across the region.
9. A potentially valuable approach is to promote the emergence of inter-connected networks in the region (universities, agricultural research, policymakers, producers' organizations, etc.).

Country presentations – Group C

This group of presentations was made on the morning session of the second day of the meeting and comprised presentations by Nepal, the Philippines and Pakistan.

Summary of main points from presentations

1. Agricultural and rural development for poverty alleviation faces new challenges. These should be responded to with regional innovative and demand-driven research and science-based technologies. New research strategies should consist of: the application of biotechnology (NHVY) integrated farming systems approach for smallholders; participative research and development; linking farmers with markets; biosafety and WTO compliance; development of resources and energy conservation technologies; and enhanced national and international partnerships with stakeholders and agriculture ministries.
2. In the case of Nepal, the government implemented four pillars of poverty reduction strategies: (a) broad-based economic growth; (b) social sector development including human development; (c) targeted programmes including social inclusiveness; and (d) good governance. All pillars are essential for improving the lives of the poor, the very poor and deprived groups, and for promoting inclusive growth.
3. Poverty is a main challenge for developing countries and it is deeply rooted in rural areas. The way forward should consider: development infrastructure; enhancement of market-led agricultural production; rural financial institutions; agricultural diversification; rural-urban linkages for improving the rural economy; appropriate and

effective agricultural subsidies; strengthening the agricultural insurance system; and enhancing institutional capacity at both local and national levels.

4. In the case of the Philippines, the government introduced “Five Development Pillars for Agriculture and Fisheries” for poverty alleviation, i.e. irrigation; post-harvest and storage; market access; R&D, education and extension; and credit facilitation. The government has been implementing not less than 10 related agricultural and rural programmes for poverty alleviation. All of these programmes are dedicated to achieving the following goals: (i) to develop 2 million ha of idle or vacant land for agribusiness development to guarantee 2 million jobs by 2010; (ii) the reduction of costs of wage-goods through productivity enhancement, efficient logistics, and improved retailing linkages.

Summary of main points from question and discussion session

1. There are many challenges with regard to the biofuel debate, the use of land and food for biofuel versus food security. We need to find strategies for the use of a number of different crops to meet the same objectives of poverty reduction. There is a need for research on the viability of biofuels; whether land used for this (for example, land that was previously barren or not) would be better used for other crops. Does biofuel help decrease poverty or not?
2. There have been many years of talk and effort in agricultural development and poverty reduction but we are still not targeting ourselves adequately.
3. Sustainability of our programmes has not been achieved. Sustainability is rarely, if ever, achieved by the end of the project or by the time donor’s funds are used. Consideration should be given to what CAPSA can do to help achieve sustainable programmes in the long term.
4. Poverty is higher in rural areas due to poor access, i.e. it occurs in rocky and remote areas.
5. The national policy scene (in Nepal for example, and other countries) for poverty reduction is complicated by the input or involvement of several different ministries, each with a role that influences the implementation of various poverty reduction programmes and projects. Therefore, we need to consider the evolution and promotion of inter-connected networks.
6. The role of linking small farmers to marketing chain should be investigated.
7. Co-operation and collaboration in projects and avoiding duplication of projects, was highlighted as important principle for poverty reduction across the region.

Country presentations – Group D

This group of presentations was made on the midday session of the second day of the meeting and comprised presentations by Papua New Guinea, Sri Lanka, Thailand and Viet Nam.

Summary of main points from presentations

1. To realize the poverty reduction objective of any nation, PNG proposed a multi-pronged strategy involving good macro-economic growth; efficient and effective technologies and innovations; appropriate policies; and broad-based economic growth with wider participation of the people. The government implemented not less than 10 programmes and projects for poverty eradication which were dedicated to increasing productivity and income, in addition to a wider process of economic growth. Food security through selective subsidies is still needed at least over the short to medium term. Transfer of cash through any mechanisms needs to be avoided unless for humanitarian reasons.
2. The experience of Sri Lanka, during the last few decades, suggests that the benefit of growth has not trickled down to many segments of the poor. Despite reasonable national economic growth of 5 per cent per year, poverty remains in the country. The government policies and programme should be redesigned to give attention to agriculture, which accounts for the livelihoods of the majority (70 per cent) of the poor. Development of a subsidiary food crop sector is an important approach in reducing poverty in rainfed and marginal areas where incidence of poverty is high. The respective approaches have to be complemented with favourable policies, developing appropriate technologies and its dissemination.
3. The government of Sri Lanka has three programmes for poverty reduction, which are dedicated to poor people, especially for those residing in remote areas: (a) a programme of socio-economic development in extremely difficult communities for ethnic minorities and mountain regions; (b) national poverty targeted programmes; and (c) other related projects/programmes, for instance, a national extension programme, compulsory primary education, and programmes for rural clean water supply and rural electricity supply. Basically, the objective of the first programme is to: radically accelerate production; promote the agro-economic structural shift; improve agricultural and national living conditions; and narrow the development gap between ethnic groups and other regions. The objective of the second programme is

to halve the poverty incidence from 22 per cent to 11 per cent during the period 2005-2010. Around 50 per cent of the island's and coastal community will benefit from the national poverty-targeted programme.

4. The government of Thailand proposed agricultural and national development based on the "Philosophy of Sufficiency Economy". This new paradigm of development is supported and complemented by interrelated national development strategies and agricultural development strategies. The main target of this approach is to reduce the number of poor farm households to 4 per cent by 2011. The main strategies for agricultural development are: (a) capacity building and strengthening of farmers' organizations; (b) diversification and value creation of agricultural products; i.e. effective management of agricultural resources; and (c) increasing efficiency and good governance.

Summary of main points from question and discussion session

1. While macro economic growth is necessary for poverty reduction, it alone is not enough and due attention needs to be given to other aspects of poverty reduction.
2. It must be acknowledged that poverty reduction programmes are dealing with formidable dimensions of poverty (income, welfare, capacity).
3. Public investment is important for marginal areas. We need to consider the value of subsidizing – where/when is it worth it or not worth it? Similarly, consideration should be given to whether there is any benefit in cash handouts.
4. Community organizations, e.g. farmer's organizations, are important actors in reducing poverty.
5. It was noted that the agriculture sector is not isolated from other sectors in the pursuit of poverty reduction. All poverty reduction endeavours should be integrated across all sectors (e.g. education, law and order, health, etc.).
6. The question was discussed about how to bring the benefits of macro-economic development to all people. Often the benefits of subsidies do not go to farmers. Sometimes the decision to give subsidies is not economic but political.
7. Other questions raised as worthy of further investigation include: do secondary crops offer a way out of poverty or not? And, what are the root causes of poverty?

General group discussion and key points for Joint Regional Agenda

This section is a record of the final discussion session. It presents a general summary of points compiled from observations of the session chair and a rapporteur's notes. Following this is a distillation of the issues from the previous discussion into the key points for the joint regional agenda.

To provide a starting point and structure for the general group discussions, a document summarizing key points, observations, problems and questions raised during the country presentations and group discussions, was distributed to participants. This document, 'Key points for discussion' can be found in Appendix 4.

Themed summary of discussion points

Globalization

Demand patterns are changing as a consequence of globalization and we need to look at how to harness the benefits of these changes. For example, for many small farmers, labour-intensive crops – vegetables, poultry, fish – which offer a quick, high return are of most value. An important task therefore is to connect farmers to markets. We need to identify niche markets, and investigate new one-to-one (micro) marketing opportunities.

The characteristics of poverty

We need to learn more about the characteristics of people in poverty in particular contexts and circumstances. We must address questions such as: Why are the poor poor? What is their difficulty? How do we remove this difficulty? Are the poverty affected empowered to use their own resources? What are the resources they have at the farm-level; and are they sustainable?

Community participation

The importance of community participation was discussed. For example how best to motivate the community. For successful interventions, once target groups are identified, there should be social preparation, training and social mobilization in order to give projects and programmes the best chance for success and sustainability. The commitment of local government units is also important.

Cash subsidies and credit systems

There was debate about the value of cash subsidies. The risk with cash subsidies is its fungibility – that the recipients will use it for something other than it was intended. This is

an unsustainable approach. A credit system is preferable, because the cash handout is not a sustainable option. However it was suggested that a one-off 'start-up' payment can be effective as long as the recipient is taught how to be sustainable.

Policy targeting

It was acknowledged that there are two broad directions for policy: a generic level aimed at higher economic growth which affects all levels of society; and targeted policies aimed at specific poor segments of society. We need to bring together lessons that will help us to make targeted policies even better. We need to fill gaps in our knowledge and understanding. One possible approach for targeted policies is a project that decides which disadvantaged groups should be focused on, and what are the characteristics of this poverty group. It should be noted that CAPSA's role in conducting and promoting research that supports the people and organizations that are the implementers of these policies.

It was noted that the poor can be targeted in two ways: geographically and individually. The former targets all people in a defined territory. The latter is on a personal basis. What must be considered is: in which conditions is which approach to targeting more efficient?

We need to differentiate between the chronically poor and the transient poor. For the chronically poor, conditional direct cash transfers are appropriate. For transient poor of the above territorial classification, a participatory community empowerment approach is appropriate.

Remote and marginal areas

One area of interest is how to make better use of available resources especially in remote areas? We need to identify the comparative advantages for each location and area, and work from there. Capacity building of individuals and groups is an important objective.

Additionally, there are intergenerational issues. How do we encourage younger people to take up agriculture? We need to make agriculture attractive to the next generation. There needs to be off-farm employment to engage youth.

Upscaling

Upscaling is an issue we need to consider. Agriculture is a risky business in both production and marketing. Marginal farmers are poor and don't invest.

What are the lessons learned from successful financial sectors, and how can we apply them to upscaling in agriculture?

There is a challenge in working with governments in-country in that programmes and projects are bounded by a single ministry. In reality projects, such as agriculture-based projects are crosscutting and are relevant to and require input from several ministries and sectors. Of the three layers of government budgets – central, provincial, local/village – the local level is where agriculture should be on the agenda. Forty per cent of farm income is from the non-farm sector.

Project modalities

The variety of project modalities and the role of the private sector are growing. In addition to the vertically integrated operation, the region now also has service-based project modalities while farmer co-operatives are gaining in strength and popularity.

Communication network

Development of communication among research institutes and government departments in and between countries is an important issue. Success stories should be made available, so that countries can learn from one another and avoid duplication. There was strong support for the proposal about establishing/maintaining a communication network. It was suggested that CAPSA should be a communication channel. A high value was placed on meetings such as this Regional Meeting and similar seminars, and investigation should be undertaken into ways of continuing such meetings.

Summary of key points for Joint Regional Agenda

The final major topics for a Joint Regional Agenda, identified by the meeting can be summarized as follows:

1. The problem of upscaling of successful agriculture development projects. It was felt that the broad rural development approach adopted by many countries would offer an excellent vehicle for upscaling. The role of local government was felt to be essential.
2. The participants agreed that there is a need for research of the synergetic effects of different types of interventions, one of which may include agriculture, but where others are focused on education, infrastructure, microfinance, and power, for example. Agriculture R&D is reported to have high internal rates of return between 50 and 100 per cent but it should be acknowledged that the contextual factors are usually of essential importance in its impact.
3. Substantial discussion was undertaken about project design in rural areas and the role of the private sector in reducing poverty. Reference was made to classic vertical

integration whereby the whole supply chain is integrated in one transactional structure. This structure can step in with credits for small farmers and can also dampen price risk both of products and inputs. A related model, which is gaining some importance, is the financial sector and network base knowledge management for farmers. To some extent the RABO Bank Foundation is promoting such a structure to link up farmer co-operatives to finance. However the presence of co-operatives is not mandatory for such a project modality; private business is also possible.

4. On chronic poverty in rural areas it was agreed by all that inquiries into the long-term nature of poverty are virtually non-existent, and that there is an urgent need to address this matter in an empirical manner.
5. Having discussed the recent plethora of poverty alleviation programmes at the national and local level in Asia, it became clear that impact studies are very rare and that there is a great need for policy impact research using a combination of quantitative and qualitative data.
6. The meeting also indicated that it is important to define poverty in a dynamic way, for example 50 per cent less than the upper 50 per cent of the median. The one-dollar-a-day boundary, which is currently being used for the sake of simplicity, was not found fully acceptable. First because the wider issue of redistribution of income, and second because the rapidly declining USD *vis-à-vis* many Asian currencies.
7. It was also suggested that the increasingly large price fluctuations as well as the reported increasing prices of major commodities need to be investigated in the context of increasing globalization and cross-border trade.
8. The meeting further observed that conflict in isolated and often marginal areas does exist throughout the region, and that the law and order situation is the key to sustained upscaleable interventions. It was also recalled that a large part of the population in isolated and marginal areas is made up by indigenous people, and that something should be done for them. Some interventions are being supported by IFAD and also UNDP, and some successful interventions were discussed, with a view to upscaling.
9. The meeting indicated that genetic modification, bioenergy and post-harvest/value-adding activities, market linkage and diversification continue to show good prospects for further investment and R&D. The meeting suggested establishing a regional network for research and information sharing among the countries in the region.

Country Paper Presentations

Country Paper Presentations

Presentations were made by the following representatives from CAPSA's focal institutes in member countries:

Dr. Fu Qin	Director General, Professor, Institute of Agricultural Economics and Management, Chinese Academy of Agricultural Sciences
Dr. P. K. Joshi	Director, National Centre for Agricultural Economics and Policy Research, India
Dr. Tahlim Sudaryanto	Director, Indonesian Center for Agriculture Socio Economic and Policy Studies
Dr. Woon-Goo Ha	International Technical Cooperation Center, Rural Development Administration, Republic of Korea
Mr. San Nyunt	General Manager, Myanmar Agriculture Service
Dr. Nanda Prasad Shrestha	Executive Director, Nepal Agricultural Research Council
Dr. Syed Ghazanfar Abbas	Pakistan Agricultural Research Council
Dr. Nicomedes P. Eleazar	Director, Bureau of Agricultural Research, Philippines
Dr. Raghunath Ghodake	Director General, PNG National Agricultural Research Institute
Mr. J.A.T.P. Gunawardena	Socio Economics and Planning Centre, Department of Agriculture, Sri Lanka
Mr. Nguyen Van Nghiem	Department of Co-operatives and Rural Development, Ministry of Agriculture and Rural Development, Viet Nam

Presentations were also made by the international organizations represented at the Regional Meeting. The following written paper was submitted for inclusion in these Proceedings:

Mr. Tomohide Sugino	Senior Researcher, Japan International Research Center for Agricultural Sciences
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The Alleviation of Poverty through Agriculture and Secondary Crop Development in China*

*Dr. Fu Qin** and Mrs. Xiangfei Xin****

Achievement and experiences

The People's Republic of China is a developing country with a large population. Due to the social, economic, geographical and many other historical reasons, most people in poverty are concentrated in rural regions, ethnic minority areas, border areas and regions with extremely poor resource conditions. The poverty problem in urban areas emerged as well in the 1990s along with economic structural adjustments in China. Studies using data from the State Statistic Bureau show that poverty in rural areas accounts for 99.2 per cent of the total poor in China. When a poverty standard of 'one dollar a day' based on the conversion of Purchasing Power Parity (PPP) is applied, the rural population makes up 99.4 per cent of the total poor of the country. Poverty in China is critically rural poverty.

There were about 250 million poor people in rural areas in 1978. Since the beginning of open policies and rural reform, the Chinese Government has made great efforts to promote economic development and to improve people's living standards. The government has specifically launched a series of organized, and planned large-scale development-oriented poverty reduction campaigns throughout the country since 1986. After years of relentless hard work, China has made remarkable progress and drawn worldwide acclaim in poverty reduction.

Over 200 million rural poor people have been provided with appropriate food and clothing. Both the absolute number of people in poverty and poverty incidence in rural areas have declined enormously (Figure 1), from 250 million in 1978 to 21.48 million people in 2006, demonstrating a decline in poverty incidence from 30.7 per cent to 2.3 per cent. According to World Bank data, the poor population in China decreased by 195 million from

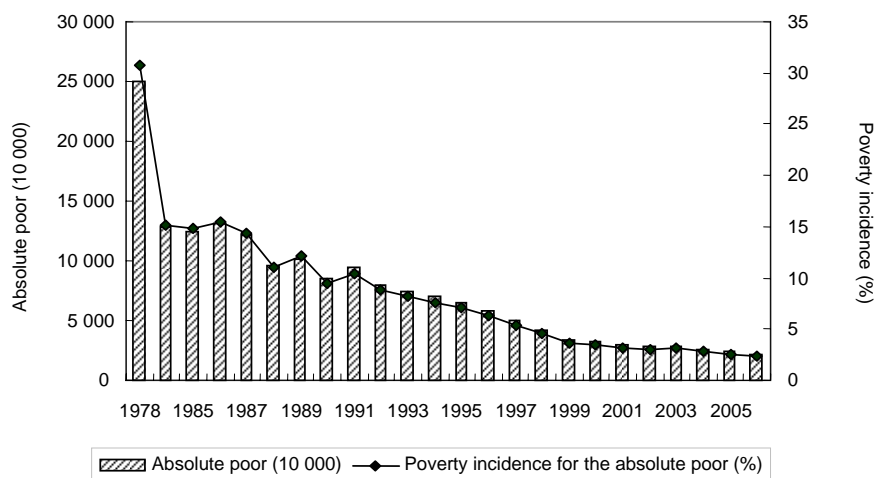
* Paper presented at the Regional Meeting, Towards a Joint Regional Agenda for the Alleviation of Poverty through Agriculture and Secondary Crop Development, UNESCAP-CAPSA, Bangkok, 21-22 November, 2007.

** Director General, Professor, Institute of Agricultural Economics and Development, Chinese Academy of Agricultural Sciences.

*** College of Economics and Management, China Agricultural University.

1999 to 2002, which constitutes over 90 per cent of the worldwide population that has been lifted up from below the poverty line.

Figure 1. The absolute poor in rural China and poverty incidence



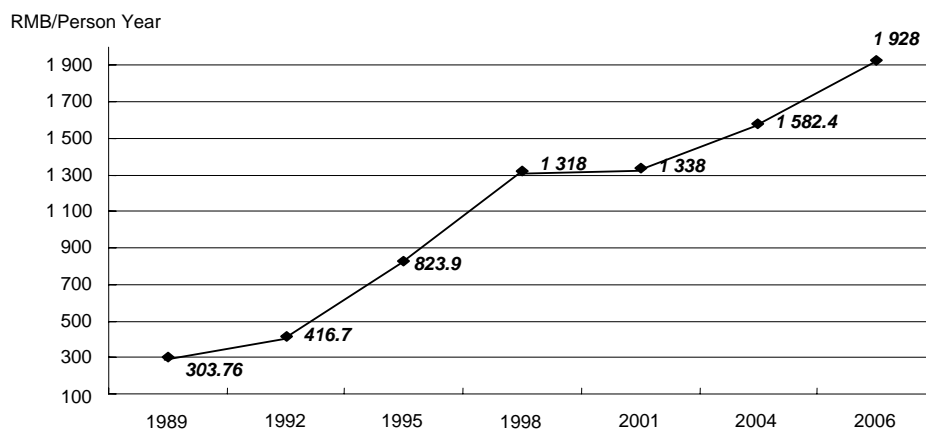
Living and working conditions have been improved remarkably. New farmlands amounting to 128.8 million *mu* (15 *mu* = 1 hectare) have been exploited in poor regions. Over 116.47 million people have been provided with potable water and 117.6 million farm animals have been distributed to the poor between 1986 and 2006. By the end of 2006, 81.9 per cent of rural areas could get access to roads, 95.83 per cent had publicly supplied electricity and 75.83 per cent had telephone services (Table 1).

Social undertakings have made remarkable progress too. By the end of 2006, the education conditions in the poor areas had been significantly improved. Over 590 key counties listed in state poverty alleviation projects have basically reached the target of nine-years compulsory education, eliminating illiteracy among young and middle-aged people. Over half the counties (53.01 per cent) have set up pre-school classes or kindergartens. Medical clinics have been renovated or rebuilt and the problem of lack of medicine and doctors has basically been solved: 73.49 per cent of villages has set up clinics; 74.65 per cent has qualified village doctors; and 70.77 per cent has qualified midwives. Public recreational conditions in rural area have been improved, with 89.07 per cent of villages having access to radio and TV programmes, greatly enriching rural residents' cultural lives (Table 1).

Table 1. Infrastructure and social undertakings development in key poor counties (2002-2006)

Indicator (%)	2002	2003	2004	2005	2006
Villages with access to road	72.1	75.1	77.6	78.99	81.19
Villages with access to electricity	92.79	93.9	95.1	95.78	95.83
Villages with access to telephone	52.39	59.1	64.4	73.78	79.95
Villages with access to TV signal	83.68	86.5	87.8	87.62	89.07
Villages with clinics	9.86	70.2	72.5	73.15	73.49
Villages with qualified village doctors/ health attendant	10.18	72.3	74.3	74.65	74.65
Villages with qualified midwives	9.58	69.6	71.5	71.19	70.77

The economic conditions in poor areas have developed noticeably in recent years. From 2000 to 2006, the added value of agricultural production in the key counties listed in the state's poverty alleviation projects increased by 66.6 per cent, industrial added value increased by 207.3 per cent, local financial revenue within the budget increased by 1.03 times, grain production increased by 18.4 per cent with annual growth rates of 8.9 per cent, 20.6 per cent, 12.5 per cent and 2.9 per cent respectively. The net per capita income of farmers increased from RMB ¥ 303.76 in 1989 to RMB ¥ 1,982 in 2006, at an annual increase of 12.2 per cent (Figure 2).

Figure 2. Per capita net income in the State's key counties (1986-2006)

Farmers' awareness and capacity for self-development also improved remarkably. A participatory approach has been adopted in poverty reduction and development projects to

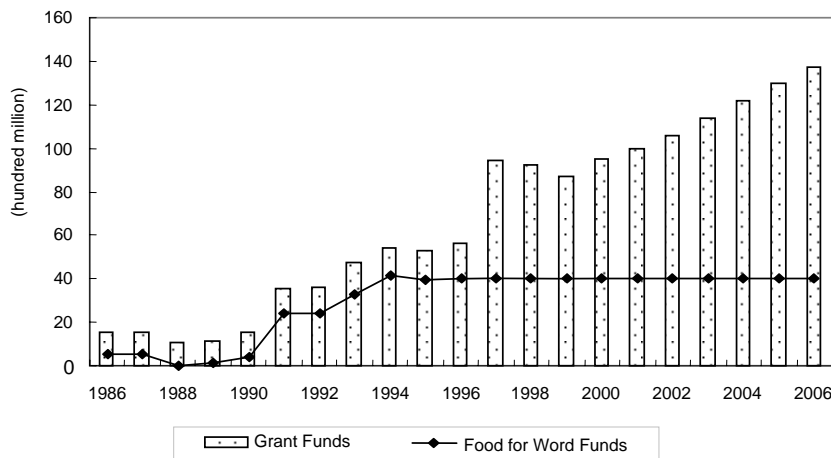
stimulate the enthusiasm, creativity and active participation of farmers with the important role that is played by women in household production. As a result, farmers' capacity for self-governance and self-development is improved continuously.

After years of efforts, China has blazed a trail for poverty alleviation. The main approach can be summarized as the leading role of the government, social participation, self-reliance, development orientation and integrated and co-ordinated development.

Leading role of the government

The Chinese Government highlighted poverty alleviation and development work into the national economic and social plan by establishing specialized organizations and funds as well as formulating a series of important policy documents to guide poverty alleviation, such as the National Seven-year Priority Poverty Alleviation Programme and The Development-oriented Poverty Reduction Programme for Rural China (2001-2010). The government also designated 592 poor counties and 148,000 poor villages as national key counties and villages that received special attention and support in a planned manner. Over the past 20 years, the budget from the Central Government has reached RMB ¥ 150 billion for poverty reduction, and the annual input has been increased from RMB ¥ 1.9 billion in 1986 to ¥ 14.4 billion in 2007 (Figure 3).

Figure 3. Investment increase in government poverty reduction funds (1986-2006)



Social participation

The Chinese Government takes full advantage of the socialist system and mobilizes the whole of society, including coastal provinces and cities, government and party organizations at various levels as well as other social resources to reduce poverty. The following are three examples: (a) 15 developed provinces and cities in the coastal areas were organized by the Central Government to support 11 poor provinces in the west; (b) about 272 Central Government and party organizations and large state-owned enterprises were commissioned to assist 481 state-designated key counties; and (c) social sectors are mobilized to participate in poverty reduction, evidence of which includes the Mission of Glory that mobilizes private enterprise investments in poor areas, and the Project of Hope funded by the China Youth Development Foundation that helps poor students to be educated, etc.

Self-reliance

Apart from all the support from the government and social agencies, the poor farmers are encouraged to work hard and fight against poverty, not just sit idly by and wait for relief. With the spirit of self-reliance and hard work, the poor people have actively participated in the selection, implementation and management process of poverty reduction projects to improve their own living and production conditions.

Development-oriented poverty reduction

The old approach of relief-oriented poverty reduction has been replaced and emphasis has been put on the development-oriented approach, improving living and production conditions in poor areas, increasing the quality and competence of the poor as well as upgrading their capacity for self-development and sustainability.

All-round and co-ordinated development

Guided by a scientific approach to development, poverty reduction is integrated with the development of science and technology, education, health, culture and ecological environment so as to promote the overall progress and sustainable development of poor areas.

Practice of rural poverty reduction

The majority of poor in China rely on agriculture and the rural sector. China's experience shows that the agricultural growth-led development strategy in the 1970s and early 1980s was particularly successful in eradicating large numbers of absolute rural poor.

Initial rapid poverty reduction in China mainly came from rural and agriculture growth, not from a specific anti-poverty programme.

The Chinese economic transition originated from rural economic system reforms. The keys were: to change the rural collective production system into a household individual land contract system; to reform the price mechanism for farm products; and to reform the purchase and sale system. Increases in labour productivity and land productivity, rural industrial diversification as well as the integration of urban and rural product and factor markets induced by the reform became the major driving force of early rural poverty reduction.

Preparing institutional framework for rural poverty reduction

The third plenary session of the 11th Congress of the Communist Party of China (CPC) lifted the curtain for rural reforms. In particular, the five consecutive 'No. 1' documents issued by the Central Committee of the CPC determined the double-tier management system that integrated centralized and decentralized management and recreated micro economic organization in rural areas based on a household contract responsibility system linking remuneration with output. Important institutional reforms included (i) the implementation of a land management system primarily based on a household contract responsibility system, and (ii) the separation of enterprise and government. The land contract system corrected rural production inefficiencies by forming more efficient family-run modes of small-scale peasant economy, improving farmers' initiative in agricultural production, and encouraging them to adopt new technologies and enlarge the scale of investment in land (Figure 4). Accordingly, this increased labour and land productivity, optimized agricultural production modes, accelerated farmers' income growth and finally prompted a rapid decline in rural poverty. According to statistical data, the total output value of agriculture, calculated by constant price, increased by 42.3 per cent from 1978 to 1984, of which over half stemmed from improved production rates because of the new contract system. Moreover, it made the transfer of surplus rural labour to non-agricultural industries possible. Since the 1990s, through agricultural industry integration and the development of farmer-specialized co-operative organizations, China has further improved and enriched the household contract responsibility system to meet the needs of productivity development and the market economy.

Market-oriented price mechanisms and integrative agricultural market operating modes were gradually set up through reforms in the agricultural product system. The elimination of direct governmental control over agricultural goods prices, expansion of the

catalogue of agricultural products which were allowed to be sold in free markets and the elimination of restrictions on market purchases and sales of grain, helped to increase the long-standing undervalued prices of agricultural products in the planned economy period (Figure 5). Farmers began to plan their agricultural production according to market demand. This led to both increased income and improved efficiency of agricultural resource allocation.

Figure 4. Farmer family operation investment (expenditure) and its proportion of total expenditure, and proportion of agricultural productive expenditure of farmer family operation expenditure

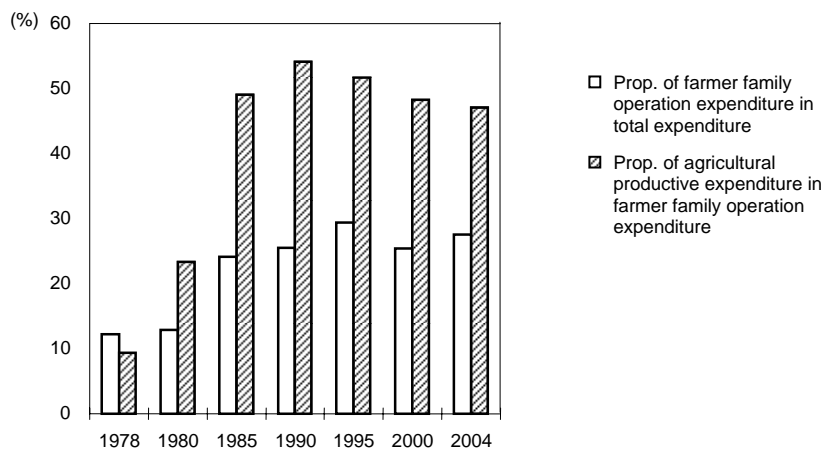
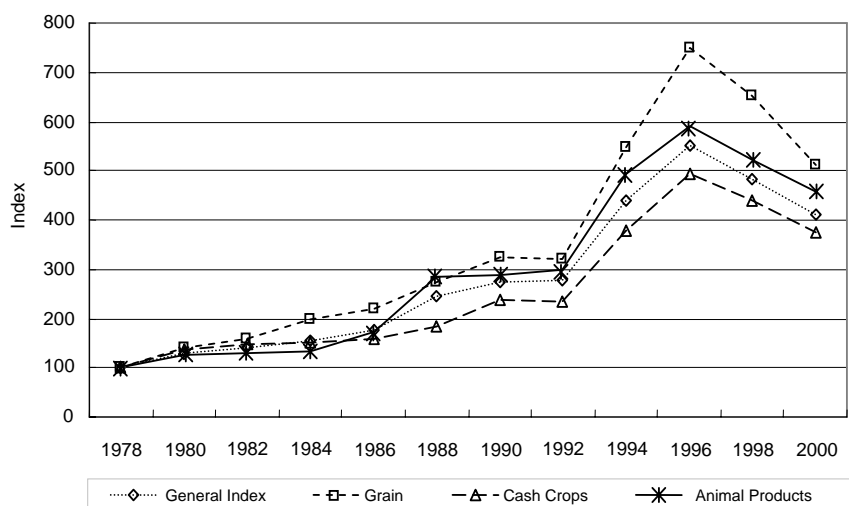


Figure 5. Class index of agricultural product purchase prices in China (1978-2000)

As rural reforms reaped initial success, operation and management system reforms of the national economy immediately followed. This included such measures as the reform of state-owned enterprise, abolishing restrictions on the non-state economy, the introduction of foreign capital, the restructuring of the financial/banking/taxation systems and the application of free market competition. This helped China establish an economic system characterized by market readjustment, dominant resource allocation with coexistent development of diverse economic sectors; removal of barriers between urban and rural markets, and free trade in both production machinery and agricultural products. Adequate supplies of capital goods in the agricultural sector and agricultural machinery have arisen, and agricultural products and surplus rural labour have moved into cities. The operational scope of peasant families and employment opportunities expanded greatly, not only improving agricultural productivity but also increasing farmers' income.

Preparing the economic foundation for rural poverty reduction

Economic growth, especially agricultural growth together with the corresponding industrialization and urbanization in rural areas contributed a great deal to sustaining poverty reduction after the structural reforms. Overall economic growth creates increased demand for agricultural goods and rural labour, industrialization and urbanization (especially the rise of township enterprises and rural private enterprises), and sustains the expansion of cities and the construction of small towns, which widens the scope of non-agricultural

operations and employment. The transfer of farmers from pure grain production to non-grain agricultural operations and non-agricultural operation, together with increased levels of specialized operations, further widens employment opportunities. The employment structure of rural labour has changed greatly as large quantities of rural labour were transferred to non-agricultural businesses locally or in other places. Farmers' incomes continue to rise and the share of income from non-crop production for farming households is rising year after year, becoming the main new source of income. Wages, especially for farmer labourers is the essential factor affecting farmer families' production and consumption.

Establishing the institutional foundation for rural poverty reduction

After more than 20 years of reforms, China made a strategic change from supporting industrial development through agricultural accumulation to an approach in which industry supports agriculture, in order to facilitate the integration of industry and agriculture, and of urban and rural areas. Since the mid-1990s demand for most agricultural products has gone from shortage to surplus, farmers' incomes have increased, and agricultural growth and rural development have depended more on the improvement of integrated production capacity, industrial restructuring and the orderly circulation of products between industry and agriculture. Urban and rural areas urgently required government policy adjustments for agricultural and countryside development. The Chinese Government issued a series of successive policies, which favoured agriculture greatly.

Especially in recent years, China has supported agricultural production with 'four-abolishment and four-support' core policies, i.e. abolishment of agricultural tax, slaughter tax, livestock industry tax and agricultural special product tax, and implementation of direct payment to grain growers, adoption of improved crop varieties, procurement of agricultural machineries, and comprehensive payment for agricultural production materials. Support measures have also been introduced, including: minimum procurement prices for farm products; and incentive policies for major grain producing counties and counties with financial difficulties. These measures gradually increased input in rural infrastructure facilities and social undertakings. The Government established an institutional foundation for industry supporting agriculture. This is an important pillar of policies supporting agricultural production in the new era.

Additionally, in line with the objective of building a harmonized well-rounded, balanced and prosperous society that is socially and economically sustainable, the Chinese Government explicitly proposed the important historical task of constructing a new socialist countryside to promote co-ordinated rural economic, political, cultural and social

development, and Party construction (i.e. 'production development, improvement of living standards, civilized rural codes, orderly villages and democratic management'), in order to improve the production and living conditions and the outlook of entire countryside communities as soon as possible. The major contents of new socialist countryside construction include the development of modern agriculture, increasing farmers' incomes, nurturing new types of farmers, increasing input in agriculture and rural areas, and deepening rural reforms. The strategy of new countryside construction focuses on the overall rural economy and social progress. Progress in new countryside construction and implementation of relevant policy measures will play a significant role in accelerating rural development and providing favourable conditions for poverty reduction for a long period of time to come.

Years of practice show that economic growth or generalized policies alone could not resolve all the problems of poverty. Therefore, since the beginning of the 1980s, the Chinese Government has targeted specific regions to implement a series of special development programmes for poverty reduction. Education and medical health care facilities have been improved, and social security has been strengthened. This targeted approach concentrating on poor areas has improved living conditions, developed human capital, provided income-increasing opportunities and increased production capacity for the poor, strengthening their ability for capital accumulation and self-development.

Challenges and prospects

Despite the remarkable achievements that have been made in poverty alleviation and development, China remains a developing country with relatively low per capita income, and still faces enormous challenges. There is still a long way to go in realizing the target of building a new socialist countryside, a prosperous society and a harmonious socialist society.

The absolute number of the poor population remains large. Currently, there are 21.48 million rural poor people still facing a lack of food and clothing and 35.5 million people with low-incomes in China.

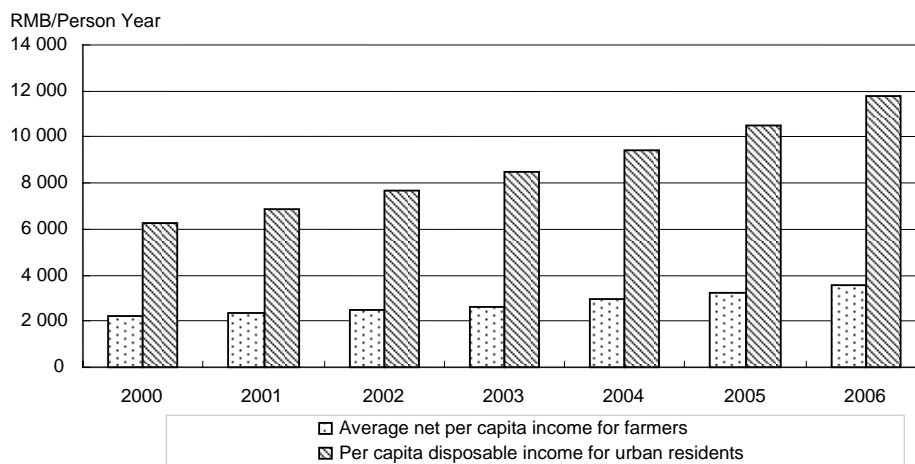
It is getting more difficult to reduce poverty because marginal efficiencies are declining. At present, the poor population is mainly distributed in remote areas where the ecological conditions are harsh and natural resources are scarce. Moreover, labourers in these areas are poorly educated, lack the ability of self-development, and are vulnerable to natural disasters and market risks. Therefore, it has become more difficult and costly to

tackle the issue of lack of food and clothing. The number of rural poor declined by 13.5 million and 5.3 million in the late 1980s and 1990s respectively, but only 1.76 million were lifted out of poverty per year from 2001 to 2006.

The development gap is getting larger. Rapid economic development is causing a growing income gap between urban and rural areas, and between different regions and groups of residents (Figure 6). Therefore, poverty alleviation and development (including solving food and clothing shortages) to narrow the gap between urban and rural areas and different regions must be carried out to promote social harmony. Programmes must be implemented even if it is becoming harder and harder to achieve these goals.

Faced with many difficulties, the Chinese Government maintains its development-oriented poverty alleviation policies. Past experiences and approaches, which have been proven a success, should be continued in the new phase. At the same time, the Chinese Government should be innovative, especially in supporting contemporary trends and allocating more funds for the introduction of advanced technologies to poor areas to further alleviate poverty.

Figure 6. Average per capita income in urban and rural areas



Fostering sound macro environment for poverty reduction and development.

Poverty reduction and development is a long-term historical mission that runs through the whole primary stage of the socialist society. Therefore, public awareness that poverty reduction is a long-term and arduous task should be strengthened in order to help cultivate a social environment that supports those in distress and relieves those in need,

and to support, participate in and push forward poverty alleviation and development causes. At the same time, pro-farmer and agriculture policies should be adopted to promote rural economic development and the overall progress of education, health and culture, thus providing a sound macro environment for poverty reduction.

Implement pro-poor policies

There exists a wide gap between the poor and developed areas in terms of political, economic and social development. By adopting special and tailored regional, industrial and social policies targeted at poverty-stricken areas and populations (such as inputting more funds and technologies), a greater benefit can be achieved from national economic development, and the gap between the poor and developed regions and between the poor and rich be narrowed.

Intensifying specialized poverty reduction programmes

Poverty reduction programmes implemented by specialized organizations should target the poor with more tailor-made measures. Development-oriented poverty reduction should be promoted to improve the self-development abilities of the poor in poverty stricken areas. Reforms and innovations to improve the efficiency of poverty reduction should be maintained.

Poverty Alleviation Programmes in India – A Brief Profile*

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Introduction

Indian poverty reduction through various programmes is well acclaimed at the global level. In the early 1950s, around 50 per cent of the rural population and 35 per cent of the urban population of the country were living below the poverty line. But concerted efforts in reducing the misery of the people through direct poverty alleviation programmes, rural development programmes and the 'Green Revolution' have paid high dividends. According to the latest data released by the National Sample Survey Organization (NSSO) for the year 2004-2005, the poverty ratio at the national level was 21.8 per cent¹. In rural areas, the estimated poverty ratio was 21.7 per cent and in urban areas it was 21.8 per cent (GOI, 2007). A temporal profile of the alterations in the poverty levels in the country is presented in Table 1. The average monthly per capita expenditure of the people has risen steadily over the past three decades, indicating a reduction in poverty. In 1973-1974, the monthly per capita expenditure of rural people was Rs 53 (at current prices), this had increased to Rs 486.2 by the year 1999-2000. For urban people, it had increased from Rs 70.8 to Rs 855.0 during the same period.

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¹ Estimated using Mixed Recall Period.

Table 1. Estimates of poverty at the national level from 1973-1974 to 1999-2000

Year	All India		Rural		Urban	
	Number (million)	Poverty ratio (%)	Number (million)	Poverty ratio (%)	Number (million)	Poverty ratio (%)
1973-74	321	54.9	261	56.4	60	49.0
1977-78	329	51.3	264	53.1	65	45.2
1983	323	44.5	252	45.7	71	40.8
1987-88	307	38.9	232	39.1	75	38.2
1993-94	320	36.0	244	37.3	76	32.4
1999-00	260	26.1	193	27.1	67	23.6

Source: Planning commission.

There have been significant reductions in the levels of poverty in almost all the states (Table 2). Notable declines in poverty levels took place in the states of West Bengal, Tamil Nadu, Karnataka, Kerala and Mizoram between 1973-1974 and 1999-2000 (GOI, 2001b). In West Bengal, people living below the poverty line declined from 73.6 per cent in 1973-1974 to 27.02 per cent in 1999-2000. In Tamil Nadu and Karnataka the poverty ratio declined from more than 50 per cent in 1973-1974 to about 20 per cent in 1999-2000. In Kerala the poverty ratio had been reduced to 13 per cent in 1999-2000 from about 60 per cent in 1973-1974. The poverty ratio was less than 10 per cent in 1999-2000 in the states of Goa (4.40 per cent), Haryana (8.74 per cent), Himachal Pradesh (7.63 per cent), Jammu Kashmir (3.48 per cent), and Punjab (6.16 per cent).

The steady decline in poverty from the mid-1960s to 1980s was strongly associated with agricultural growth, particularly, the Green Revolution (Shenggen Fan *et al.*, 1999). Since the 1980s reductions in poverty have been achieved through a variety of development programmes. During the Green Revolution there was massive investment in agricultural research and rural infrastructure under various development programmes. The introduction of high-yielding crop varieties, chemical fertilizers, large-scale improvements in irrigation, market infrastructure and co-ordinated extension activities contributed immensely to the growth in farm productivity. In the later years, the Green Revolution's effectiveness at alleviating poverty seemed to taper off. With the realization that poverty is multi-faceted and multi-dimensional and not overcome by better income generation alone but also through enhancement of other social indicators such as literacy, sanitation, health, education, etc., the government adopted an augmented approach. More dimensions were added to the development process, giving greater emphasis to employment generation, health, education, gender justice, welfare

and development of backward classes, etc., as well as ongoing investments in the agricultural sector.

Table 2. State wise poverty ratio in India from 1973-1974 to 1999-2000

State	Rural			Urban			Combined		
	73-74	93-94	99-00	73-74	93-94	99-00	73-74	93-94	99-00
Andhra Pradesh	48.41	15.92	11.05	50.61	38.33	26.63	48.86	22.19	15.77
Arunachal Pradesh	52.67	45.01	40.04	36.92	7.73	7.47	51.93	39.35	33.47
Assam	52.67	45.01	40.04	36.92	7.73	7.47	51.21	40.86	36.09
Bihar	62.99	58.21	44.30	52.96	34.50	32.91	61.91	54.96	42.60
Goa	46.86	5.34	1.35	37.69	27.03	7.52	44.26	14.92	4.40
Gujarat	46.35	22.18	13.17	52.57	27.89	15.59	48.15	24.21	14.07
Haryana	34.23	28.02	8.27	40.18	16.38	9.99	35.36	25.05	8.74
Himachal Pradesh	27.42	30.34	7.94	13.17	9.18	4.63	26.39	28.44	7.63
Jammu & Kashmir	45.51	30.34	3.97	21.32	9.18	1.98	40.83	25.17	3.48
Karnataka	55.14	29.88	17.38	52.53	40.14	25.25	54.47	33.16	20.04
Kerala	59.19	25.76	9.38	62.74	24.55	20.27	59.79	25.43	12.72
Madhya Pradesh	62.66	40.64	37.06	57.65	48.38	38.44	61.78	42.52	37.43
Maharashtra	57.71	37.93	23.72	43.87	35.15	26.81	53.24	36.86	25.02
Manipur	52.67	45.01	40.04	36.92	7.73	7.47	49.96	33.78	28.54
Meghalaya	52.67	45.01	40.04	36.92	7.73	7.47	50.20	37.92	33.87
Mizoram	52.67	45.01	40.04	36.92	7.73	7.47	50.20	25.66	19.47
Nagaland	52.67	45.01	40.04	36.92	7.73	7.47	50.81	37.92	32.67
Orissa	67.28	49.72	48.01	55.62	41.64	42.83	66.18	48.56	47.15
Punjab	28.21	11.95	6.35	27.96	11.35	5.75	28.15	11.77	6.16
Rajasthan	44.76	26.46	13.74	52.13	30.49	19.85	46.14	27.14	15.28
Sikkim	52.67	45.01	40.04	36.92	7.73	7.47	50.86	41.43	36.55
Tamil Nadu	57.43	32.48	20.55	49.40	39.77	22.11	54.94	35.03	21.12
Tripura	52.67	45.01	40.04	36.92	7.73	7.47	51.0	39.01	34.44
Uttar Pradesh	56.53	42.28	31.22	60.09	35.39	30.89	57.07	40.85	31.15
West Bengal	73.16	40.80	31.85	34.67	22.41	14.86	63.43	35.66	27.02
Delhi	24.44	1.90	0.40	52.23	16.03	9.42	49.61	14.69	8.23

Source: Planning Commission.

Notes: 1. Poverty ratio of Assam is used for Sikkim, Arunachal Pradesh, Meghalaya, Mizoram, Manipur, Nagaland and Tripura; 2. Poverty line of Maharashtra and expenditure distribution of Goa is used to estimate poverty ratio of Goa; 3. Poverty line of Himachal Pradesh and expenditure distribution of Jammu and Kashmir is used to estimate the poverty ratio of Jammu & Kashmir; 4. Estimates on a 30-day recall basis for 1999-2000.

An important objective of the development planning in India has been to provide increasing employment opportunities to the rural poor who are unemployed as well as to those who are newly entering the workforce. Unemployment reduction strategies advocated in the government's development plan includes special emphasis to promote public investment in rural areas to absorb unemployed labour for asset creation. Large-scale employment was created in various sectors, such as construction, agro-processing and rural

services covering both skilled and unskilled people. Technical and financial assistance, low-interest bank loans, provision of tools, training programmes, etc., were extended and expanded to encourage self-employment for educated youths. In addition to employment programmes, various housing development schemes, infrastructure development schemes, crop insurance schemes, education schemes and food grain distribution programmes were also implemented to address various needs of the rural and urban poor of the country. There were some integrated programmes such as the Integrated Rural Development Programme (IRDP) and Drought Prone Area Programme (DPAP) which aimed at overall development of rural households by providing suitable income generating opportunities through a mix of subsidies and credits to undertake farm and non-farm income generating activities. The Public Distribution Programme (PDS) ensures food security for households in rural and urban areas. Food distribution programmes with high subsidies under the *Antyodaya Anna Yojana* and nutritional security for children under the Midday Meal scheme continue to be important programmes contributing to food and nutritional security in underprivileged areas and societies.

This paper collates various ongoing programmes specifically designed to alleviate poverty. The programmes are broadly classified under six categories: (i) increasing farm income and labour productivity; (ii) employment generation programmes; (iii) rural development programmes; (iv) local area development programmes; (v) transfer of cash and food grains to the poor; and (vi) reducing costs through subsidies and augmenting prices. A list of various poverty alleviation programmes initiated in India since the inception of planned development in the country is presented in Appendix 1.

Programmes aimed at augmenting farm income and labour productivity

Specifically designed anti-poverty programmes to generate both self-employment and wage employment in rural areas were redesigned and restructured in 1999-2000 to enhance their efficiency and sustainability. All these ongoing programmes have been designed with a focus on the provision of basic services for improving the quality of life of the people, to protect the poor from destitution, to reduce the negative impact of sharp fluctuations in employment and incomes and social insecurity (GOI, 2001a). These projects and programmes can be broadly grouped into different categories based on their impact channels. These cover a range of activities like land reform, irrigation development, promotion of high-value commodities such as horticulture, bamboo, fish, plantation crops and agricultural insurance.

Land reforms

Land reforms have been viewed both as a means for achieving redistributive justice and as a means for attaining higher levels of agricultural production and incomes in rural areas. Access to land is still a major source of employment and income in rural areas. Therefore, the issue of agrarian restructuring continues to receive priority. The major components of the Land Reforms Policy include, detection and distribution of ceiling surplus lands, tenancy reforms, consolidation of land holdings, providing access to poor to common lands and wastelands, preventing the alienation of tribal lands and providing land rights to women. For successful land reforms, updating of land records by traditional methods as well as through computerization is an essential prerequisite (GOI, 2001a). Up to 1995, 3 million hectares of land had been declared surplus, out of which 2.66 million ha of land was distributed among 5.03 million landless labourers. Also 76.2 million ha of land have been brought under the process of land consolidation (*Pratyogita Darpan*, 2007). However the progress of this programme has been rather slow. Most of the states have stopped the consolidation programmes and the achievements so far have not been very impressive.

Command Area Development and Water Management Programme (CADWMP)

The centrally sponsored command area development (CAD) programme was launched in 1974-1975 with the main objective of improving utilization of created irrigation potential and optimizing agriculture production and productivity from irrigated lands on a sustainable basis, by integrating all functions related to irrigated agriculture through a multi-disciplinary team under an area development authority. So far, 310 irrigation projects with a Command Area (CCA) of 28.85 million ha have been included under the programme, out of which 133 projects are ongoing. To further strengthen the programme, CAD was restructured and renamed 'Command Area Development and Water Management Programme' (CADWMP) in April 2004. The programme includes execution of on-farm development works such as construction of field channels and drains, reclamation of waterlogged areas, renovation and rehabilitation of tanks, etc. CADWMP also involves other activities such as adaptive trials, demonstrations, training of farmers and evaluation studies (*Pratyogita Darpan*, 2006).

Central scheme on micro-irrigation

A centrally sponsored scheme on micro-irrigation was launched in January 2006 covering a total area of 620 thousand ha. The scheme aims to achieve greater water use

efficiency to enhance productivity and provide better quality produce. During 2006-2007, an Annual Action Plan for 14 States has already been approved pursuant to the guidelines and a sum of Rs 2,794 million had been released to the States up to November 2006. So far the scheme has covered an area of 331 thousand ha (GOI, 2007).

National Horticulture Mission (NHM)

National horticulture mission was launched in May 2005 as a major initiative to bring diversification in agriculture and augment income of farmers through the cultivation of high-value horticultural crops. The programme seeks to double horticultural production by the year 2011, bringing an additional 540 thousand ha under horticulture as well as taking up rejuvenation, quality planting materials, high-tech cultivation, post-harvest management, processing and marketing programmes. Total outlay of the mission is Rs 23 billion during the X plan period (*Pratyogita Darpan*, 2006). Up until December 2006, Rs 5.6 billion had been released (GOI, 2007).

Marine Fishing Policy 2004

The national fishing policy was formulated in 2004. The major thrusts being to augment marine fish production to a sustainable level so as to boost seafood exports and also to increase per capita fish protein intake of the masses. It also aims to ensure the socio-economic security of fishermen whose livelihood solely depends on this profession. The policy ensures sustainable development of marine fisheries with due concern for ecological integrity and bio-diversity (GOI, 2006).

National Bamboo Mission

The Department of Agriculture and Co-operation has launched the National Bamboo Mission with 100 per cent assistance from the Central Government. The total projected cost of this programme is Rs 5.68 billion, including an outlay of Rs 900 million during 2006-2007 (Tenth Plan) and the first four years of the Eleventh Plan (GOI, 2007). The mission aims to popularize new applications for bamboo, including use as wood substitutes and composites, pre-fabricated housing and structures, gasification of bamboo to provide electricity to remote and off-grid locations, and molded products. It also plans to exploit the benefits of micro-propagation in bamboo as an economically viable and cheap method of multiplication.

National Project on Organic Farming

This programme has been designed for production, promotion, and market development of organic farming in the country with an outlay of Rs 570.5 million. It was

formally started in October 2004 with the following components (*Pratyogita Darpan*, 2006);

- putting in place a system of certification for organic produce;
- building capacity of organic farming through service providers;
- providing financial support to commercial production units like fruits and vegetable waste compost units, bio-fertilizer production and hatcheries for vermicompost;
- promoting organic farming for higher returns and improving soil characteristics.

Price Stabilization Fund for Plantation Crops

The Government of India approved a price stabilization fund in 2003 for controlling fluctuations in the prices of tea, coffee, rubber and tobacco. Farmers having holdings up to 4 hectares are covered under this scheme. To stabilize prices, benchmark prices will be determined on the basis of the seven yearly moving average of international price. If the market price deviates from the benchmark price by more than 20 per cent, eligible producers of plantation crops will get relief from this fund. The Central Government will contribute Rs 3 billion for financing this fund (*Pratyogita Darpan*, 2006).

Action plan on enhancing production and productivity of wheat

To enhance the productivity and output of wheat, the Ministry of Agriculture has formulated a three-year rolling plan, targeting about 50 per cent of the area under wheat. A new scheme, 'Enhancing Sustainability of Dry Land Farming Systems', has been formulated keeping in view the commitment of the Government to launch a special programme for dry land farming in the arid and semi-arid regions under the National Common Minimum Programme (NCMP). The proposed scheme aims at addressing issues like rainwater harvesting and its efficient utilization; *in situ* soil moisture conservation; use of organic manures; alternate land use; and adoption of improved dry-land farming technologies (GOI, 2007).

Special Agriculture Production Scheme (*Vishesh Krishi Upaj Yojana*)

The objective of this scheme is to promote export of fruits, vegetables, flowers, minor forest produce and their value-added products by giving incentives to exporters of such products. The exporters of such products shall be entitled for duty scrip equivalent up to 5 per cent of the FOB value of exports for each licensing year commencing from April, 2004. The Central Government's share of funding for the financial year 2004-2005 was Rs 6.95 billion (GOI, 2006).

National Agricultural Insurance Scheme (NAIS)

This scheme has been implemented since June 1999. It was set up to meet the demand to bring more crops under crop insurance and extend its scope to cover all farmers and lower the unit area of insurance. The main objective of this scheme is to protect farmers against losses suffered due to crop failures caused by natural calamities such as drought, flood, hailstorm, cyclone, fire, pest/diseases, etc. The NAIS envisages coverage for all food crops (cereals, millets and pulses), oilseeds and annual commercial/horticultural crops such as sugar cane, potato, cotton, ginger, onion, turmeric, chillies, pineapple, banana, jute, tapioca, coriander, cumin and garlic for which past data on yield is available for an adequate number of years. Cumulatively, 7.51 crore (75.1 million) farmers have been covered under NAIS in the last 12 seasons from *Rabi* 1999-2000 to *Kharif* 2005 (GOI, 2006).

Direct rural employment generating programmes

Unemployment in India is rising despite the launching of several programmes to create employment. Unemployment has increased from 9.02 million in 1993-1994 to 13.10 million in 2004-2005. It was 2.62 per cent of the total labour force in 1993-1994 and 3.06 per cent in 2004-2005 (Table 3). To overcome the problem of unemployment, several programmes were specifically designed to generate employment opportunities for the rural poor to ensure food security and alleviate poverty. Some of these programmes are described below:

Table 3. Employment and unemployment in India (by usual principal status)

Item	Number (million)				Growth (% per year)		
	1983	1993-94	1999-00	2004-05	1983 to 1993-94	1993-94 to 1999-00	1999-2000 to 2004-05
Labour force	277.34	343.56	377.88	428.37	2.06	1.60	2.54
Workforce	269.36	334.54	367.37	415.27	2.08	1.57	2.48
Unemployed	7.98	9.02	10.51	13.10	-	-	-
As a proportion of labour force in percentage							
Unemployment rate	2.88	2.62	2.78	3.06			

Source: GOI (2007) Economic Survey.

Swarnajayanti Gram Swarozgar Yojana (SGSY)

SGSY was conceived in 1999 as a holistic programme of micro-enterprises covering all aspects of self employment with respect to organizing the rural poor into self-help groups

(SHGs) to improve their capacity building, planning of activity clusters, infrastructure build up, technology, access to credit and marketing. Micro-enterprises in the rural areas are established by building on the potential of the rural poor. The objective of the programme is to bring the existing poor families above the poverty line. The scheme is being implemented as a Centrally Sponsored Scheme on a cost-sharing ratio of 75:25 between the Central Government and the States (GOI, 2002). Up to 31 December 2006, 2.44 million self-help groups (SHGs) had been formed and 7.32 million participants had been assisted with a total outlay of Rs164 billion (GOI, 2007).

Jawahar Gram Samridhi Yojana (JGSY)

JGSY was started in 1999 with the primary objective being the creation of demand-driven community village infrastructure, including durable assets at the village level and assets to enable the rural poor to increase opportunities for sustained employment. The secondary objective of this programme is to provide supplementary employment for the unemployed poor in the rural areas. The programme is being implemented on a cost-sharing basis of 75:25 between the Central Government and states (GOI, 2002). Wage employment under the programme is given to Below Poverty Line (BPL) families.

National Rural Employment Guarantee Scheme (NREGS)

NREGS was initiated after the notification of National Rural Employment Guarantee Act in 2005. The programme started in February 2006. The National Food for Work Programme (NFFWP) in which food grains and other resources were supplied in return for manual work was integrated into NREGS from its inception. Another ongoing programme, *Sampoorna Grameen Rozgar Yojana (SGRY)* was also merged into this scheme. The major thrust of the scheme was to provide at least 100 days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work. The scheme is self-selecting in the sense that those among the poor who need work at minimum wage would report for work under the scheme. Of the Rs 113 billion allocated for NREGS in 2006-2007, Rs 67.15 billion was released up to 31 January 2007. Until 31 January, 34.7 million job cards had been issued; and of the 15 million households who had requested employment, 14.7 million households had been provided employment (GOI, 2007).

Drought Prone Area Programme (DPAP)

DPAP aims to minimize the adverse effects of drought on production of crops and livestock and productivity of land, water and human resources ultimately leading to the drought proofing of the affected areas. It also aims at promoting overall economic development and improving the socio-economic conditions of the resource poor and disadvantaged inhabiting the programme areas. This programme was initially launched in 1973-1974 but was modified in 1995 on a watershed basis. So far, up to January 31, 2007, 3,076 new projects covering 1.54 million ha have been sanctioned under DPAP (GOI, 2007).

Desert Development Programme (DDP)

DDP has been envisaged as an essentially land-based activity and conceived as a long-term measure for restoration of ecological balance by conserving, developing and harnessing land, water, livestock and human resources. The main objectives of this programme are: (i) combating drought and desertification; (ii) encouraging restoration of ecological balance; (iii) mitigating the adverse effects of drought and adverse edapho-climatic conditions on crops and livestock and productivity of land, water and human resources; (iv) promoting economic development of village community; and (v) improving socio-economic conditions of the resource poor and disadvantaged sections of village community, namely, the assetless and women. Though formulated in 1977-1978, it was modified so that implementation was on a watershed basis from 1995 onwards. Presently, 235 blocks from 40 districts in 7 states are covered under this programme (*Pratyogita Darpan*, 2007).

Integrated Wastelands Development Programme (IWDP)

IWDP has been carried out since 1989-1990. Under this programme wastelands are being developed with the active participation of stakeholders i.e., user groups, self-help groups and *Panchayat Raj* Institutions. The projects are implemented through the Project Implementing Agencies (PIAs), which can be a Line Department or a reputed NGO having sufficient experience in the field of watershed development. The primary objective of the programme is to bring more land under productive cultivation. In 2006-2007, 463 new projects covering 2.11 million ha were sanctioned under this scheme (GOI, 2007).

Local Rural Welfare Programmes

The Government of India initiated several welfare programmes for housing, sanitation, rural infrastructure, education and women's welfare activities. A brief profile of such programmes is given below:

Bharat Nirman Yojana

Accepting the policy, 'a step towards village union', the Government of India launched a scheme named *Bharat Nirman Yojana* in 2005. The main emphasis of this scheme is developing the rural infrastructure and thus involving the rural poor in the wider process of economic growth. The major six sectors identified in the scheme are irrigation, roads, housing, water supply, electrification and rural communication. The target of the programme is to bring an additional area of 10 million ha under assured irrigation, to connect all villages having a population of 1,000 persons or more with all weather roads, to construct six million additional houses for the poor, to provide drinking water to all inhabitations, to offer electricity connections to 23 million households and to give telephone connectivity to all the villages by the year 2009 (*Pratyogita Darpan*, 2006).

Indira Awas Yojana (IAY)

The *Indira Awas Yojana* (IAY) is a major scheme for construction of houses to be given to the poor, free of cost and upgrading of unserviceable *kutcha* houses to semi *pucca* houses. *Samagra Awas Yojana* (SAY), a similar comprehensive housing scheme was launched in 1999-2000 on a pilot project basis with a view to ensuring integrated provision of shelter, sanitation and drinking water. The underlying philosophy is to provide for convergence of the existing rural housing, sanitation and water supply schemes with special emphasis on technology transfer, human resource development and habitat improvement with people's participation. Up to December 2006, with cumulative expenditure of Rs 292.46 billion, 15.3 million houses had been constructed or upgraded (GOI, 2007).

Valmiki Ambedkar Awas Yojana (VAMBAY)

VAMBAY was launched in 2001 and facilitates the construction and upgrading of dwelling units for slum dwellers and provides a more healthy and enabling urban environment through the construction community toilets. Cumulatively, up to March 2006, Rs 9.36 billion had been released as Central Government subsidy for the construction or upgrading of 4,58,630 dwelling units and 65,331 toilets. For 2006-2007, a Central Government allocation of Rs 750 million has been made to meet the committed liabilities of ongoing projects (GOI, 2007).

Vande Mataram Scheme

This scheme assists pregnant women to minimize complications during pregnancy such as haemorrhaging, anaemia, toxemia, obstructed labour, unsafe abortions, etc. It was started in 2004 as a major public-private partnership initiative. The scheme provides free outpatient services including antenatal check-up for all pregnant women and family planning counselling to new mothers (*Pratyogita Darpan*, 2006).

Janani Suraksha Yojana (JSY)

This programme is a safe motherhood intervention programme with an integrated package of services and cash benefits nationwide. It aims to provide obstetric care services to expectant mothers throughout the pregnancy period, including antenatal care, childbirth and immediate post-partum period through a co-ordinated medical care and delivery system. JSY is a 100 per cent centrally sponsored scheme focusing on both maternal and child health (*Pratyogita Darpan*, 2006).

Rashtriya Mahila Kosh (RMK)

The objective of this institution is to facilitate credit support to poor women to improve their socio-economic status and livelihood. The support is extended through NGOs and women development corporations. The financial assistance extended is totally security free and does not insist on any collateral backing. Since its inception RMK has sanctioned and disbursed loans totalling Rs 1,674 million and 1,268 million respectively benefiting 5.21 million poor women up to March 2005 (*Pratyogita Darpan*, 2006).

Sarva Sikha Abhiyan (SSA)

Sarva Sikha Abhiyan was launched in 2001 as part of an ongoing programme to provide all children between the ages of six and 14 with primary education. It covers the entire country with a special focus on the education needs of girls, SC/STs and other children in difficult circumstances. It also seeks to open new schools in locations which do not have schooling facilities, and strengthen existing school infrastructure through provision of additional classes, toilets, drinking water, etc. SSA addresses the needs of 194 million children between the ages of 6 and 14 years. Up until September 2006, SSA had opened of 164,000 new schools, constructed 281,000 additional class rooms, provided 150 million drinking water facilities, built 193 million toilets, supplied free text books to 57.8 million children and appointed 666,000 teachers (*Pratyogita Darpan*, 2007).

Programmes for Transfer of Cash and Food Grains

Some programmes were also initiated to directly transfer cash as well as food grains to poor and underprivileged groups. These aimed to ensure income security of underprivileged groups and food security for the poor. Salient characteristics of such programmes are given below:

National Social Assistance Programme (NSAP)

The NSAP was launched on 15 August 1995 to provide social and financial assistance to poor households in the case of old age, death of primary breadwinner and maternity. This represents a significant step towards the fulfilment of the Directive Principles in Articles 41 and 42 of the Constitution. The programme supplements the efforts of the state governments with the objective of ensuring minimum national levels of well being. The provision of central assistance seeks to ensure that social protection to beneficiaries is uniformly available. The main features of the three components of the NSAP, (a) National Old Age Pension Scheme (NOAPS), (b) National Family Benefit Scheme (NFBS), and (c) National Maternity Benefit Scheme (NMBS), are given below (GOI, 2001a).

National Old Age Pension Scheme (NOAPS)

In this scheme, an old age pension of Rs 75 per month, per beneficiary is provided to persons of 65 years and above who are destitute in the sense of having little or no regular means of subsistence from their own sources of income or through support from family members or other sources.

National Family Benefit Scheme (NFBS)

A sum of Rs 10,000 is provided in the case of death of the primary breadwinner due to natural or accidental causes. The family benefit is paid to surviving member of the household of the deceased who, after local enquiry, is determined to be the head of the household. The primary breadwinner is defined as a member whose earnings contribute substantially to the household income and who is more than 18 and less than 65 years of age. The bereaved household should qualify as a BPL according to the criteria prescribed by the Government of India.

National Maternity Benefit Scheme (NMBS)

A lump sum cash assistance of Rs 500 is provided to pregnant women of households below the poverty line up to the first two live births provided they are 19 years of age and above. The maternity benefit is disbursed in one installment, 12–8 weeks prior to

the delivery. In case of delay it can be disbursed to the beneficiary even after the birth of the child.

Public Distribution System (PDS)

The Public Distribution System (PDS) of India is, perhaps, the largest distribution network of its type in the world with a network of about 451 thousand Fair Price Shops (FPS) distributing commodities to about 180 million households (GOI, 2001a). The system is designed to help both the producers and consumers of food grains by linking procurement to support prices and ensuring their distribution along with other essential commodities at affordable prices throughout the country. It also stabilizes the prices of food grains by rapidly responding to situations of temporary food shortage through transferring food grains from surplus to deficit areas. PDS, therefore, continues to be a major instrument of the government's economic policy to enhance food security for the poor. The government spends huge sums of money in the form of food subsidies to make food grains available at affordable rates to the masses. The quantum of food subsidy has grown considerably over the past decade. A sum of around 75 billion rupees (0.52 per cent of GDP) was allocated to food subsidies in 1997-1998. This sum had increased more than three times reaching 232 billion rupees (0.66 per cent of GDP) in 2005-2006 (Table 4).

Table 4. Growth of food subsidy in India

Year	Food subsidy (Rs billion)	Annual growth (%)	As % of GDP (1993-2000 base)
1997-98	75.00	23.64	0.52
1998-99	87.00	16.00	0.52
1999-00	94.35	8.45	0.48
2000-01	120.60	27.82	0.57
2001-02	174.99	45.10	0.77
2002-03	241.76	38.16	0.99
2003-04	251.60	4.07	0.91
2004-05	258.00	2.54	0.83
2005-06	232.00	-10.08	0.66
2006-07 (BE)	242.00	4.31	-

Source: GOI (2007), Economic Survey.

This increasing burden of food subsidies on the public exchequer has attracted widespread concern from various quarters. Still PDS should be viewed as an instrument to transfer income to the poor and hence its existence can be justified. A well-targeted and properly functioning Public Distribution System is an important constituent of the strategy for poverty eradication. Food and nutrition security are crucial in our fight against other dimensions of poverty such as infant mortality, maternal mortality, low birth weights and all

other forms of deprivation. PDS was widely criticized for its lack of direction towards the deserving section of the population, urban bias, inadequate coverage and lack of transparent and accountable arrangements for delivery. Realizing this, since 1997 the Government has streamlined the PDS by issuing special cards to families below poverty line and selling food grains under PDS to them at specially subsidized prices under the modified scheme of Targeted Public Distribution System (TPDS). The government is now planning to introduce a food coupon system in order to discourage malpractice in TPDS and to prevent black marketeering. The idea is to universalize the price of food grains to above the poverty line prices and then extend food subsidies to the poor in the form of food stamps worth a particular sum. There will be no limits on entitlements and the poor can choose what to buy. However the planning in this direction is still at the nascent stage and more thought has to go into it before implementation. Currently the food grains are distributed to the poor through two major schemes as outlined below.

Annapurna Yojana

This scheme was introduced in 1999 as a pilot project. It provides 10 kg of food grains to senior citizens at subsidized rates of Rs 2 per kg for wheat and Rs 3 per kg for rice. The scheme is operational in 25 states and five union territories. More than 608 thousand families have been identified as beneficiaries of this scheme.

Antyodaya Anna Yojana (AAY)

This scheme provides food grains at a highly subsidized rate of Rs 2.00 per kg for wheat and Rs 3.00 per kg for rice to the poor families at the rate of 35 kg per family per month under the Targeted Public Distribution System (TPDS).

Midday meal scheme

A National Programme for Nutritional Support to Primary Education (NPNSPE), popularly known as the midday meal scheme was launched in 1995. Food grains are supplied free of cost at the rate of 100 grams per child per school day in cooked form and the meal is served with a minimum content of 300 calories and 8–12 grams of protein each school day for a minimum of 200 days. Raw food grains, at a rate of 3 kg per student per month for 9–11 months of the year, is also supplied under the scheme (*Pratyogita Darpan*, 2006).

Cost Reducing and Price Increasing Programmes

In India, domestic support to producers is provided mainly through input subsidies with an objective to reduce the cost of cultivation. A minimum support prices (MSP) scheme for basic staple commodities provides better prices to producers. These programmes have remarkably increased food grain production that has resulted in achieving food security in the country.

Input subsidies

The three major agricultural inputs being subsidized are fertilizers, electricity and irrigation water. Estimates of input subsidies from 1990-1991 to 2002-2003 are given in Table 5. The Retention Price System (RPS) for fertilizers was introduced in 1977 to insulate farmers from rising prices and to ensure the availability of fertilizers. The difference between the 'retention price' or normal cost of production (plus a 12 per cent post-tax return on investment) and the 'notified sales price' (minus a distribution margin) is paid to manufacturers based on specific plants (Mullen, K. *et al.*, 2005). Originally nitrogenous, phosphatic and potassic fertilizers were included under the price control subsidy programme. However, in 1992 phosphatic and potassic fertilizers were decontrolled. Subsidies on urea during 2005-2006 were estimated at Rs 110.54 billion, and on decontrolled phosphatic and potassic fertilizers at Rs 52 billion. The erstwhile individual unit-oriented RPS in respect of urea had been replaced in stages by a group-based pricing scheme under the New Pricing Scheme (NPS) with effect from April 2003 and April 2004 (GOI, 2006).

Gulati and Narayanan (2003) estimated power subsidy in agriculture on power going to the agricultural sector by calculating the difference between cost of supplying electricity to all sectors and the tariff charged to the agricultural sector multiplied by the quantity of electricity that is reported to be supplied to agriculture. Using this approach, with the caveats that agricultural use may be overstated and electricity suppliers inefficient, they found that the estimated subsidy in 2000-2001 was around Rs 288 billion.

A major irrigation subsidy programme in India currently ongoing is the Accelerated Irrigation Benefits Programme (AIBP) started in 1996-1997 to give loan assistance to the States to help them complete some of the incomplete major/medium irrigation projects which were in an advanced stage of completion. Up to March 2006, under AIBP, the State Governments were provided Rs 194.38 billion as CLA/grant for 200 major/medium irrigation projects and 5,562 Surface Minor Irrigation Schemes (GOI, 2007).

Another minor input subsidy includes the seed subsidy programme. The National Seed Policy of 2001 seeks to provide farmers with superior quality seeds. Under the Seed Bank Scheme, introduced in 1999-2000, seeds are also made available in cases of natural calamity and seed storage infrastructure is to be developed. Grants are provided to participating seed corporations for maintenance of certified and foundation seeds. The government also directs a part of the input subsidy in the form of preferential bank credit to the farmers. The 'Farm Credit Package' announced in June 2004 stipulated doubling the flow of institutional credit for agriculture in the ensuing three years. The target of 30 per cent growth in agricultural credit in 2004-2005 was surpassed by actual growth of 44 per cent in overall credit by all agencies to Rs 1,253.09 billion in 2004-2005. To provide adequate and timely support from the banking system to the farmers for their cultivation needs, including purchase of all inputs in a flexible and cost effective manner, a model Kisan Credit Card Scheme (KCC) was introduced in August 1998 (GOI, 2007).

Table 5. Estimated input subsidies 1990-1991 to 2002-2003

Year	Fertilizer	Power	Irrigation	Total	
	in Rs billion			at current prices	at 2000-01 prices
1990-91	45.6	46.2	25.7	117.5	253.0
1991-92	35.1	58.8	28.7	122.6	231.9
1992-93	32.6	73.4	32.9	138.9	241.7
1993-94	33.5	89.6	34.4	157.5	250.1
1994-95	78.9	112.0	39.5	230.4	334.3
1995-96	96.9	138.4	44.1	279.4	371.8
1996-97	96.3	155.8	44.4	296.6	367.3
1997-98	81.6	190.2	46.7	318.4	369.6
1998-99	83.1	225.0	49.4	357.5	384.5
1999-00	62.1	262.7	52.1	377.0	390.1
2000-01	72.6	288.4	54.9	415.7	415.7
2001-02	67.3	319.8	57.8	444.9	428.3
2002-03	70.0	356.8	60.6	487.3	453.4

Source: Gulati and Narayanan, 2003. Values for 2001-02 and 2002-03 are obtained through trend projections.

Price support policies

The domestic price support policies pursued by the Government of India continued to provide major assistance to the farmers. The commodities covered under this programme

include paddy, wheat, coarse cereals, maize, barley, pulses (i.e. *gram, arhar moong, urad*), sugar cane, cotton, ground-nuts, jute, rapeseed/mustard, sunflower, soybean, safflower, toria, tobacco, copra, sesamum and niger seed (GOI, 2003). The stated objectives of the agricultural price policy are to ensure remunerative prices to farmers, even out effects of seasonality, and promote agricultural diversification, although the guaranteed prices can be below prevailing market prices. MSP levels are determined by the Commission for Agricultural Costs and Prices (CACP). For horticultural and other agricultural commodities not covered by the MSP, there is a Market Intervention Scheme (MIS) of somewhat *ad hoc* support measures. Under the MIS, if the price of a commodity falls below a specific 'economic' level, the Government of India can intervene at the request of the state governments, by purchasing the product at intervention prices that do not exceed the cost of production. The MIS so far has been implemented for commodities like apples, *kinnoo / malta*, garlic, oranges, galgal, grapes, mushrooms, clove, black pepper, pineapple, ginger, red-chillies, coriander seed, *isabgol*, chicory, onions, potatoes, cabbage, mustard seed, castor seed, copra, palm oil, etc. (GOI, 2001b).

Conclusions

Poverty alleviation programmes have always provided great relief to the burgeoning millions of the poor in the country. But targeting government expenditures simply to reduce poverty is not sufficient. Government expenditures also need to stimulate economic growth, to help generate the resources required for future government expenditures. Such growth is the only way of providing a permanent solution to the poverty problem and to increase the overall welfare of rural people (Shenggen, Fan *et al.*, 1999). Therefore the country has resorted to a multi-dimensional approach in resolving the problem by giving emphasis to agricultural productivity improvement, employment guarantee, women and children development, health, infrastructure development, sanitation, insurance, subsidies, etc. While planning the poverty alleviation programmes it has to be taken into consideration that the process should ultimately address human poverty rather than simply addressing income poverty. More clearly, given the structural relations, the role of per capita income in reducing human poverty is rather limited. What matters is that higher per capita income should be translated into higher levels of social infrastructure and government expenditure on social services which in turn lead to a reduction in the levels of human poverty (Prabhu and Kamdar, 2002). Thus a well-balanced strategy, taking lessons from the past, would indeed result in placing the country in a sustainable growth path along with poverty alleviation.

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Annex: Poverty alleviation programmes in India 1951-2006

S. No	Programme	Year of start	Objectives/Description
1.	Community Development Programme (CDP)	1952	Overall development of rural areas with peoples' participation
2.	Intensive Agricultural Development Programme (IADP)	1960-61	To provide loans, tools, fertilizers, etc. to farmers
3.	Intensive Agricultural Area Programme (IAAP)	1964-65	To develop special harvests
4.	High Yielding Variety Programme (HYVP)	1966-67	To improve productivity of food grains by adopting latest crop varieties
5.	Accelerated Rural Water Supply Programme (ARWSP)	1972-73	To provide drinking water to the rural households
6.	Drought Prone Area Programme (DPAP)	1973	To develop drought prone areas by improving ground water resources
7.	Crash Scheme for Rural Employment (CSRE)	1972-73	Rural employment
8.	Marginal Farmer and Agricultural Labour Agency (MFALA)	1973-74	To provide technical and financial assistance to marginal farmers and agricultural labourers
9.	Small Farmer Development Agency (SFDA)	1974-75	To provide technical and financial assistance to small farmers
10.	Command Area Development Programme (CADP)	1974-75	To ensure better use of irrigation capabilities for small and medium projects
11.	Twenty Point Programme (TPP)	1975	Poverty eradication and raising the standard of living
12.	Desert Development Programme (DDP)	1977-78	To control desert expansion and maintain environmental balance
13.	Food for Work Programme	1977-78	Providing food grains to labourers for development works
14.	<i>Antyodaya yojana</i>	1977-78	To make poor families economically independent
15.	Training Rural Youth for Self Employment (TRYSEM)	1979	Programme to train rural youth for self employment
16.	Integrated Rural Development Programme (IRDP)	1980	All-round development for rural poor through a programme of asset endowment for self employment
17.	National Rural Employment Programme (NREP)	1980	To provide profitable employment opportunities to the rural poor
18.	Development of Women and Children in Rural Areas (DWCRA)	1982	To provide self employment opportunities for rural women below poverty line
19.	Rural Landless Employment Guarantee Programme (RLEGP)	1983	To provide employment to landless farmers and labourers

20.	Self Employment to Educated Unemployed Youth (SEEUP)	1983-84	To provide financial assistance to educated unemployed
21.	Comprehensive Crop Insurance Scheme (CCIS)	1985	To provide insurance for agricultural crops
22.	Self Employment Programme for Urban Poor (SEPUP)	1986	To provide subsidies and bank credit to urban poor for self employment
23.	<i>Jawahar Rozgar Yojana</i> (JRY)	1989	To provide employment to rural unemployed
24.	<i>Nehru Rozgar Yojana</i>	1989	To provide employment to urban unemployed
25.	Agricultural and Rural Debt Relief Scheme (ARDRS)	1990	To exempt bank loans of up to Rs. 10,000 for rural artisans and weavers
26.	Scheme of Urban Micro Enterprises (SUME)	1990	To assist the urban poor in small enterprises
27.	Scheme for Urban Wage Employment (SUWE)	1990	To provide wage employment to urban poor
28.	Scheme for Housing and Shelter Upgrading (SHASU)	1990	To upgrade urban shelters and employment generation through it
29.	National Renewal Fund (NRF)	1992	To protect the interests of the public sector employees
30.	Supply of Improved Toolkits to Rural Artisans	1992	To supply modern toolkits to rural craftsmen below the poverty line
31.	Employment Assurance Scheme (EAS)	1993	To provide employment for at least 100 days a year in villages
32.	<i>Mahila Samridhi Yojana</i>	1993	To encourage rural women to deposit in post office savings accounts
33.	Child Labour Eradication Scheme (CLES)	1994	To shift child labour from hazardous industries to schools
34.	Prime Ministers Integrated Urban Poverty Eradication Programme (PMIUPEP)	1995	To eradicate poverty in an integrated manner in selected towns
35.	Midday Meal Scheme	1995	Providing nutritional support to all poor children in primary education
36.	Group life insurance scheme in rural areas	1995-96	To provide insurance facilities to rural people at low premiums
37.	National Slum Development Programme	1996	To redevelop urban slums
38.	<i>Ganga Kalyan Yojana</i>	1997-98	To provide financial assistance to farmers for exploring ground and surface water resources
39.	Kasturba Gandhi Education Scheme	1997	To establish girls' schools in districts with low literacy rates
40.	<i>Swarna Jayanthi Shahari Rozgar Yojana</i> (SJSRY)	1997	Self employment programme for urban poor

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41.	<i>Rajajeswari Mahila Kalian Yojana</i>	1998	To provide insurance protection to women
42.	<i>Annapurna Yojana</i>	1999	To provide 10 kg of food grains to senior citizens without a pension
43.	<i>Swarna Jayanthi Gram Swarozgar Yojana</i>	1999	To eliminate rural poverty and unemployment
44.	<i>Samagra Awas Yojana</i>	1999-00	To provide shelter, sanitation and drinking water in backward areas
45.	<i>Jawahar Gram Samridhi Yojana (JGSY)</i>	1999	To create demand driven community village infrastructure
46.	<i>Jan Sree Bima Yojana</i>	2000	To provide insurance security to people below poverty line
47.	<i>Pradhan Mantra Gramodaya Yojana</i>	2000	To fulfil basic requirements in rural areas
48.	<i>Antyodaya Anna Yojana</i>	2000	To provide food security to rural poor
49.	<i>Ashraya Bima Yojana</i>	2001	To provide compensation to retrenched labourers
50.	<i>Pradhan Mantri Gram Sadak Yojana (PMGSY)</i>	2000	To link all villages through <i>pucca</i> road
51.	<i>Shiksha Shayog Yojana</i>	2001-02	Education of children below poverty line
52.	<i>Sampurna Gramin Rozgar Yojana</i>	2001	To provide employment and food security
53.	<i>Jayprakash Narain Rozgar Guarantee Yojana</i>	2002-03	Employment guarantee in most poor districts
54.	<i>Valmiki Ambedkar Awas Yojana (VAMBAY)</i>	2001	Constructing dwellings in slum urban areas
55.	Social Security Pilot Scheme	2004	Scheme to provide family pension, insurance and medical facilities for labourers in unorganized sector
56.	National Food for Work Programme	2004	Programme to intensify creation of supplementary wage employment
57.	<i>Janani Suraksha Yojana</i>	2005	To provide care to expectant mothers
58.	<i>Bharat Nirman Programme</i>	2005	Development of rural infrastructure: irrigation, water supply, housing, roads, telephone and electricity lines
59.	National Rural Employment Guarantee Scheme (NREGS)	2006	To provide at least 100 days of wage employment in rural areas

Source: Pratyogita Darpan (2006) 'Indian Economy'.

Poverty Alleviation Programmes through Agriculture in Indonesia*

*Tahlim Sudaryanto** and Reni Kustiari****

Introduction

Despite remarkable progress on economic growth, poverty and hunger remain a challenge, particularly for developing countries. Based on the US\$ 1 per day per capita international poverty line, poverty incidence has declined from 1.2 billion (28.6 per cent) in 1990 to 969 million (18.0 per cent) in 2004 (Chen and Ravallion, 2007). Global poverty reductions are largely driven by East Asia and the Pacific. On the other hand, poverty reduction in Sub-Saharan Africa is stagnating: poverty was 46.8 per cent in 1990 and 41.1 per cent in 2004.

The first Millennium Development Goal (MDG) aims to reduce poverty and hunger by half by the year 2015. Since most of the poor live in rural regions and work in agriculture, growth of the agricultural and rural sectors contributes significantly to the reduction of poverty (IFPRI and ADB, 2007). Countries experiencing rapid reduction in poverty are usually those experiencing rapid growth in agriculture and the rural non-farm economy. China and India are always mentioned as phenomenal examples in this matter.

Considering the significant role of agriculture in poverty reduction, it is a great challenge for scientist and development practitioners to formulate a sound policy and programme framework for agricultural development. R&D agencies at international, regional and national level should take a leading role in helping developing countries to formulate effective policies and programmes suitable to each country's specific conditions.

This paper reviews ongoing programmes and activities related to poverty alleviation in agricultural and rural sector in Indonesia. As background, the paper also briefly describes the trends of poverty incidence and strategic policies on poverty alleviation at the national

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level. The later part of the paper outlines some research agendas to support poverty alleviation initiatives in this country.

Trends in poverty incidence

To measure poverty incidence, the Central Bureau of Statistics (CBS) use a basic needs approach (Urip, 2007). By using this approach, poverty line is defined as expenditure required to meet basic needs for food and non-food items. Basic need for food is measured as expenditure required to meet an energy consumption equivalent to 2,100 kcal per day. The basic need for non-food items refers to expenditure required to meet minimum consumption of non-food items (housing, clothing, education, health, etc.). In 2006, the poverty line was equivalent to Rp 152,847 per capita per month or US\$ 1.55 per capita per day. Therefore, Indonesia's poverty line is higher than the international poverty line of US\$ 1 per capita per day. The primary data for this analyses come from the Household Expenditure Survey (Susenas) of CBS.

Based on this indicator, as shown in Table 1, during 1970-1996 poverty incidence declined from 70 million (60 per cent) to 22.5 million (11.34 per cent). At the peak of the economic crisis in 1998, the number of poor people climbed again to 49.5 million (24.23 per cent). Similarly, in 2006 poverty incidence also increased to 39.3 million (17.75 per cent) compared to 35.1 million (15.97 per cent) in 2005, due to the increase of petroleum prices in late 2004. In March 2007, the poverty decreased slightly again to 37.17 million (16.58 per cent). Since Indonesia's poverty line is higher than the international poverty line, poverty incidence would be lower if we used US\$ 1 per day as the criterion.

Poverty is mostly a rural phenomena, because 63.5 per cent of the poor lives in rural areas. Around 64 per cent of the poor work in agriculture, as informal workers (75 per cent), and as unpaid family workers (22 per cent) (World Bank, 2006). Furthermore, 75 per cent of poor people in the agricultural sector cultivate food crops. Disaggregated by region, around 55 per cent of the poor live in Java, similar to the share of the total population in Java, around 60 per cent. Outside of Java, the poverty rate has increased mainly in the province of West Sumatera, Bengkulu, Lampung, Riau, Bali, East Kalimantan, North Sulawesi, Central Sulawesi and South East Sulawesi.

Understanding the characteristics and causes of poverty is an essential part of the poverty alleviation agenda. Poor people usually live in marginal areas such as rainfed, dryland and swampy regions, with complex technical, economic, and social problems (Rusastra and Napitupulu, 2007). With regard to dryland agriculture where many of the poor

live, the problem is characterized by (Dar and Bantilan, 2005): (a) land degradation and scarcity of water; (b) lack of infrastructure and access to technology; (c) malnutrition and migration caused by sporadic drought; (d) lack of opportunity for economic development in agriculture, off-farm and on-farm; and (e) policy impacts such as economic liberalization.

Analyses of Rusastra and Napitupulu (2007) show that poor households usually live in low-quality housing and sanitation. For instance, only 55.6 per cent of the poor households live in a house with a toilet facility, and only 42.1 per cent of them have access to clean water. On the contrary, 75.3 per cent of the non-poor live in a house with toilet facility, and 59.2 per cent of them have access to clean water. In a broader context, Sudaryanto and Rusastra (2006) argued that there are eight elements characterized the poor, namely: (a) inability to meet basic needs (food, clothing, housing); (b) low access to services in education, health, sanitation, etc.; (c) inability to accumulate capital and investment; (d) high sensitivity to external shock (natural, economic and social); (e) low-quality community activities; (g) limited access to productive employment; and (h) inability to work due to physical/mental handicap.

Strategic policies on poverty alleviation

At the national level, poverty alleviation has been placed as one of the high priority agendas. First of all, it is reflected in the 'triple track strategy' in economic development, namely, pro-growth, pro-employment and pro-poor. From a poverty alleviation point of view, the three strategies are interrelated. Rapid and sustained economic growth, which opens up new employment on a massive scale, is a necessary condition to lift more people out of poverty. By putting the three strategies together, it implies and re-emphasizes that growth and new employment should directly benefit the poor. In addition, there is a need to design programmes and activities that are directly targeted to the poor regions and poor families.

In the National Mid-term Development Plan of 2004-2009, there are eight strategic policies, namely: (a) poverty alleviation; (b) increase investment and non-oil exports; (c) increase competitiveness of the manufacturing industries; (d) agricultural revitalization; (e) empowerment of co-operative and small and medium enterprises (SMEs); (f) increase management of state-owned enterprises; (g) increase the capacity in science and technology; (h) improvement labour market conditions; and (i) stabilize the macro economy.

In 2008, the central theme of national development is defined as: 'acceleration of economic growth to reduce poverty and unemployment'. One out of the eight priority policies is increasing the effectiveness of poverty alleviation (Murniningtyas *et al.*, 2007). Other

priority areas which are also related to poverty alleviation initiatives are: (a) agricultural revitalization and rural development; (b) increasing access to health and education; (c) improvement of infrastructure and energy management; and (d) investment, export and job creation.

Agricultural revitalization is accomplished through seven priority policies, namely: (a) increasing the capacity of farmers and farm institution; (b) enhancement of food security; (c) increasing access to technology, processing, marketing and financial services; (d) improving the agricultural business climate; (e) increasing capacity of agricultural management; (f) increasing competitiveness and value added; and (g) increasing efficiency in distribution and marketing. The following strategic directions of the Ministry of Agriculture are nested with the seven priority areas : (a) increasing food production and household access to food; (b) increasing productivity and quality of agricultural commodities; and (c) employment creation and diversification of the rural economy.

With regard to poverty alleviation, at the national level there are five strategies, namely (Ministry of Home Affairs, 2006): (a) expanding opportunities for the poor to meet basic needs and improve standards of living; (b) community empowerment to strengthen economic, political and social institutions, and increase the participation of the poor in the development process; (c) capacity building to increase capacity of the poor in using economic opportunities; (d) social protection for disadvantaged groups; and (e) global partnerships to promote collaboration at local, regional, national and international levels in implementing the first four strategies.

Poverty alleviation projects in agriculture

The Ministry of Agriculture has a long history in conducting project activities specifically designed or related to poverty alleviation, funded by the national budget or supported by international donor agencies. In the following section, we review briefly some key points and lessons learnt from selected projects, namely: (1) Farmer/Fisherman Income Improvement Project (P4K); (2) Participatory Integrated Development in Rainfed Areas (PIDRA); (3) Poor Farmers Income Improvement through Innovation Project (PFI3P); (4) Pilot Project on Acceleration of Agricultural Innovation Dissemination (PRIMA TANI); and (5) Development of Agribusiness in Rural Areas (PUAP). These projects basically belong to the second and third categories of impact channels on poverty alleviation.

Farmer/Fisherman Income Improvement Project (P4K)

The P4K Project supported rural poor people to help themselves by improving their ability to increase their livelihood and the well-being of their families. The target group of this project were landless and marginal or small farmers/fishermen. More specifically, the objectives of the project were: (a) to provide opportunities to the poorest people in rural areas to improve their income-generating capacity; and (b) to raise the living standard of the poorest rural families by promoting activities both on and off-farm through credit.

The main activities of the project are: (a) promoting skill development and micro finance support services; (b) setting up farmers' groups; (c) providing training on financial planning and management; and (c) providing loans to finance productive activities. The loans were disbursed through farmers' groups at market interest rates but without any collateral. The project was conducted in three phases in the period of 1979-2006, and was located in 12 provinces, namely, South Sumatera, Bengkulu, Riau, Lampung, West Java, Central Java, East Java, Bali, West Nusa Tenggara, East Nusa Tenggara, South Kalimantan and South Sulawesi. In addition to government budget, this project was supported by the International Fund for Agricultural Development (IFAD) and the Asian Development Bank (ADB).

Of the 66,663 marginal farmer groups established, 58,118 are still active with total members of 646,681 marginal farmers. Those marginal farmers' groups were scattered in 10,720 villages. Moreover, there were 35 marginal farmers' groups that have been transformed as co-operatives and 205 groups have organized microfinance services.

The project has made progress in poverty reduction by promoting 2.1 million people out of poverty. In addition, the project has also increased farmer capacity to access various public services, including microfinance. The amount of groups' saving in the rural bank (BRI) up to December 2006 was Rp.19.4 trillion and saving in the farmers' groups was Rp. 5.9 trillion.

Some lessons learnt from this project are: (a) marginal farmers are not the 'have not' but the 'have less' people, meaning that poor people have human capital and the ability to self-help; (b) self-confidence is a basic factor in helping them to lift themselves out of poverty; (3) the community approach is an effective instrument in building self-confidence; (4) being a member of the group gives more access to credit services; and (6) microfinance services must be initiated and accompanied by enhancing capacity and empowering the farmers' group in a sustained manner.

Participatory Integrated Development in Rainfed Areas (PIDRA)

The PIDRA project has been designed to develop institutions of the rural poor in the form of self-help groups that work closely with other community-based organizations to manage local resources. Members of the groups can develop their skills, undertake a range of initiatives through collective action, and finally become self-reliant.

The primary objective of the project is to develop the farmer's degree of self reliance. In more specific terms, the objectives of the PIDRA project are: to improve income, food security, and living conditions of low-income households and to promote the conservation and improvement of natural resources.

The beneficiaries of the project are low-income households facing a lot of constraints, that employ traditional farming systems, have fewer farming facilities and have minimum economic capacity. The project has been implemented in 500 villages, in 14 districts, in the provinces of East Java, West Nusa Tenggara (NTB), and East Nusa Tenggara (NTT). Implementation period is 2001-2009, and the project is supported by IFAD.

The project components consist of: (a) community and gender development; (b) agriculture and livestock development; (c) village infrastructure and land management; and (d) institutional support and programme management.

The project activities focus on: (a) integrated regional development through farmer community participation to determine development priorities in improving community welfare; (b) building motivation for capacity enhancement, so that farmers can escape from dependency attitudes in the production process; (c) promoting sustainable agricultural systems (farmer-group systems and gender participation); and (d) strengthening food security in rural areas.

The PIDRA project has shown significant impact on the improvement of the household economy. In general, the changes in economic conditions are: (a) enhancement of the livestock breeding scale; (b) improvement in the economic access of farmers, especially those in remote areas; (c) an increase in household assets; (d) reduction of the level of money borrowing; and (e) improvement of livestock quality.

Poor Farmers Income Improvement through Innovation Project (PFI3P)

This project was designed to address the issue that the welfare of farmers in rainfed areas is generally less than that of farmers in irrigated areas. Technology development in marginal land including rainfed areas is less advanced than that of irrigated areas. Providing incentives to poor farmers may lead to an increase in their incomes if it is accompanied with agricultural production and marketing innovation.

The primary objective of the project is to improve production and marketing innovation in order to increase income and welfare of poor farmers. Specific objectives of the project are: to increase and improve investment in public infrastructure in villages, based on local needs; to support innovation; to increase poor farmer's access to information; and reorientation of agricultural research on rainfed areas. Focused activities include the enhancement of production and development of agribusiness to reduce poverty.

The PFI3P project started in 2003 and will be terminated in 2008. The project sites are the district of Blora (Central Java), Temanggung (East Java), Donggala (Central Sulawesi), East Lombok (West Nusa Tenggara) and Ende (East Nusa Tenggara), covering 1,012 villages. A poor household is defined as a household with land ownership less than 0.1 ha, an average income of less than Rp. 1 million per capita per year, and an inability to afford basic needs.

The project components consist of: (a) poor farmer empowerment through innovation; (b) national and local information resource improvement; (c) agricultural innovation and dissemination support; and (d) project management. This project is financed by an ADB loan.

Some lessons from the implementation of this project are: (a) the limited working capital of poor farmers hinders the achievement of the objectives of the project; (b) information network development did not reach sub-district/village levels, suggesting information dissemination can be done only through leaflet, brochure, poster and electronic files; and (c) information dissemination to agribusiness development centres at village level should be financed by local government funds.

Pilot Project on the Acceleration of the Agricultural Technology Innovation Dissemination (PRIMA TANI)

Agricultural development faces many constraints, such as: (a) new technology is still at an early stage of innovation so that further research and development is needed; (b) a shortage of capital for farmers, leading to poor financial support that will affect the optimal application of new technology; and (c) cultural problems, leading to the introduction of new technology that will not be automatically considered and socially accepted. To overcome such constraints, the Ministry of Agriculture launched an innovative project in 2005 to accelerate dissemination of new agricultural technology innovation. The project is basically the application of a community-based agribusiness development concept with technology innovation as the main driver.

The project has currently been implemented in 201 districts and 32 provinces spread

throughout the country. The PRIMA TANI project is intended to accelerate the transfer and adoption of local specific technology to the farmers. The programme activities include the improvement and development of farm resource management and microfinance institutions to help the limited capital of the farmer and to increase added value and marketing margins of traded commodities. This project is expected to become a field laboratory, and ultimately it will be used as a reference model for development in other villages.

Agricultural technology development of local specific commodities is conducted according to the local potential to accelerate agricultural development in certain regions. The introduction of labour-saving technology and the wide use of specific agricultural machinery have been and will be continually developed and renewed.

Main features of this project are: (a) it is located in rural areas as the smallest units; (b) the action plan was applied using participatory rural appraisal; (c) promoting the self-reliance of the farmer; and (d) using local resources.

The PRIMA TANI project has been accepted and supported by provincial and local governments. To have wider impact, scaling up of this model by local government is necessary.

Project on Agribusiness Development in Rural Areas (PUAP)

The PUAP project is considered to be the breakthrough programme of the Ministry of Agriculture to eradicate poverty and to create new employment in village areas. The project will be implemented in 2008 and the locations are scattered across 33 provinces, 363 districts, 1,834 sub districts and 10,000 poor villages. This project will try to capture lesson learnt from various projects implemented in the past.

The objectives of the PUAP are: (a) to develop agribusiness systems to reduce poverty and unemployment in rural areas; (b) to empower farmers' institutions and the rural economy in agribusiness development; and (c) to promote farmers' economic institutions to become business partners of financial institutions.

The project is purely financed by national, provincial and district government budgets. The project target groups are (1) 10,000 poor villages that have agriculture potential; (2) 10,000 rural economic institutions or their embryos, especially those which are managed by farmers; (3) marginal households or farmers, agricultural labourers or the landless; and (4) agribusiness managed by farmers that have daily, weekly or seasonal transactions.

The project will provide financial support to farmers' groups up to the amount of Rp. 100 million per village. The fund serves as seed money to develop microfinance institutions

which facilitate the farmer to develop various agribusiness activities under guidance of field staff. The guidance relates to aspects of agribusiness planning in accordance to farmer needs and market opportunities.

Research and development to support poverty alleviation

Current research projects

Poverty is a complex and crosscutting issue, involving technical, economic, social, and political factors. Various research agencies at international, regional and national levels have devoted substantial resources to poverty-related research. In the following section, we share some research projects currently underway at the Indonesian Center for Agriculture Socio Economic and Policy Studies.

- a) National Panel of Farmers: Analyses of Agricultural and Rural Development Indicators.

The primary focus of this research project is to analyse dynamic changes of agricultural and rural economies at the village and household levels. At the village level, analysis focuses on demographic aspects, land utilization, occupation and rural institutions. At the household level, the analysis is more detailed and covers demographic characteristics, asset holdings and accumulation, farm costs and returns, the non-farm economy, employment, income, expenditure and institutional aspects. The dataset is very rich in nature, which enables analysts to examine a broad range of subjects, including those related to poverty. This research is planned for the years from 2006 to 2010, in 209 villages scattered in 13 provinces. The sample villages represent various types based on agro-ecosystems, production systems, as well as regional dimensions.

- b) Agricultural and Rural Dynamics: Analyses of Agricultural Census Data: 1963-2003.
Understanding the dynamic role of agriculture is essential in formulating poverty alleviation programmes. The availability of nationwide data from an agricultural census conducted by Central Bureau of Statistics (CBS) in 1963, 1973, 1983 and 2003 are very rich, and enable us to do analyses by both cross-section and inter-census periods. These cover the aspects of demographic change, asset holding (particularly land), employment structure, income and technology. Analyses from this dataset, along with the micro survey data, as described in point (a), will enable us to get a better understanding of the dynamics of the agricultural and rural economy.
- c) A Study on Poverty Gold Standard at the Farm Household Level.

The available indicators for measuring poverty incidence suffer from some weaknesses. For practical purposes, we need to explore alternative indicators that are more accurate and easy to measure based on the available dataset. The primary objective of this research project is to formulate a new Gold Standard of the poverty line related to food, nutrition, agriculture and socio-economic aspects. The research will be conducted in Cianjur district of West Java. Data collected from 200 farm households cultivating horticulture (100) and paddy rice (100).

Future research agendas

As a foundation for formulating sound policy and programmes in poverty alleviation, we need systematic and continuous research work involving many agencies. There are three broad areas of research related to poverty issues, namely: (a) poverty measurement, focused on issues such alternative indicators of poverty, and delineation of the number of poor based on poverty levels; (b) understanding characteristics and causes of poverty, with a specific focus on the excluded groups (marginal and fragile environments, underdeveloped regions, ethnic minorities, etc.); and (c) analyses of policy and programmes on poverty alleviation, in which the primary focus is on analysing the impact of various policies and programmes.

Concluding remarks

Poverty alleviation should be maintained as a central theme on the development agenda, at least until the MDGs have been met. This challenging and complex issue requires participation of a broad range of stakeholders from government, academia, the private sector, civil society organizations, etc. The academic and research community is expected to perform a central role in this initiative.

Lessons learnt from implementing various poverty alleviation projects in the past are: (a) they should be targeted to the poorest segment of the poor; (b) community participation should occur in various stages of the project; (c) financial support is needed to help the poor to conduct activities, but it is not necessarily in full grant; (d) appropriate technical backstopping is required; (e) projects should start with a model at a limited site, then scale up in broader sites.

To support poverty alleviation programmes, systematic research agendas should be conducted involving many agencies. Major research areas should cover: (a) poverty measurement; (b) analyses of characteristics and causes of poverty; and (c) analyses of policy and programmes.

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Annex:**Table 1. Number and percentage of poor people, 1970–2007**

Year	Number of poor people (million)			Percentage of poor people		
	Urban	Rural	Total	Urban	Rural	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1970	-	-	70,0	-	-	60,00
1976	10,0	44,2	54,2	38,79	40,37	40,08
1978	8,3	38,9	47,2	30,84	33,38	33,31
1980	9,5	32,8	42,3	29,04	28,42	28,56
1981	9,3	31,3	40,6	28,06	26,49	26,85
1984	9,3	25,7	35,0	23,14	21,18	21,64
1987	9,7	20,3	30,0	20,14	16,44	17,42
1990	9,4	17,8	27,2	16,75	14,33	15,08
1993	8,7	17,2	25,9	13,45	13,79	13,67
1995	7,2	15,3	22,5	9,71	12,30	11,34
1996	9,4	24,6	34,0	13,39	19,78	17,47
1998	17,6	31,9	49,5	21,92	25,72	24,23
1999	15,6	32,3	47,9	19,41	26,03	23,43
2000	12,3	26,4	38,7	14,60	22,38	19,14
2001	8,6	29,3	37,9	9,76	24,84	18,41
2002	13,3	25,1	38,4	14,46	21,10	18,20
2003	12,2	25,1	37,3	13,57	20,23	17,42
2004	11,4	24,8	36,2	12,13	20,11	16,66
Feb 2005	12,4	22,7	35,1	11,37	19,51	15,97
July 2005	13,30	23,50	36,80	12,48	20,63	16,69
Mar 2006	14,49	24,81	39,30	13,47	21,81	17,75
Mar 2007	13,56	23,61	37,17	12,52	20,37	16,58

Source: Central Bureau of Statistics.

Status of Secondary Crops in the Republic of Korea*

*Woon-Goo Ha and Kang-Su Kwak***

Agricultural statistics of the Republic of Korea

The Korean economy is dynamically changing in the 21st Century and agriculture is also changing greatly. The gross national product (GNP) per capita of Korea increased from US\$ 5,833 in 1990 to US\$ 18,372 in 2006. However, the unemployment ratio also increased from 2.4 to 3.5 per cent. Agricultural gross domestic product (GDP) was 21,736 billion Won, only 2.6 per cent of total national GDP. The number of people employed in agriculture was also lower at 3,304,000 persons down from 14,442,000 in 1970. This corresponds to 6.8 per cent of the total Korean population.

Many factors have negatively affected Korean agriculture. In the late 1990s the International Monetary Fund (IMF) damaged the Korean economy after many investors reduced their investments in Korean industries. Increases in production costs were caused by high land and energy prices. Also, farming became unprofitable due to low consumption of agro-products – an effect of the depressed economy. The former government adjusted policies to lay the foundation for strong agricultural recovery. The vitality of rural communities suffered because of a rapid decline in rural population.

The closing of schools, and poor education facilities forced farmers to abandon their homes and leave rural areas. Insufficient amenities in rural areas hampered the welfare of low-income earners, the aged, and female farmers; and poor cultural and medical conditions limited rural settlement. As a result: rural labour quality rapidly deteriorated; the proportion of aged farmers increased drastically; and ever widening income disparity, emerged. Farmers over sixty years of age increased from 17.8 per cent in 1990 to 40.7 per cent in 2006, and younger farmers aged in their twenties decreased from 31 per cent in 1990 to 6.8 per cent in 2006.

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Unprofitable farming increased and aggravated the income gap between rural and urban households. Agricultural income slowly increased while non-farming income rapidly increased. Ultimately, the ratio of farm and urban household income widened from 97 per cent in 1990 to 78.1 per cent in 2006.

Korean people mostly consumed grains (72 per cent) such as rice, barley, soybean, wheat and corn in 1970 but by 2006, the share of per capita food consumption had changed to 30 per cent for grains, 45 per cent for vegetables and fruits, and 25 per cent for meats and milk.

Table 1. Major economic indicators

Year	Per capita GNP (US\$)	Export (US\$ billion)	Import (US\$ billion)	Unemployment (%)
1970	277	0.9	1.8	1.4
1980	1 598	17.2	21.6	5.2
1990	5 833	65.0	69.8	2.4
2000	10 841	172.3	160.5	4.1
2006	18 372	325.4	309.4	3.5

Table 2. Value of gross domestic product

Year	Total (billion Won)	Agriculture (billion Won)	Percentage of total
1970	2 771	645	23.3
1980	37 032	5 607	15.1
1990	178 628	15 212	8.5
2000	517 096	23 867	4.6
2006	847 876	21 736	2.6

Table 3. Total and agricultural populations

Year	Total (thousand)	Agriculture (thousand)	Percentage of total
1970	32 231	14 422	44.7
1980	38 124	10 827	28.4
1990	42 869	6 661	15.5
2000	47 008	4 031	8.6
2006	48 279	3 304	6.8

Table 4. Farm population by age group (Unit: %)

Year	(%) of total	Under 20	20–49	50–59	Over 60
1970	44.7	53.9	30.5	7.7	7.9
1980	28.4	45.4	34.2	9.9	10.5
1990	15.5	31.6	33.9	16.7	17.8
2000	8.6	17.9	32.3	16.8	33.1
2006	6.8	14.1	27.1	18.1	40.7

Table 5. Rural and urban household incomes

Year	Farm household income ^a (A)	Urban household income ^a (B)	Ratio (A/B)
1970	256	338	75.9
1980	2 693	2 809	95.8
1990	11 026	11 319	97.4
2000	23 072	28 643	80.5
2006	32 303	41 321	78.1

Note: ^a Unit = thousand Won;
Non-agricultural income of farm household = 32%.

Table 6. Per capita consumption of selected commodities^a

Year	Grains	Rice	Vegetable	Fruits	Meat	Egg	Milk
1970	219	136	60	14	5	4	2
1980	195	132	120	22	11	12	11
1990	167	120	133	42	20	17	43
2000	153	94	166	58	32	18	59
2006	137	79	145	62	34	22	64

Note: ^a Unit = kg per capita per annum.

The country produced 4,680,000 mt¹ of rice from 980,000 ha of farmland in 2006. This constituted 93 per cent of total grain production, 32 per cent of agricultural production and 42 per cent of farm receipts for that year. Rice is the most important staple crop of farmers and the people. It is also an integral part of the culture, tradition and social and political stability in the Republic of Korea. Rice policy is the core of Korean agricultural policy.

Barley, soybean, wheat and corn are considered to be secondary crops. Production of barley reached 154,000 mt with a planted area of 58,000 ha in 2006. It comprised only 1.1 per cent of total grain production. Soybean production was 156,000 mt coming from 90,000 ha in the same year. It had a 3 per cent share of total grain production. Wheat production was about 2,000 mt planted on 2,000 ha. Corn production reached 65,000 mt planted on 14,000 ha.

In 2006 rice consumed in Republic of Korea was mostly locally produced (99.4 per cent) as was the majority of barley at 52.8 per cent. Commodities mostly imported were soybean (with only 11.3 per cent domestic production) and corn (with just 0.8 per cent domestic production). As a whole, the grain food self-sufficiency ratio is very low at just 29 per cent. Open global market policies in the 1980s and implementation of WTO agreements

¹ mt = mega ton.

in the late 1990s followed by the Uruguay Round changed Korean agricultural policy. Agricultural products with low prices were increasingly imported and this threatened the domestic market, particularly food/feed grains.

Table 7. Production of secondary crops^a

Year	Rice	Barley	Wheat	Soybean	Corn
1970	3 939	1 590	219	232	68
1980	3 550	811	92	216	154
1990	5 606	416	1	233	120
2000	5 291	163	1	113	64
2006	4 680	154	2	156	65

Note: ^a Unit = 1,000 mt.

Table 8. Area planted in secondary crops^a

Year	Rice	Barley	Wheat	Soybean	Corn
1970	1 203	730	97	295	47
1980	1 233	331	28	188	35
1990	1 244	159	0.3	152	26
2000	1 072	68	1	86	16
2006	980	58	2	90	14

Note: ^a Unit = 1,000 ha.

Table 9. Self-sufficiency ratio of selected commodities

Year	Rice	Barley	Corn	Soybean	Beef	Chicken	Milk
1970	93.1	106.3	18.9	86.1	100	100	100
1980	95.1	57.6	5.9	35.1	93.1	100	100
1990	108.3	97.4	1.9	20.1	52.5	100	100
2000	102.9	46.9	0.9	6.4	52.8	93.5	80.1
2006	99.4	52.8	0.8	11.3	47.9	90.5	69.7

The agricultural policy of the Republic of Korea

The Doha Development Agenda of the World Trade Organization (WTO) negotiated reduced subsidies and tariff barriers among its members. Ninety per cent of subsidies went to the rice industry alone and minimal amounts to competitive secondary crops. Unprofitable farming increased debt, and aggravated the income gap between urban and rural households. China as a WTO member has invaded the Korean market with its low-priced commodities. These conditions were reasons for readjusting Korea's local rice production and secondary crop policies.

The first agricultural policy was directed towards high-quality, high-value and increased export of agricultural products. The policy included the following objectives:

- dominate domestic market with high-quality local produce competing against low-priced, poor-quality imported produce;
- high-quality agriculture refers to the industry that produces differentiated products including produce from environment-friendly agriculture; and
- production of high-value, processed food and non-food, including medicines.

The second agricultural policy was to improve living conditions of rural areas both for farmers and 'green' tourists. The policy included the following objectives:

- remove living standard differences between rural and urban residences;
- make rural areas attractive for urban citizens; and
- generate income to complement agriculture income in rural areas.

Finally, the third agricultural policy was to remove uncertainties in income and farming. The policy included the following objectives:

- expand the incentives for better and multifunctional land uses, such as direct payment;
- remove the income gap and compensate for the disadvantages of agriculture compared with other industries; and
- reinforce training and education programmes to advance technologies and management ability.

New major agricultural policy instruments introduced to assist farmers include:

1. restructuring and adjust existing programmes to comply with the directions of agricultural policies;
2. developing and promote promising new areas;
3. readjusting rice industry policies;
4. promoting export agriculture;
5. systematic promotion of environment-friendly agriculture;
6. advancing agro-marketing systems;
7. consumer-oriented supply of safe foods;
8. urgently addressing farm debt;
9. form safety networks to stabilize incomes;

10. construct crisis management systems and prevent natural disasters;
11. prepare agriculture after reunification; and
12. improve the rural environment for living and well-being.

Secondary crop R&D for poverty alleviation

Barley cultivation and production in the Republic of Korea declined from 2001 to 2005 because of the low purchase ratio of unhulled barley (69 per cent) and rye (53 per cent) as affected by restructuring and adjusting programmes to comply with the directions of agricultural policies. Demand for barley is divided into government purchase and general market circulation. Consumption per person of barley increased from 1.1 kg in 1990 to 1.5 kg in 2005. Moreover, the amount of barley stored increased from 236,000 mt in 2001 to 310,000 mt in 2005. Production of malting barley was 93,000 mt planted on 22,000 ha. Barley self-sufficiency gradually decreased from 29 per cent in 2001 to 27 per cent in 2005. Area planted to whole crop forage barley increased from 859 ha to 9,686 ha in 2006. By 2010, 50,000 ha will be planted in whole crop forage barley. The Farmer-National Agricultural Co-operative Federation-Korea Federation of Livestock Co-operatives Network will commercially sell this to livestock farmers.

Table 10. Planted area, production purchase ratio of barley

Division	Barley type	2001	2002	2003	2004	2005
Planted area (1 000 ha)	Unhulled	14	12	9	9	8
	Rye	48	36	24	27	28
	Malting	29	30	29	24	22
Production (rough grain, 1 000 mt)	Unhulled	50	49	35	38	38
	Rye	222	139	88	120	141
	Malting	111	111	97	91	93
Purchase ratio (%)	Unhulled	65	88	72	68	69
	Rye	79	81	71	64	53
	Malting	72.0	82.9	77.3	85.7	87.1
Government undertaking ratio (%)	Unhulled	95	88	100	100	100
	Rye	20	25	63	39	27
	Malting	-	-	-	-	-

The first R&D policy for poverty alleviation through barley involved processing and product development studies for consumption of barley. Raw barley was processed into local specialized brands, and high-quality raw material barley: malt, barley tea and barley shoot vegetable, among others.

The second R&D policy for poverty alleviation through malting barley was to support development of a special local beer brand. Beer results varied depending on the district where it was produced and quality of the raw malting barley.

Finally, the third R&D policy for poverty alleviation developed whole crop silage barley varieties. Barley in Korea is used as silage instead of food. To breed varieties that are useful for forage production, we are focusing on high biomass and livestock-preferred forage such as the hood, awnless, smooth awn type varieties, and those with high lysine content.

Soman, *Wooho* and *Yuyeon* showed weaker winter hardiness, but better resistance to lodging, shattering, and BaYMV (Barley yellow mosaic virus) than those of check cultivar *Sunwoo* and *Sangweon*. *Soman* is suitable for cropping after rice in central Korea because of its early maturity, which is six days earlier than those of check cultivar *Olbori*. Furthermore, *Soman* has high silage quality and dry matter yield.

Wooho and *Yuyeon* have smooth awn and hood type and were developed in 2005 and 2006, respectively. Hooded and smooth awn types were derived from the artificial cross. The two lines of smooth and rough awn were not significant in growth except in maturing time, while smooth awn lines were better than those of rough ones in silage quality. Recently, our research has focused on the livestock-preferred characteristics of barley such as awnless, hooded, and smooth awn types, and those with high lysine content. For new ruminant-palatable barley cultivars, we developed silage for cattle feed from *Yuyeon*. The experiment showed higher feed concentrate requirements (12.9 kg/day/body, 14 per cent) and daily weight gain (1.46 kg/day, 35 per cent) than those of cattle fed with silage from *Olbori* (common awn). These results showed ruminant-palatable barley with smooth hood, awnless type, and fragile stem is a good source of whole crop forage for breeding.

Figure 1. (a) Awnless type in improving one, (b) heading time of *Soman* and *Sunwoo* (right), and (c) maturing time of *Soman* and *Sunwoo*

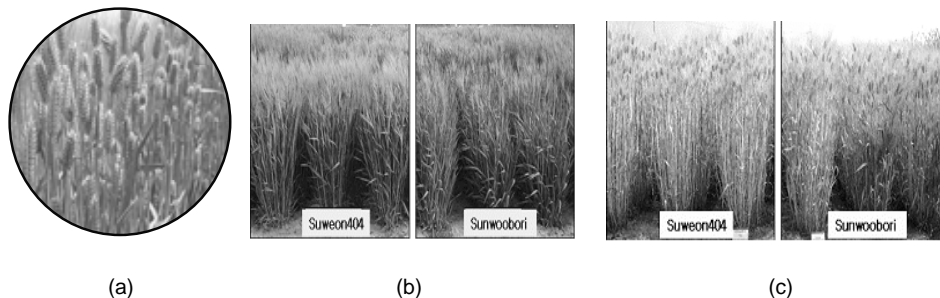
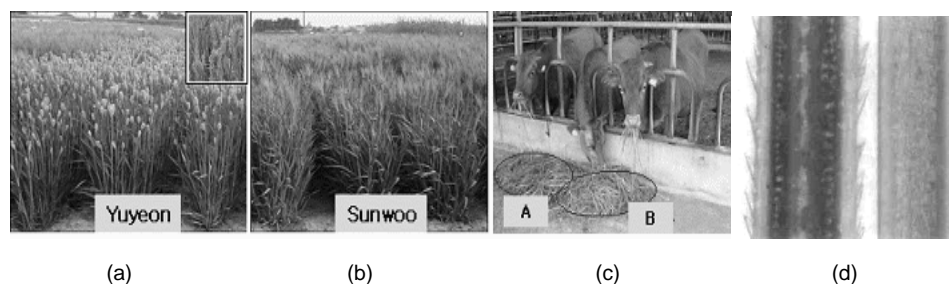


Figure 2. Heading time of (a) Yuyeon and (b) Sunwoo, (c) preference test between (A) rough awn and (B) hood type, (d) magnified shape of rough (left) and smooth awn (right)



Whole barley crops can be ensiled because of their abundant availability for producing highly nutritious silage for cattle feed. This can also reduce the reliance on imported forage and increase the utility rate of cropping systems in rice fields in Korea. Thus, the objective of this study was to investigate the growth, feed efficiency, and carcass characteristics of *Hanwoo* cattle when fed using whole crop barley silage (WCBS) and rice straw silage.

WCBS showed higher moisture content (64 per cent), total digestible nutrient (TDN, 63.6 per cent) and crude protein content (7.1 per cent), and acid detergent fiber (ADF, 32.0 per cent) than rice straw silage (12.3 per cent, 38.2 per cent, 4.4 per cent and 45 per cent, respectively). Cattle fed with WCBS showed higher feed concentrate requirements (3.0 kg/day/body) and daily weight gain (0.86 kg/day) than cattle fed with rice straw silage (2.7 kg/day/body, 0.82 kg/day, respectively). The percentage of first, first+ and first++ grade of *Hanwoo* steers was higher for WCBS (88 per cent) than for rice straw (50 per cent). Marbling score of steers was also higher using WCBS (5.5) than rice straw (3.4), but no significant differences of meat and fat colours were found. These results indicated that whole crop barley silage could be used as an alternative roughage source in the diet of dairy cattle.

Figure 3. The effect of weight gain according to feeding whole crop barley silage for Hanwoo steers (GP – growing period; FP I – fattening period 1; FP II – fattening period 2; and FP III – fattening period 3)

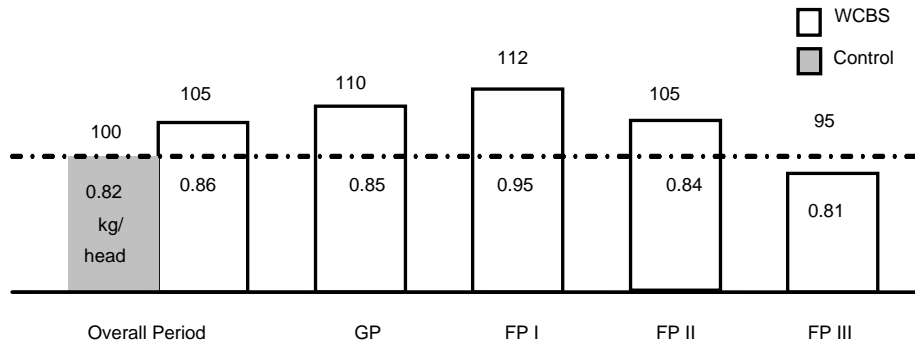
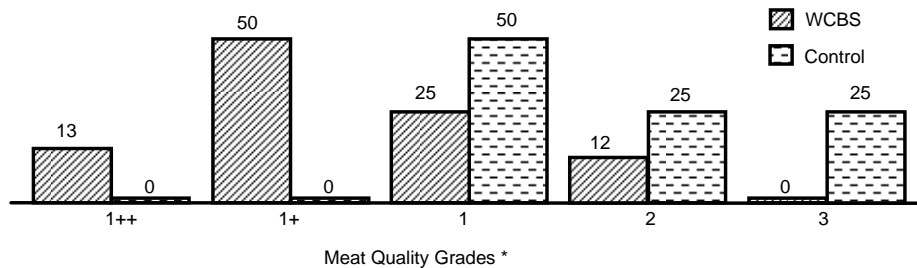


Figure 4. Ratio of meat quality grade of Hanwoo steers (%) (meat quality grades with lower numbers are better quality)



Soybean is the most important secondary crop in the Republic of Korea that has been used as an ingredient in the traditional Korean diet. Soybean production reached 183,300 mt, planted on 104,500 ha in 2005. The planted area has continuously decreased from 188,000 ha in 1980. However, after WTO and the readjustment of Korean rice policies, Korean farmers have been planting soybean in paddy fields instead of rice since 2005 resulting in an increased cultivation area for soybean. Soybean self-sufficiency increased slightly from 6.5 per cent in 2000 to 8.5 per cent in 2005. Importation in 2005 had increased to 1,348,000 mt about 3.2 times more than that in 1980. Another important point is soybean is being increasingly used in animal feed because as the Korean economy has improved, diets have also changed; with meat consumption per capita increasing.

The most important R&D policy for poverty alleviation through soybean as a secondary crop was cultivation in paddy fields that affected mechanization and farming

systems. Korean farmers plant their crops in small size upland fields or the levees of rice paddy fields. These cultivation methods made the introduction of mechanization very difficult.

Planting soybean in paddy rice field initially resulted in an increase in stem length, lodging score, flowering days and maturity date, but a decrease in stem diameter. As the planting density increased, the stem length and lodging score also increased, but stem diameter decreased. The number of pods per unit area, and grain yield of *Taekwangkong* were higher when planted on June 5 with planting density of 16.6 and 19.0 plants/m². *Pungsannamulkong* produced a higher number of pods per unit area and grain yield when planted on June 10 with planting density of 19.0 and 22.0 plants/m².

Table 11. Planted area, production and consumption of soybean

Year	1980	1990	1995	2000	2001	2002	2003	2004	2005
Planted area (1 000 ha)	188	152	105	86.2	78.4	80.8	80.4	85.3	105.4
Production amount (1 000 mt)	216	233	160	113.2	117.7	115.0	105.1	138.6	183.3
Yield capacity (kg/10a)	115	153	152	131	150	142	131	163	174
Self-sufficiency (%)	35.1	20.1	9.9	6.4	7.7	7.3	7.3	7.1	8.5
Self-sufficiency (Except feeding, %)	64.3	64.9	37.0	28.2	28.1	28.5	29.0	25.0	29.8
Consumption per capita (kg)	8.0	8.3	9.0	8.5	8.2	8.4	8.0	8.5	9.0
Import amount (1 000 mt)	417	1 092	1 435	1 496	1 365	1 503	1 535	1 297	1 348

Table 12. Optimum planting time and planting density of soybean in paddy field

Regions	Planting date	Planting density (cm)	Plants/10a
Central	May 20 – June 5	60×20, 70×15	16 600 – 19 000
Southern	June 5 – June 15	70×15, 60×15	19 000 – 22 000

Figure 5. Sowing and growth aspects of soybean in paddy field



Labour saving method by seeder



Field inputted complex technology

The cultivated area of soybean in drained paddy fields is increasing annually. The Rural Development Administration has developed a new cultivation method for soybean in drained paddy fields and has demonstrated the new method. This cultivation method decreases excessive water stress (high ridge method), uses adaptable variety (*Daewonkong*), adjusts suitable planting time and density (early June, 19,000 plants/10a), improves labour-saving planting (seed spacing drill), requires soil testing fertilizer, and identifies proper rotation period (1 year for rice; 3 years for soybean).

Another special project was conducted making a special regional production complex for a new Korean soybean variety, *Daepungkong*. This new variety was high yielding and had good processing properties and increases yield and agriculture income. The success of this variety was made through an expansive dissemination and development of soybean products at Pocheon-City in 2005 and 2006.

Table 13. Comparison of agronomic characteristics

Cultivation type	Planting density (cm)	Stem length (cm)	Lodging (1-9)	Number of branches (no./plant)	100-seed Weight (g)	Seed yield (kg/10a)	Index
New cultivation	52.3	7.4	1.4	41.5	23.2	265	134
Conventional	48.3	7.7	3.7	37.8	22.9	198	100

Figure 6. Stages of soybean production



High ridge-spacing drill

Reproductive stage

Harvesting by combine

The complex was composed of 14 farmers cultivating 10 ha and showed a remarkable average yield of 339 kg/10a in 2005. After evaluation of the field trial during grain filling stage, *Daepungkong* received excellent scores from 80 participants, and also many farmers were interested in this variety. These results were achieved due to the co-operation between the National Institute Crop Science (NICS) and Pocheon-City Agricultural

Technology Service Center (ATSC), the dedicated efforts of members and agricultural co-operatives, and the dissemination of main cultivation technology as practiced by farmers. The main cultivation technology was disseminating high quality seed, applying adequate fertilizer, planting at optimum time and density, topping-off when over grown, co-operative control, and harvesting. In conclusion, our demonstration projects supported farmers needs for crop variety and helped improve agriculture income through adding value from manufacturing soybean products and satisfied consumers' desires for high-quality soybean products.

Figure 7. Aspects of project with new soybean variety



Field evaluation meeting



Daepungkong at R8 stage



Soybean curd

Role of Agriculture in the Alleviation of Poverty in Myanmar*

*San Nyunt***

Introduction

The Union of Myanmar is a large country situated in mainland Southeast Asia, west of the Indochina Peninsula. Myanmar is an agricultural country. The agricultural sector contributes 40.2 per cent of GDP; 12.14 per cent of total export earnings (2005-2006) and employs 61 per cent of the labour force. The total population of the country is 55.4 million (2005), with 82.6 per cent living in rural regions and 17.4 per cent living in urban areas. Most of the rural population depends on agriculture, partially on livestock and fishery sectors and related activities for their livelihood. In recent years general living standards have risen in both urban and rural areas but the majority of the rural population is still poor. The government has invested in rural development and poverty alleviation programmes since 1989 especially in border areas where the ethnic groups are very poor. In some border regions no development programmes could be undertaken due to insurgencies. The government puts poverty reduction through agricultural development as a top priority in its socio-economic development programmes.

As we all know, the basic needs of people are food, clothing and shelter. These needs are served by the agricultural sector, and food production ranks first in terms of importance to people in less-developed countries who still draw their living from agriculture. Most countries in the world seek to increase food production to keep up with population growth, but such production has not kept pace with population in many less-developed countries. Consequently, millions of people suffer from hunger and malnutrition due to food shortages. Food security is one of the big issues of United Nations agencies. The biggest challenge in world agriculture is to increase food production to feed the world's increasing population. There are some indications that there is an urgent need to increase the

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productivity of rural small farmers who comprise the largest portion of the poor of the world. World poverty stems largely from the problems and constraints faced by these millions of small farmers and landless rural labourers. According to a World Bank report (2001), 1.3 billion people worldwide live on less than one US dollar a day. They are under the poverty line according to the internationally accepted definition.

The importance of the agricultural sector in Myanmar's economy and poverty reduction

Agriculture has been a vital part of the Myanmar economy. One of the major economic objectives laid down by the government is to develop agriculture as a base together with development of other sectors of the economy. Agricultural development is often seen as an increase in agricultural production with the same inputs of land, labour and capital. There are five strategies for agricultural development.

1. Development of new agricultural land
2. Provision of sufficient irrigation water
3. Provision and support for agricultural mechanization
4. Application of modern agro-technologies
5. Development and utilization of modern crop varieties.

The agricultural sector makes a major contribution to the country's gross domestic product (GDP). Economic and social development is based on agricultural development.

Agricultural products, primarily rice and rice products, secondary crops such as pulses, maize, rubber, jute and cotton are major export crops. Pulses have been the highest export earner in all years since 1995-1996. Rice is the most important crop in terms of export and domestic consumption and is planted on more than 50 per cent of the total cropping land area. Export earnings from agricultural products accounted for 46 per cent of total exports in 1995-1996. The growth rates of total GDP and agricultural sector can be seen as follows in Table 2.

Table 1. Contribution of the agricultural sector to GDP (%)

Year	Percentage
1985-86	39.7
1990-91	46.3
1995-96	53.2
1997-98	52.1
1998-99	52.3
1999-00	52.2
2000-01	48.8
2001-02	49.0
2002-03	48.3
2003-04	44.9
2004-05	40.2

Table 2. Growth rate of GDP and agricultural sector

Year	Total GDP	Agricultural sector
1985-86	2.9	2.2
1990-91	2.8	2.0
1995-96	6.9	5.5
1999-00	10.9	10.5
2001-02	11.3	8.1
2003-04	13.8	9.3

Table 3. Export earnings of agricultural products (%)

Year	Agricultural products export earnings
1985-86	42.4
1990-91	31.8
1995-96	46.0
1997-98	30.3
1998-99	28.0
1999-00	17.9
2000-01	18.2
2001-02	17.6
2002-03	14.1
2003-04	16.6
2004-05	12.1

Myanmar has abundant land and water resources. In 2003-2004, 19 per cent of total cropping land was irrigated. At present, only about 6 per cent of the total water resources of 870 million acre feet are being utilized annually; only 30 million acre feet of water has been utilized for irrigation purpose up to May, 2007.

Myanmar covers an area of 261 thousand square miles (677,000 square kilometres) and one fourth of the country is cultivable land. At present, there are about 28 million acres of fallow land and 17.78 million acres of cultivable wasteland. Most of agricultural lands are cultivated by small farmers. There is a lot of potential for agricultural development in Myanmar with its abundant natural resources of water and land.

Table 4. Land utilization in Myanmar (2006)

Land category	Area (million acres)
Net sown area	28.03
Fallow land	0.69
Cultivable wasteland	14.48
Reserved forest	41.72
Other forest	41.37
Others	40.59
Total	167.18

The Myanmar agricultural sector has great potential to increase socio-economic growth and to reduce poverty. The strong agricultural base of the economy has provided basic food security to the Myanmar people. Myanmar's strategic plans and programmes for socio-economic development of rural, border and remote areas aims at achieving long-term sustainable growth. Plans are more focused on assistance in favour of the poor and the most vulnerable population of the country. The Ministry of Agriculture and Irrigation has been implementing agricultural development plans to accelerate growth, achieve equitable and balanced development and to reduce the socio-economic development gap between rural and urban areas. The National Development Programmes have seen significant progress achieved in various sectors, such as health, education, infrastructure and agriculture. It is hoped that the achievements resulting from the National Development Plans will meet the Millennium Development Goals (MDGs) targets, particularly to reduce or eradicate poverty.

Main causes of poverty and the rural poverty scenario

Poverty has many faces. It is much more than low income. It also reflects deprivation in health, education, knowledge, communication and transport, inability to exercise human political rights, the absence of dignity, confidence, self-respect and environmental impoverishment. Due to a lack of knowledge about modern agriculture, the poor people in remote areas are dependent on forest products, and practice shifting cultivation for their

livelihoods. The people living in border areas (hilly regions, remote areas) are very poor. No development programmes could be carried out for many years due to problems of militant insurgency. After 1988, 18 insurgent groups returned to the legal fold and made peace with the government so that special projects for Border Area Development could be carried out. Border Area Development was targeted at groups having insufficient resources or income to meet basic needs so that adequate and nutritious food, clothing, housing, clean water and health services were made available. Poverty does not only mean income poverty, but there is also human poverty that encompasses basic measures of human deprivation such as malnutrition, illiteracy and low life expectancy.

Poverty is a widespread phenomenon in rural areas. The majority of the poor are in areas with poor natural resources, tough natural conditions and less developed socio-economic infrastructure. In some areas of Myanmar, especially those border areas dominated by ethnic minorities, poverty rates are very high. They are subsistence farmers with low professional and business skills and with poor access to productive resources (land, capital, technical know-how). Poverty was worse and deeper in these border areas up to 1988.

These are the major causes of poverty in Myanmar. The purchasing power parity (PPP) ratio is an indicator used to measure poverty by international organizations. A household income and expenditure survey (HIES) was conducted in 2001 by the Central Statistical Organization of Ministry of National Planning and Economic Development with a sample size of 30,000 households from 75 sample townships. According to the survey results, the estimated poverty rate was 20.7 per cent for urban, 28.4 per cent for rural areas and 26.6 per cent nationally (MDGs Report, 2005). The Integrated Household Living Condition Assessment Project was jointly implemented by UNDP and Myanmar in 2004. The survey results indicated that the proportion of people below the poverty line at the national level stood at 32 percent (The New Light of Myanmar, 3rd Nov: 2007, p 6).

Policies, strategies and programmes for poverty alleviation

A review of the causes of poverty would suggest that the simplest way of getting rid of it would be to get rid of the causes, but it is 'easier said than done'. Specially designed poverty alleviation programmes have been carried out, such as the Integrated Rural Development Programmes. Special programmes for supervised credit, rural credit and agricultural credit for target beneficiaries given by international non-government organizations (INGOs) have been introduced. Micro-finance is increasingly being

considered as an effective tool for alleviating poverty. Micro-finance provides very poor families with very small loans to help them engage in productive activities or grow their own small businesses. The credit from small loans creates gainful employment for the poor and thereby raises family incomes. Micro-finance helps to improve food and nutrition, health care, education, house renovation and savings levels of the poor.

Poverty Alleviation and Rural Development programmes and projects have been implemented as follows. The government drew up and implemented three National Development Programmes to narrow the socio-economic development gap between urban and rural areas.

1. Border Area Development Programme
2. Plan for 24 special development zones and
3. Integrated Rural Development Plan

Table 5. The main goal of MDGs is to eradicate extreme poverty and hunger

Goal and Target	Indicators
Target 1 Halve, between 1999 and 2015, the proportion of people whose income is less than one dollar a day.	1. Proportion of population below US \$1 per day 2. Poverty gap ratio [incidence x depth of poverty] 3. Share of poorest quintile in national consumption
Target 2 Halve, between 1990 and 2015, the proportion of people who suffer from hunger	4. Prevalence of underweight children (under-five years of age) 5. Proportion below minimum level of dietary energy consumption

The development of border areas and national races

The Border Areas Development Plan was launched in 1989 to fulfil the basic needs of the nationalities residing in remote and border areas. The Ministry of the Progress of Border Areas and National Races and Development Affairs was set up in 1992 and the Ministry took responsibility of border area development in collaboration with other concerned ministries. Priority has been given to the development of agriculture and livestock breeding, transport and communications, education, health and electric power in border areas with the aim to fulfil basic human needs of the peoples living in those areas. Border areas development programmes are being carried out in 18 different regions covering 68 townships where 5.3 million people, mostly ethnic races, reside. The Ministry of Agriculture and Irrigation implemented special programmes for border area development with the following objectives.

1. To become self-sufficient in food
2. To eradicate opium poppy cultivation with crop substitution programmes
3. To increase family income and to get rid of poverty.

With the co-operation of UNDOC 'Wa' border rural area development five-year plan (1998-2003) was successfully implemented at a cost of US\$ 11.62 million and Myanmar Kyats 28.36 million. UNDP and INGOs gave both financial and technical assistance for the border area development. The main functions of the Ministry of Agriculture and Irrigation for border area development are to:

1. implement the annual production-oriented agricultural plans aiming for higher production of crops to ensure food security and to fulfil the basic needs of the rural poor;
2. distribute input supplies to the farmers free of charge;
3. provide quality seeds, seedlings and agrochemicals as necessary (for seasonal crops, fruit trees, horticulture crops, vegetables, flowers, perennial crops, etc.);
4. give agricultural extension education to small farmers (training, hands-on experience);
5. teach farmers to introduce Sloping Agricultural Land Technology (SALT) so that farmers stop shifting cultivation (demonstration and trails);
6. introduce small cottage industries (food preservation techniques and storage methods); and
7. give market information and help farmers to get better prices for their agricultural produce.

Progress in the Border Areas Development Plan can be observed as follows (agricultural sector):

Table 6. Progress in the development activities of border areas (numbers)

Development works	1990-91	2000-01	2001-02	2002-03	2003-04
Agricultural office	0	31	31	31	31
Agricultural stations	0	96	113	115	117
Irrigation projects	24	57	57	57	60
Tractor stations	4	11	11	11	11
Agricultural development projects completed	23	39	40	40	43

The second programme was the implementation of 24 special development zones in States and Divisions. Emphasis was given to education, health and infrastructure advancement of the development zones. More hospitals, colleges and universities were established.

The third programme was the Integrated Rural Development (IRD) Plan. Under the IRD Plan, the following five tasks were undertaken:

1. construction of roads between villages in rural areas to link with urban areas;
2. making water available for people as well as for cultivation of crops;
3. improving and upgrading school buildings and furniture; to improve the education standard and quality of teachers, to enable the children of school-going age to attend classes and become literate;
4. improving rural health care systems; and
5. realizing economic growth for the rural population.

The Ministry of Agriculture and Irrigation achieved the second and fifth tasks by introducing agricultural projects.

1. Secondary crops production projects to complement primary crop, rice.
2. Contract farming, livestock and fisheries sectors
3. Dry zone greening programme
4. Rural water supply programme
5. Irrigation projects

Achievements of the agricultural development programme

Rice production

Table 7. Rice production in Myanmar

Year	Area (million ha)	Production (million mt ^a)
1996	5.88	17.7
1998	5.76	17.1
2001	6.45	21.9
2002	6.49	21.8
2003	6.54	23.1
2004	6.86	24.8
2005	7.39	27.7

Note: ^a mt = mega tons.

Due to increased production of secondary crops, with financial and technical support from the government, international organizations and NGOs, farmers have improved their incomes and productivity.

Secondary crops production

Table 8. Pulses production

Year	Area (million. ha)	Production (mil. mt ^a)
1996	1.96	1.35
1998	2.46	1.66
2001	3.20	2.62
2002	3.27	2.72
2003	3.39	3.05
2004	3.54	3.48
2005	3.81	3.94

Note: ^a mt = mega tons.

Table 9. Cotton production

Year	Area (million. ha)	Production (mil. mt ^a)
1996	3.33	0.17
1998	3.25	0.16
2001	2.95	0.14
2002	3.02	0.14
2003	2.92	0.16
2004	3.06	0.19
2005	3.32	0.23

Note: ^a mt = mega tons

Table 10. Oil crops cultivation (000s acres)

Year	Ground-nut	Sesamum	Sunflower	Mastard	Niger
1996	1 184	2 829	308	44	116
1998	1 242	2 963	848	74	140
2001	1 405	3 416	1 231	137	225
2002	1 435	3 501	1 137	147	231
2003	1 617	3 578	1 262	159	258
2004	1 691	3 696	1 275	166	276
2005	1 805	3 306	1 705	175	318

The government has made heavy investments in the agricultural sector developing over 200 irrigation projects by November 2007 greatly increasing the cropping area under irrigation. Farmers can grow different cash crops more than once per year due to sufficient water supply. Due to double and triple cropping systems in irrigated areas small farmers' incomes have increased leading to an improvement of their standard of living. The

Agricultural Mechanization Department under Ministry of Agriculture and Irrigation helps farmers with land preparation and harvesting in order to grow crops on time.

Conclusion

By implementing agricultural development programmes successfully the number of people living under the poverty line can be reduced. Myanmar has made noticeable achievements in carrying out its National Development Programmes in line with the MDGs. We hope that the achievements resulting from the National Development Programmes, especially by Agricultural Development Programmes, will meet targets 1 and 2 of MDG 1. These targets are:

1. To halve, between 1999 and 2015, the proportion of people whose income is less than one dollar per day.
2. To halve, between 1990 and 2015, the proportion of people who suffer from hunger.

Poverty Alleviation through Agriculture and Rural Development in Nepal*

*Nanda Prasad Shrestha** , Hira Kaji Manandhar, Bhoj Raj Joshi, Dil Prasad Sherchan, Krishna Prasad Paudel and Adarsha Pradhan and Tek Bahadur Gurung****

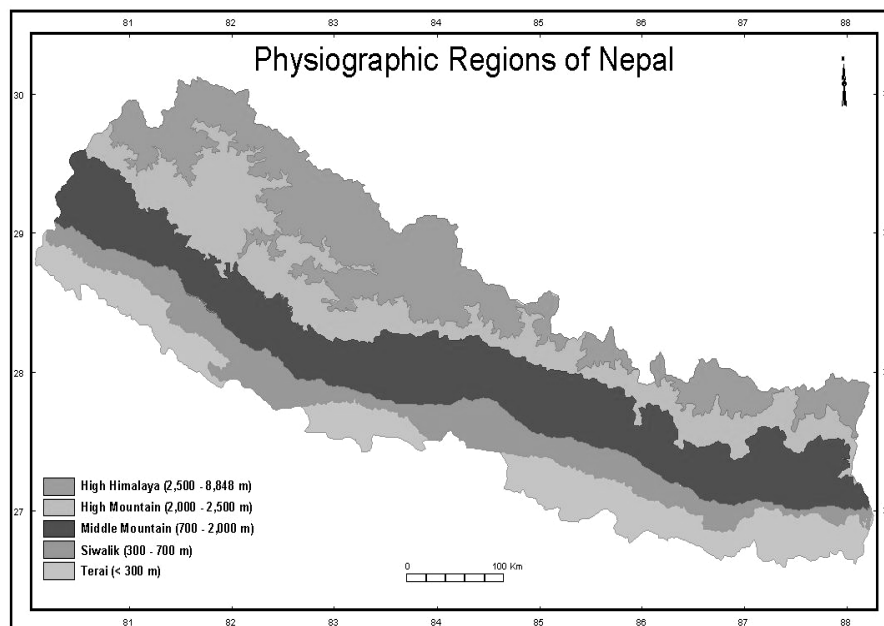
Background

Nepal is a small land-locked agricultural country with two thirds of its population of 26 million engaged in agriculture. Nepal lies between 80° 4' and 88° 12' east longitude and 26° 22' and 30° 27' north latitude and is situated between two big neighbours, China in the North and India in the South. The country is divided into three major ecological regions (Figure 1), mountains, hills and *terai*. The mountain regions cover 35 per cent of the country and are home to 7 per cent of the population. The hill regions cover 42 per cent of the land mass and house 44 per cent of the population, and 49 per cent of the people live on *terai* that makes up 23.11 per cent of the land mass. Nepal covers a total area of 147,181 square kilometres (56,827 square miles). Development planning in Nepal started in 1955 with the first five-year plan and subsequently ten five-year plans have been drawn up and implemented. The first four plans emphasized infrastructure development. From the fifth and sixth plans emphasis shifted towards agriculture and industry. Poverty alleviation was the major objective of the seventh, eighth, ninth and tenth plan periods. To alleviate poverty and attain sustainable food security is a challenge for Nepal. It can be achieved by making a shift from subsistence farming to a commercialized and diversified system of agriculture.

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Figure 1. Physiographic regions of Nepal

Nepal is a natural paradise because of its climate and biodiversity with diverse ecosystems ranging from tropical plains to high Himalayas. With a land mass of less than 0.1 per cent of the earth, Nepal has 2.36 per cent of the world's flowering plants, 8 per cent of all bird species, 4 per cent of known mammals, 184 aquatic fish species, 600 plant families, 500 edible plant species and more than 200 cultivated species (NBS, 2002). The biodiversity of crops, livestock and fisheries is vital to marginalized rural communities for maintaining food security and livelihoods. Rural Nepal, with 86 per cent of the population, has extreme variations in altitude, a complex topography, diverse climatic conditions and integrated farming systems.

The national economy and poverty

Nepal remains as one of the poorest countries in the world with a per capita GDP of US\$ 383 per year (MoAC, 2007). Agriculture, services, small-scale manufacturing industries and tourism, including remittances, are the major sources of income, employment and livelihoods. Industrial activities mainly involve the processing of agro-products. Agriculture contributes to 38 per cent of GDP. Table 1 shows average GDP growth ranging from 2.02 per cent in 2001-2005 to 5.22 per cent in 1986-1990 indicating slower growth due to internal

conflicts. Growth in the agricultural sector, on which the majority of Nepal's poor depend for their livelihoods, was slower than growth in non-agricultural sectors. Major imports include manufactured goods and petroleum products worth about US\$ 1 billion annually. The major export items, worth US\$ 315 million, include woollen carpets and garments followed by some agricultural products such as pulses, jute, medicinal herbs, hides and skins. Niche crops and commodities such as tea, honey, ginger, coffee, off-season vegetables and vegetable seeds have shown high export potential in the recent years.

Table 1. Average GDP growth (at constant prices)

Period	GDP	Agricultural GDP	Non-agricultural GDP
1980-1985	4.70	5.21	3.77
1986-1990	5.22	3.57	6.95
1991-1995	4.88	1.85	7.31
1996-2000	4.73	3.69	5.47
2001-2005	2.02	2.85	2.63

Source: adopted from Bhatta and Sharma (2006).

Nepal Living Standards Survey (NLSS, 2003/2004) showed that poverty declined from 42 per cent in 1996 to 31 per cent in 2004 (Table 2). A three-fold increase in remittance inflows along with higher non-agriculture incomes and agriculture wages, rapid urbanization, and a decline in the fertility rate were major contributors (ADB, 2005). Poverty in Nepal is characterized by wide variations between urban and rural areas, ecological zones, developmental regions, genders, ethnic and caste groups. Nevertheless, poverty in Nepal is largely a rural phenomenon as poverty incidence is much higher (34.6 per cent) in rural areas than in urban areas (9.5 per cent) because of a lack of genuine decentralization in programme planning and implementation as well as imbalances in resource allocation in rural areas. Many poor rural communities have low literacy rates, a lack of employment opportunities, a lack of quality education, inadequate health facilities, inadequate calorie intake, widespread nutritional deficiencies including low levels of prenatal care, and poor access to safe drinking water.

Table 2. Poverty trends in Nepal

Description	MPHBS(1985)	NLSS (1995/96)	NLSS (2003/04)
Nepal	42.5	41.8	30.9
Urban	19.2	21.6	9.6
Rural	43.2	43.3	34.6

Notes: MPHBS: Multi Purpose Household Baseline Survey, Nepal Rastra Bank, 1985. NLSS: Nepal Living Standard Survey, Central Bureau of Statistics, 1996 and 2004.

Poverty in rural and urban areas

The poverty level in rural areas is higher than in urban areas (Table 3). The basic development indicators between rural and urban Nepal indicate that urban people are better off than rural people (Tables 3 and 4). This tendency is reinforced by the ongoing commercialization of rural life, caused by the need for food purchases and the availability of 'urban' consumer goods even in remote areas. The social fabric in rural Nepal is changing because of intensified conflicts. In many areas youths no longer stay in the villages, nor do they engage in agriculture but go abroad in search of alternative employment opportunities. Those who cannot afford to seek overseas employment tend to migrate to India or to towns and cities in Nepal. This has a very important influence on current and future agricultural and natural resources research and development initiatives in Nepal.

Table 3. Development indicators in rural and urban Nepal

Development indicators	2003/04		1995/96	
	Urban	Rural	Nepal	Nepal
Poverty level (%)	9.6	34.6	31	42
Human development indicator (HDI)	0.58	0.45	0.47	n.a
Human poverty index (HPI)	25.2	42	39.6	48.1
Adult literacy rate (15 years and above)	72.8	42.7	48.0	35.6
Life expectancy at birth	n.a	n.a	61	58
Total human (female) fertility rates	2.29	3.82	3.55	5.1
Households with access to electricity (%)	87.4	27.3	37.2	14.1
Households having access to piped water (%)	67.6	39.2	43.9	32.8
Households with access to telephones (%)	31.9	1.1	6.1	n.a

Source: NLSS (2004), HDR (2004).

Note: n.a = not available.

Agriculture and rural development

The agricultural sector represents the highest potential for growth and poverty alleviation, as the majority of people, especially the poor, live in rural areas. The agricultural sector provides opportunities to rural poor people to earn money from urban areas through sales of milk, meat, vegetables, cereals and other crops. It also provides raw materials to the agro-based industries. Because Nepal's economy is largely rural and agrarian, rural development projects focus on small-farmer development through information, training and innovative agricultural technologies, irrigation, community forestry, women's development, drinking water supply and creation of village funds. The projects have been successful to an extent in strengthening sectoral programmes, creating infrastructure (roads, electricity, education and marketing systems) and, consequently, poverty alleviation in the rural

communities. However, the results of such projects have not been very long lasting due to a lack of technical oversight and innovation from appropriate institutions.

Productivity of most crops is far below the yield potential of the crops. Despite the increasing trends of rice, maize, wheat and potato yield, average national production is less than 50 per cent of attainable yield. Two thirds of agriculture is rainfed and largely subsistence in nature (MoAC, 2004).

Recent results of the Nepal Living Standards Survey II (2003-2004) show that there is a large gap between the socioeconomic and agricultural development indicators between people living in rural and urban areas (Table 3). The recent data show significant progress has been made in almost all aspects since 1996-1997. However, the trend of decreasing farm sizes is frustrating as it poses a significant challenge for Nepal's ever increasing population. The agricultural and socioeconomic indicators between urban and rural areas (Table 4) reveals that more rural people have livestock and poultry, and that rural people are dependent on agriculture with much less non-agricultural activity.

Table 4. Agriculture and socioeconomic indicators between rural and urban Nepal

Indicators	2003-04			1995-96
	Urban	Rural	Nepal	Nepal
Agricultural households with land (% of total households)	33.6	86.2	77.5	83.1
Average size of agricultural land (ha)	0.5	0.8	0.8	1.1
Irrigated land area (%)	50.1	54.5	54.3	39.6
Holdings operating <0.5 ha (% of total holdings)	65.0	43.2	44.8	40.1
Holdings operating renting-in land only (%)	8.8	7.2	7.3	4.8
Holdings growing mainly rice (%)	72.7	76.4	76.1	76.0
Holdings growing summer vegetables (%)	55.9	62.9	60.8	35.6
Households with livestock and poultry (%)	4.7	95.3	100.0	100.0
Share of agriculture in employment (%)	30.8	77.3	71.1	82.9
Share of non-agriculture in employment (%)	57.2	13.7	19.5	17.2
Share of agriculture sector in wage employment (%)	3.6	48.1	37.0	53.0
Share of non-agri-sector in wage employment (%)	96.4	51.9	85.0	76.0
Share of farm income in household income (%)	13.0	55.0	47.8	61.0
Share of non-farm and other income in household income (%)	87.0	45.0	52.1	38.0

Source: NLSS (2004).

National plans and policies

Agriculture Perspective Plan (APP)

In 1995, the Nepal government prepared and adopted a 20-year agriculture perspective plan (APP). Implementation began with the Ninth Five Year Plan (1997-2001). The APP envisions increased agricultural production primarily by changing from traditional to science-led agriculture with the integrated use of inputs for high and sustainable growth.

This is a virtual transformation of agriculture from subsistence to commercial with high-value crops and commodities. The APP aims to accelerate agricultural growth with certain priority inputs, including the construction of agricultural roads and rural electrification. Other inputs include irrigation, fertilizers, technology (both research and extension) and credit. Forestry, livestock, high value commodities and agri-businesses have also been given priority outputs.

A review of APP implementation has shown that overall implementation has deviated from the APP guidelines – towards a more favourable stance in some cases but without purpose in many other cases (APP-ISR, 2005). The priority inputs performed dismally while priority outputs did relatively better. A probe into reasons for sub-optimal performance revealed: (i) lack of investment in priority inputs such as irrigation, fertilizers, rural roads, rural credit facilities and rural power including agricultural research; (ii) poor co-ordination among government departments and ministries; and (iii) a lack of clear-cut action plans.

The Tenth Plan's Poverty Reduction Strategy

The Tenth Plan's poverty reduction strategy is based on four pillars: (i) broad-based economic growth; (ii) social sector development including human development; (iii) targeted social inclusion programmes to bring the poor and marginalized groups into mainstream development, together with targeted programmes for the ultra poor, vulnerable and deprived groups (who may not adequately benefit from the first two pillars); and (iv) good governance. All four pillars are essential for improving the lives of the poor, and for mainstreaming the very poor deprived groups, and thus for promoting inclusive development. In implementing the four-pillar strategy, the Plan also stresses strategic cross-cutting approaches with regard to: (a) redefining the role of the State, and limiting public interventions; (b) enlisting the private sector to play a leading role in employment and income generation and together with NGOs, INGOs and CBOs, to complement government efforts in service delivery functions in key areas, as well as in implementing key activities; (c) promoting community participation in and management of activities at local levels; and (d) accelerating the decentralization process, which is also a key element to good governance.

Interim Three Year Plan

After the completion of the Tenth Five Year Plan (1996-1997 to 2006-2007) the Government of Nepal has formulated an Interim Three Year Plan (2007-2008 to 2009-2010) in the context of ongoing political transformation to establish peace and security in the

country. The main objective of this Plan is to realize changes in the life of people by reducing poverty and unemployment and establishing sustainable peace. The primary challenge of the Plan is to give continuity to poverty alleviation efforts and reduce the increasing gap between rich and poor. The policies adopted for poverty alleviation and employment promotion are as follows:

- Investment will be increased for reconstruction, rehabilitation, reintegration and infrastructure development.
- The strategy of inclusive economic growth will favour poverty alleviation.
- Inclusive, targeted and special region programmes will be carried out in various sectors based on both geographical and social groups.
- A system for identifying populations living below the poverty line will be developed with the objective of drawing up targeted programmes to meet the needs of the groups concerned effectively. After identification of target groups, the services and facilities to be provided by the state will be delivered to the groups.
- To improve employment opportunities and lessen under-employment, production-oriented employment will be promoted.
- To create higher incomes, skill development and concessional loans will be provided to youth groups of the poor and targeted groups.
- Subsistence production systems will be made commercial by increasing small-holder savings, enhancing skills and improving the productive use of limited land through co-operatives.

The quantitative targets of major economic, social and infrastructure indices are shown in Table 5.

Table 5. Quantitative targets of the Interim Three Year Plan (2007-08 to 2009-10)

S.N.	Indicator	Up to FY 2006-07	Interim target
1	Economic growth rate (%)	2.5 ^a	5.5
	Agriculture	0.7 ^a	3.6
	Non-agriculture	3.6 ^a	6.5
2	Population below poverty line (%)	31	24
3	Employment growth rate	3.0	3.5
4	Women receiving maternity services from health workers (%)	23.4	34.0
5	Family planning users (%)	48.0	51.0
6	Total Fertility Rate (Females aged 15-49) (%)	3.1	3.0
7	Maternal Mortality Rate (per 100 000)	281	250
8	Infant Mortality Rate (per 1 000 live births)	34	30
9	Child Mortality Rate (per 1 000 live births)	48	42
10	Women's representation in overall state's mechanism, at least (%)	-	33
	Population with access to drinking water (%)	77.0	85.0
	Population with sanitation service (%)	46.0	60.0
	Literacy rate - above 15 years (%)	54.1	66.0
	Net enrollment rate at the primary level (%)	87.4	92.0
	District headquarters with road connectivity (number)	63	75
	Telephone, including mobile (per 100 density)	5.5	20
	Electricity generation (MW)	560	704
	Irrigation (hectares)	1 168 144	1 263 824

Note: ^a Situation in financial year 2006-07.

Role of agriculture sector in poverty reduction

Agriculture research

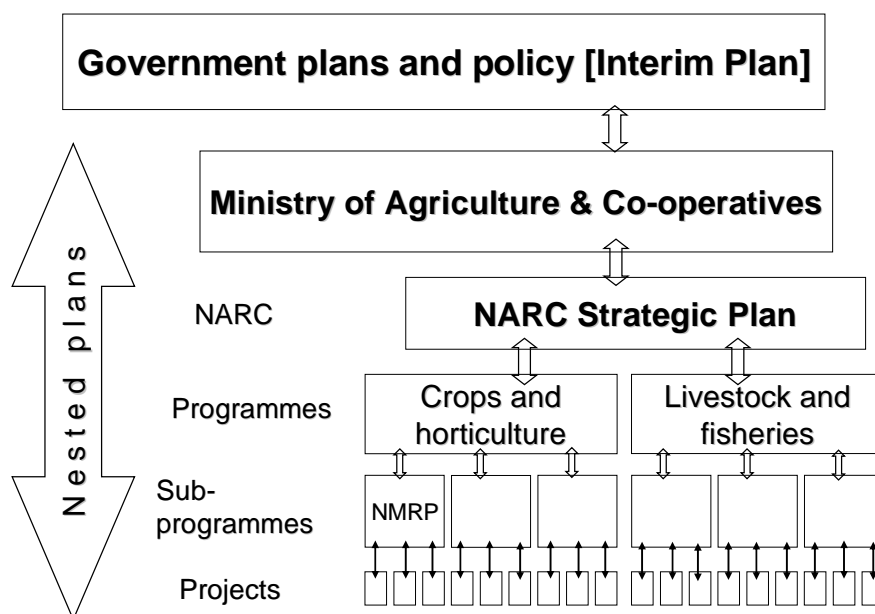
Nepal's modern agricultural research and development era has passed through several phases over the past 50 years. In the past, agricultural research was limited to sectoral and sub-sectoral research. It lacked a coherent, holistic and national system approach and the research remained mainly within the public domain. It was only in 1991 that His Majesty's Government of Nepal, realizing the importance of agricultural research to the national economy, created an autonomous research body, the Nepal Agricultural Research Council (NARC), which is an apex institution for policy-making, co-ordinating and implementing agricultural research in the country.

NARC vision and strategic plan

NARC has developed a 20-year vision (until the year 2021), which outlines a broad strategy for addressing the agricultural research needs of Nepal. The vision provides broad policy guidelines and direction for implementation of the programmes and activities of agriculture, livestock and natural resource research. The NARC plan is nested into

government plans (Figure 2). It is a rolling plan, and will require refinement and modification to address the changing needs of the agricultural research system in Nepal as demanded by the national policies and priorities.

Figure 2. Nesting of NARC programmes and projects with the Government plans and policies

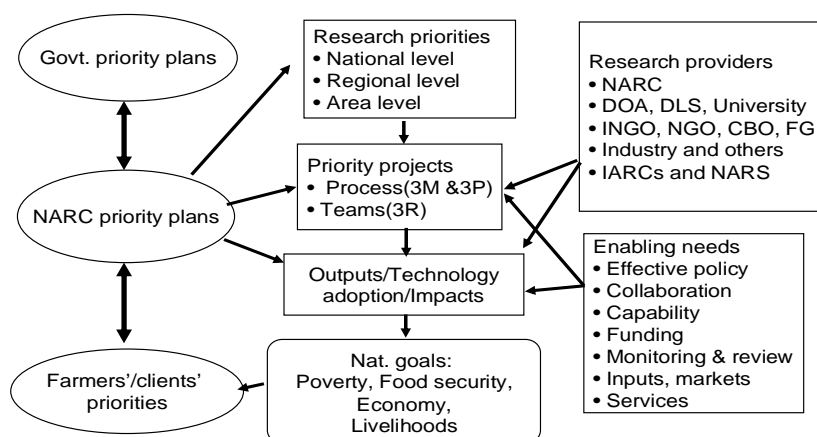


To implement its vision NARC has adopted a strategic plan that includes its goal: to enhance agricultural contribution to livelihoods, especially those of the rural poor. The purpose is: through agricultural technologies, policies and services to better address priority clients' needs with the following five outputs:

- demand-driven and appropriate technologies developed for priority client groups and fed into uptake networks;
- demand-driven agricultural policy, trade, marketing and socio-economic research conducted and fed into uptake networks;
- co-ordination and networking to maximize the impact of enhanced agricultural research;
- mandated direct services delivered appropriately;
- NARC's improved ability to achieve its objectives.

The framework for the National Agricultural Research System (NARS) to achieve set goals at national level is shown in Figure 3.

Figure 3. Framework nesting of NARS for achieving national goals



Research programmes, investment and capability

NARC is implementing over 400 projects annually, including research support and management projects in crops, horticulture, livestock and fisheries sectors across the country (Table 6).

Table 6. NARC research programmes in different sectors

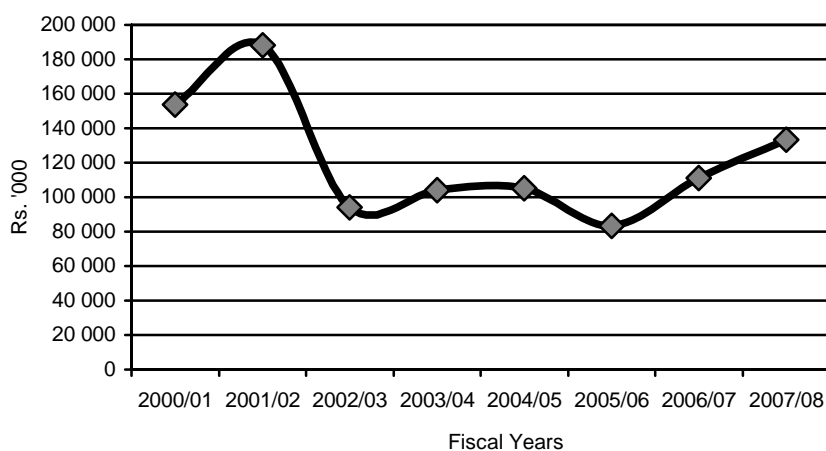
Sector	2004-2005		2005-2006		2006-2007		Average of 3 years		%
	No. proj.	Oper. budget	No. proj.	Oper. budget	No. proj.	Oper. budget	No. proj.	Oper. budget	
Crops	186	32 776	192	39 209	208	45 898	195	39 294	36.0
Horticulture	82	8 784	93	13 487	111	17 303	95	13 191	12.0
Livestock	58	13 363	73	18 987	82	22 737	71	18 362	16.8
Fisheries	39	10 955	41	10 920	44	16 924	41	12 933	11.8
Multisector	61	17 509	74	28 669	77	30 645	72	25 609	23.4
Total	426	83 387	473	111 272	522	133 507	474	109 389	100.0

In spite of being an agricultural country, public investment in agricultural research is very low despite its potential technological contribution to agricultural development and economic growth in Nepal. Present investment is less than 0.20 per cent of Agricultural Gross Domestic Product (AGDP) which is below the international norm of providing at least

1 per cent of AGDP for agricultural research. The operational budget of NARC clearly shows poor or under investment in research in recent years (Figure 4).

At present, NARC has about 400 researchers involved in various research programmes at different research stations located across the country. NARC is working in collaboration with various international agricultural research centres such as CIMMYT, IRRI, ICRISAT, IPGRI, etc. to develop relevant technologies for ensuring food security and reducing poverty. In addition, there are public and private organizations like government departments, universities, academies, NGOs, private laboratories and enterprises, which are involved in agricultural research and development activities.

Figure 4. Operational research budget of NARC



In addition to NARC, agriculture research and development projects are also being funded by the National Agriculture Research and Development Fund (NARDF) to GOs and NGOs on a competitive bidding basis. These projects are generally for two to three years period on priority areas identified by the Technical Committee of NARDF. The Institute of Agriculture and Animal Sciences (IAAS) of the Tribhuvan University also implements research projects.

Agricultural development programmes

Agricultural development programmes and services are mainly carried out by public sector departments like the Department of Agriculture, the Department of Livestock Services, the Department of Co-operatives and the Department of Food Technology and

Quality Control. These departments are also responsible for implementing donor-funded projects on agricultural development and poverty reduction such as Commercial Agriculture Development Projects, Community Livestock Development Projects, Leasehold Forestry Projects, etc. In addition, some other donor-funded projects such as Agriculture Perspective Plan Support Project (APPSP), Western Upland Poverty Alleviation Project (WUPAP) and Western Terai Landscape Complex Project (WTLCP) are being implemented through the concerned ministries.

Non-government organizations are also contributing significantly to agriculture development and poverty reduction in the country. These organizations are mainly dependent on national research organizations for the technologies and inputs (source seeds and materials). It is estimated that there are about 40,000 NGOs and 200 INGOs involved in development activities in Nepal. As rural livelihoods are basically dependent on agriculture, most of these NGOs and INGOs are involved in agriculture and rural development activities.

Poverty alleviation programmes

Transferring cash to the poor

Rural credit availability from formal channels remains limited in Nepal despite the presence of many rural finance institutions as well as the legal and institutional framework being in place for a substantial expansion of rural credit (FAO/WFP, 2007). The formal rural finance sector, supervised or registered with Nepal Rastra Bank (Central Bank of Nepal), includes over 300 rural branches of commercial banks, about 450 branches of the Agricultural Development Bank, the Small Farmers Development Programme with over 130 outlets, several development banks, including the Rural Development Bank, over 30 savings and credit co-operative societies and about 30 microfinance NGOs. In addition, the semiformal sector comprises government-sponsored rural credit programmes, over 1,500 savings and credit societies registered under the Co-operatives Act, and over 50 multi-sector NGOs. The informal sector comprises moneylenders, traders, friends, relatives, as well as thousands of community organizations. Many NGOs operating microfinance programmes also operate outside central bank supervision (FAO/WFP, 2007).

Some of the specific policies adopted by the Interim Plan for transferring cash to poor are as follows:

- Organized agriculture loans will be made easily available for small and poor farmers.
- Agriculture loans will be provided to poor and marginalized at a discount rate.

- The national co-operative bank will float commercial loans and restructuring of capital for the co-operatives.
- A mechanism will be developed to manage in a co-ordinated manner micro-finance, cottage and small industries, and co-operatives.

Increasing farm and labour productivity and increasing incomes

Farm and labour productivity in Nepal are lower when compared to neighbouring countries and this has led to low incomes. Therefore, the foremost objectives of research and development activities are to address this issue to raise the living standards of poor communities. Factors responsible for low productivity are an inherently poor genetic quality of crops and livestock, inadequate and unbalanced inputs, labour-intensive farming, conventional social-economic set-up and poor marketing environments.

Crops

Improved cereal crop varieties with a higher yield potential that are conducive to the local environment and resistant to economically important diseases and pests have been released. So far over 167 improved crop varieties have been released. Rice is the number one staple food crop in Nepal and grown on over 15 million hectares annually. The NARC has released 38 rice varieties for main season cultivation and 11 varieties for early season planting.

Maize is second to rice as the staple food in Nepal. Nineteen varieties, including one hybrid have been released for cultivation in different agro-ecological regions. Innovative new cropping systems have been introduced with better productivity than the conventional system and they have increased farm incomes by increasing cropping intensity. Development of short-duration maize varieties, which are suitable for roasting, is also providing higher incomes. Maize intercropped with green peas and winter vegetables is one of the very intensive cropping systems initiated in the hills (Table 7).

Table 7. Income generation from maize-based intercropping systems

Intercropping	Range of income per ha of land (US\$)
Maize + tomato	3 900 to 4 141
Maize + ginger	2 431 to 051
Maize + soybean	1 174
Maize + beans	1 356 to 1 991

Wheat is the third staple food crop after rice and maize. Planted area, production and productivity is increasing every year. However, the yield is just over 2 mt/ha. Twenty-eight varieties of wheat have been released for different agro-ecological regions. Barley, millet and buckwheat are minor crops overall, but the main crops in mountain and hill regions. Six varieties of barley and three varieties of finger millet have been released to date. The NARC has also been working on other crops such as grain legumes (lentil, cowpea, chickpea, soybean, pigeonpea, blackgram, mungbean), oilseeds (rapeseed, mustard, niger, sesame, ground-nut), and industrial crops (sugar cane, jute, cotton, tobacco).

Currently, the NARC is carrying out research in the followings areas:

- genetic resource conservation, utilization and variety development, including host resistance to insects and diseases;
- integrated crop management, including biological insect, pest and disease control;
- post-harvest processing and value adding;
- mechanization and resource conservation technologies;
- biotechnology;
- research into indigenous knowledge;
- socio-economics and policy research.

Horticulture

Due to the availability of diverse agro-climatic conditions various types of vegetables, fruit, spices and plantation crops can be grown in Nepal. Among the horticultural crops potato is the main staple crop in the mountains, whereas vegetables are the primary crops in the hills and terai areas. Land used for potato cultivation has increased 70 per cent and production is up 123 per cent due to a yield gain of 21 per cent in the last 15 years. The introduction of new varieties and supply of disease-free tubers to the farmers have played a significant role in this higher productivity. In recent years, rice followed by potato has become a very popular cropping system with the added benefit of improving soil fertility because of heavy application of poultry manure for the potato crop. Six varieties of potato have been released for different agro-ecological regions.

All types of vegetables are grown year round in open conditions. Vegetable farming provides about 10 times higher income than cereals. Domestic demand of vegetables is increasing rapidly due to urbanization. Cauliflower, cabbage, tomato, potato, peas, beans and cucurbits are some of the important vegetables. In addition to these a number of indigenous vegetables are also grown by rural people for household income. Vegetables

like tomato, cauliflower, cabbage, radish and peas grown during the rainy and autumn seasons between 800–3,000 metres above sea level are considered off-season vegetables because these vegetables can not be grown in lower areas of Nepal or neighbouring Indian states. Until now, 40 different vegetable varieties have been released in Nepal. Off-season vegetables fetch much higher prices than in-season vegetables. Therefore, vegetable production, especially off-season vegetable production has emerged as a successful enterprise for poor people in Nepal where marketing opportunities are available. Several open pollinated and hybrid varieties have been selected for different seasonal and climatic conditions. About 50 per cent open-pollinated seed varieties are produced domestically whereas all hybrid seeds are imported from other countries. Off-season vegetable production pockets have been developed along north-south roads at varying altitudes. Farmers' groups have been formed with technical support from government agencies and NGOs. Most of the off-season production is exported to Indian markets in nearby states such as West Bengal, Bihar and Uttar Pradesh. Presently the NARC is conducting research on variety improvement, organic farming, production under plastic housing, post-harvest management, etc. River bank vegetable production during winter and dry season when river water is reduced or riverbeds are dried out has been found suitable for landless people. These schemes have been found effective to improve the economic condition of the poor.

Apples have been identified as a priority crop for high mountain regions. Temperate fruits cover an area of 20,000 hectares of which 33 per cent is apple orchards. Two horticulture research stations with major emphasis on apple research and development were established about 40 years ago in mountainous regions. Various exotic varieties were introduced and evaluated for their performances at research stations and in farmers' orchards. Different varieties and technologies have been recommended. New roads joining major apple growing areas of the country are under construction. These will soon provide market outlets for apple production and further encourage apple production, which will reduce rural poverty in the western mountain region of Nepal as experienced in Pakistan and India (Himachal Pradesh).

The mid-hills regions of Nepal between 800–1,400 metres in altitude are very suitable for citrus especially mandarin, sweet orange and lime cultivation. At present citrus orchards occupy about 26,000 ha and area under citrus cultivation is increasing by 1,000 ha annually. Productivity is low (10.7 tons/ha) compared to about 14 tons/ha average in Asia. Citrus in Nepal is cultivated on rainfed hilly terraces and slopes where cultivation of other cereals is not profitable. Mandarin cultivation is 5–10 times more profitable than cereal

production. The cost benefit ratio is 1:4 for mandarin as compared to 1:2 for field crops (Shrestha and Shrestha, 2004). Since most of the rural poor own unirrigated upland, replacement of cereals by citrus has helped significantly to improve their economic condition. Citrus cultivation, especially mandarin farming, in the hills of Nepal is a profitable production option because of its agro-ecological suitability, high value nature and seasonal advantage for growing it in fragile and marginal hill slopes and terraces. Development and improvement of technologies such as selection of elite genotypes from local and exotic genotypes, improvement of nursery management systems, nutrient management, insect and disease management and reduction of post-harvest losses are being carried out by the Nepal Agricultural Research Council with a major focus on improvement in productivity and quality of fruits and reduction of production costs. Presently, harvest season for citrus in Nepal is very narrow (November–January). Moreover, production in old orchards is rapidly declining mainly due to greening disease. So, variety diversification through selection and dissemination of early and late maturing varieties as well as management of citrus decline is undertaken so as to increase the profitability of citrus fruit crops.

Coffee, well adapted to the climate of middle hills in Nepal, is emerging as one of the potential crops to provide rural farmers with on-farm employment and income. Superior highland organic coffee for niche export markets can be produced at an altitude higher than 800 metres. However, being a new crop to Nepal, coffee production and processing technologies are still in a rudimentary stage. Considering its potential for poverty reduction of rural hill people, both government and non-government organizations have initiated research and development works on coffee. Coffee plantations have increased from 136 ha in 1995 to 1,078 ha in 2005 (Shrestha, 2007).

Large cardamom and zinger are two other horticultural commodities that play a very vital role in poverty reduction for hill people. Nepal is probably the highest producer (6,600 mt) of large cardamom in the world with nearly 90 per cent exported to international markets. This crop is mainly cultivated in the eastern hills of Nepal on marginal land under the shade of *Alnus nepalensis* on both private and public land. Degraded government forests are provided to organized groups of landless and poor growers so that they can earn additional income cultivating cardamom. Large cardamom makes up about 0.90 per cent of total exports of Nepal (Shrestha *et al.*, 2004). Despite expanding areas of cultivation and increasing production, the productivity of the crop has decreased in recent years due to various viral and fungal diseases. Zinger is the crop of poor people and mainly grown for export. It is either intercropped with maize or grown as a sole crop on marginal hill land

without any application of chemical fertilizer and pesticides (Sharma, 2003).

Currently, the NARC is carrying out projects in the following horticultural areas:

- genetic resource conservation, utilization and variety development, including host resistance to insects and diseases;
- true potato seed;
- tissue culture;
- integrated crop management, including IPM and IDM emphasizing environment-friendly management practices;
- organic farming;
- pesticide residue;
- vegetable intercropping in orchards;
- post-harvest processing and value adding;
- socio-economics and policy research.

Livestock

Technologies to increase the production of milk and meat at the household level have been introduced. Breed improvement programmes along with health and nutrition improvement through participatory approaches has increased milk yields by 70 per cent. Improved technologies have increased goat productivity significantly.

Under leasehold forestry programmes, poor people obtained degraded land on lease to produce forage and forage seeds. This generated household incomes of NRs 5,000–10,000 per ha per year. Intensification of community seed production programmes were also introduced and these programmes enabled rural subsistence farmers to become commercial producers. Fifty to sixty thousand ha of degraded lands were made available for fodder and forage production of which only 15 per cent was cultivated for fodder and forage.

Currently, the NARC is carrying out livestock projects on the followings areas:

- genetic resource conservation, characterization, selection, utilization and breed improvement;
- establishment of elite herds;
- low-cost feeding and feed supplementation;
- pasture and forage;
- disease epidemiology and control strategy;
- post-harvest processing and value adding;

- biotechnology;
- socio-economics and policy research.

Fisheries

Rice-fish culture technology under Nepalese conditions has been developed. The technology increased rice production by 12 per cent and provided a harvest of 500 kg of fish per hectare. Caged fish farming has also been practised in lakes. A complete technology package for producing rainbow trout in cold water conditions in hill regions has been developed and successfully promoted. Breeding technologies for some native fish species have also been developed.

Currently, the NARC is carrying out fisheries projects on the followings areas:

- genetic resource conservation, utilization and breed improvement;
- breeding technologies;
- production technologies;
- fish health and vaccination;
- biodiversity;
- biotechnology;
- socio-economics and policy research.

Some of the policies for increasing farm and labour productivity and income in agriculture by the Interim Plan are as follows:

- Co-operative agriculture will be encouraged to raise the living standards of marginalized farmers.
- Access of information technology in rural regions will be increased by mobilizing the private information technology sector.
- People's standard of living will be increased through development, improvement and use of science and technology.
- The Agriculture and Forestry University will be established to meet the needs of the agriculture research sector.

Local agriculture economics within the wider process of economic growth

There are several government programmes covering wider economic growth in the country. The Food for Work programme implemented by the World Food Programme is the most extensive one in the hills and mountains. Recently, a Decentralized Rural Infrastructure Development and Livelihood Project was implemented in 18 remote and

conflict-affected districts with the target of constructing 100 km of rural roads and 20 suspension bridges. The budget allocated for this project was Rs. 500 million (US\$ 7.7 million). The Community Livestock Development Programme has been engaged in income generating activities, covering 18,700 farm families of *Dalits* and freed bonded labourers in 22 districts. The Poverty Alleviation Fund has carried out 667 income generating programmes, 379 community infrastructure development programmes and 1,714 creative programmes in 1,200 VDCs of 25 districts in Far and Mid-Western regions to improve the socio-economic situation of the lower-income groups living in absolute poverty. Under this fund, a total of Rs. 1.25 billion (US\$ 19.2 million) was allocated for the fiscal year, 2006/07. This programme successfully targeted poor and ultra-poor groups and has been expanded into additional districts recently.

Some specific policies for wider economic growth adopted by the Interim Plan are as follows:

- Investment and facilities for underground water, irrigation in mountains, micro-irrigation and rain water harvesting will be increased, and co-ordinated agriculture projects will be launched targeting poor, conflict-hit and vulnerable farmers for a fixed period in remote areas of districts, where there are no such facilities.
- Small farmers and businessmen will be encouraged to establish joint venture industries, and small and medium agriculture-based industries.
- Insurance policies will be provided to agriculture and animal husbandry.
- Specific goal-oriented schemes and social mobilization programmes will be introduced to empower women, *dalits*, indigenous nationalities, *Madhesis*, disabled, Muslims, marginalized classes and backward regions. Substantial contributions will be made in the reduction of poverty both in rural and urban areas through programmes to improve social empowerment, infrastructure and income generation.
- Certain development programmes will be launched at the local level to meet local needs through optimum mobilization of local resources, skills and technologies.
- Integrated national co-operative policies and regional policies will be formulated and implemented to develop co-operative systems as a major force for economic, social and cultural development. Co-operative education will be encouraged and expanded to governmental, co-operative and private sectors.

Reducing costs and increasing prices through subsidies

Low productivity and inability to compete cause problems of poverty and food insecurity in Nepal. Yields in major crops are far lower than in other South Asian countries.

This is due to subsistence production systems and inadequate availability of inputs and technologies. Virtually, no agricultural inputs and products are subsidized in Nepal except some subsidies for transportation to and from remote mountain districts. Most of the subsidies, including subsidies on shallow tube-wells and fertilizers were eliminated in 2000 as part of a structural adjustment programme. This policy has been very controversial and many experts argue against it. Under the Groundwater Deep Tube-Well Programme, 50 per cent of the electricity cost was expected to be borne by the Government.

Resource conservation technologies (RCT) have been applied to rice–wheat systems to reduce the cost of cultivation. Results showed that yields of wheat increased by 20 to 30 per cent over the non-RCT. This system conserved moisture, reduced labour costs and controlled weeds better. Conventional transplantation of rice seedlings is being steadily replaced by direct-seeded rice (DSR), enhancing yields by 20 per cent over non-DSR rice with water conservation of 30 to 50 per cent.

Technologies to reduce the cost of milk and meat production (minimum tillage practices in Stylo, relay cropping of Berseem (*Trifolium alexandrinum*), management of terrace risers, hortipasture, rangeland improvement, forage conservation) have resulted in more milk and meat production from various species of livestock. These technologies have reduced milk production costs by 50 per cent, increasing net profit of Rs 1,300 per milking animal per month. Vegetation coverage has increased from 15 to 95 per cent helping restore and protect the environment. Over 10 varieties of forage species have been identified and recommended for fodder development in terai, mid-hill and high hill regions of the country. These technologies have been developed through the participation of farmers from terai, mid-hill and high hill regions.

The Interim Plan does not have any specific subsidy policies for the agriculture sector. On production costs, the Plan clearly states that by using modern and appropriate technologies, agriculture production costs, especially the high-cost agriculture produce, will be lowered and productivity will be increased.

The way forward

- Poverty, deeply rooted in rural areas, is a major challenge for the country.
- Development of rural infrastructure (roads, electricity, communication, marketing channels, etc.) support for rural employment generation.
- Enhancement of a market-led agricultural production system.
- Strengthening rural micro-credit and financing institutions.

- Diversification of production systems and agro processing.
- Strengthening rural-urban linkages to improve rural economy.
- Exploiting niche opportunities.
- Harnessing rural human capital for off-farm activities.
- Essential subsidies for enhancing competitiveness and viability of production systems.
- Strengthening insurance systems for crops and livestock/fisheries.
- Enhancing institutional capacity at both local and national level.

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Country Status Paper – Pakistan*

*Dr. Syed Ghazanfar Abbas***

Introduction

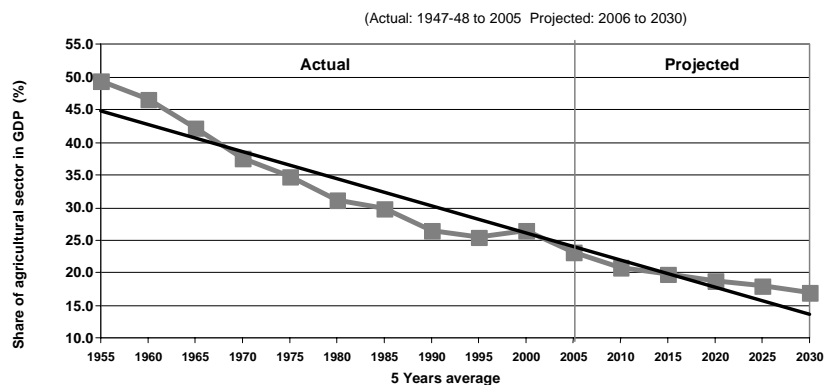
Pakistan is the tenth largest country in the world with a population of approximately 150 million. It lies in South West Asia with the Pamir Plateau to the north and Arabian Sea to the South. The whole of the country lies approximately between latitude 23.5° North and 40° North and longitude 60° East and 80° East. It is classified as a middle-income developing country with 22 per cent of total households living below the absolute poverty line. The vast majority of the population (70 per cent) lives in rural areas and is mainly dependent on agricultural activities for its livelihood.

Agriculture has always been the most important sector of Pakistan's economy. At the time of independence in 1947, the agricultural sector accounted for 52 per cent of GDP. In 1987, this sector accounted for 26 per cent of GDP and 67 per cent of the export earnings. The sector has maintained an annual growth rate of 4.4 per cent. However, like everywhere in the world, the share of the agricultural sector in GDP is declining in Pakistan. The graph below shows that during 2005-2006 agriculture accounted for 23.1 per cent of GDP. Economists have projected further declines as shown in the graph.

* Paper presented at the Regional Meeting on "Towards a Joint Regional Agenda for the Alleviation of Poverty through Agriculture and Secondary Crop Development", Bangkok, 21-22 November 2007.

** Pakistan Agricultural Research Council, Islamabad, Pakistan (<http://www.parc.gov.pk/>).

Figure 1. Share of agricultural sector in GDP



Source: Federal Bureau of Statistics, Projection based on regression analysis of 26 year data (1980-05) by using Chiang method and further extrapolated through compound growth method ($P_n = P_i(1+r)^n$).

Major crops

The major crops and fruits grown are:

- | | | |
|---------------------------|----------------|----------------|
| 1. Wheat | 10. Sugar-beet | 19. Vegetables |
| 2. Rice | 11. Pulses | 20. Citrus |
| 3. Cotton | 12. Ground-nut | 21. Mango |
| 4. Maize | 13. Sunflower | 22. Banana |
| 5. Sugar cane | 14. Onion | 23. Apple |
| 6. <i>Bajra</i> (Millet) | 15. Ginger | 24. Apricot |
| 7. <i>Jawar</i> (Sorghum) | 16. Chillies | 25. Pears |
| 8. Barley | 17. Potato | 26. Dates |
| 9. Tobacco | 18. Tomato | 27. Grapes |

However, due to less economical returns from some major crops (wheat, rice and sugar cane) farmers are now shifting towards growing vegetables and other crops.

Investment in agricultural research – Asia

Investment in agricultural research helps producers through lower production costs, and consumers through reduced prices thereby contributing to growth and poverty reduction. Asia-wide (28 countries) public investment in agricultural research increased by 56 per cent from US\$ 4.8 billion in 1991 to US\$ 7.5 billion in 2000 (Pardey *et al.*, 2005). Of these, two countries alone – China and India – spent 66 per cent of Asia's and the Pacific's total public spending in agriculture research (Table 1). These investments produced high rates of return with a benefit-cost ratio of 2:1 (IFPRI, 2005). Further studies on multiplier effects suggest that an extra dollar in agricultural income typically guarantees an additional US\$ 0.5–1.0 dollar in non-farm income (Delgado *et al.*, 1998)¹.

Some examples of the spectacular impacts of agricultural research in Asia are:

- Cereal production more than doubled exclusively through productivity increases on the same area of cultivated land that was planted in wheat and rice in 1970.
- Food availability increased by 24 per cent despite a 60 per cent increase in Asia's population.
- GDP per capita tripled, driven primarily by growth in urban-industrialization and the rural non-farm sector from 1980 onwards.
- From 1975 the number of poor declined by 28% to 824 million in 1995 (ADB, 2001).

Table 1. Total public agricultural research and development spending by region (1991 & 2000)

Countries	Agricultural R&D spending (M\$)			
	1991	2000	Percentage change	Ratio (2000)
Developing countries (117)	9 459	12 819		
Asia and Pacific (28 countries)	4 847	7 523		
- China	1 733	3 150	82%	21
- India	1 004	1 858	85%	12
- Pakistan	219	152	-31%	01
High-income countries (22 countries)	10 534	10 191		
Total (139 countries)	19 992	23 010		

Source: Pardey *et al.* (2005) based on data from the Agricultural Science & Technology Initiative (ASTI)

¹ Studies on the links between agricultural growth and the rural non-farm economy in Asia have estimated regional income multipliers between 1.5 and 2.0 i.e. for each dollar increase in agriculture value-added, there is an additional \$0.5 to \$1.0 increase in the non-farm sector.

Investment in agricultural research – Pakistan

Agriculture research spending in Pakistan over the past decade reveals a consistently declining trend since the 1990s. A recent study by the Agriculture Science and Technology Initiative (ASTI) of USA (ASTI, 2004) indicated that between 1990 and 2000, agriculture research spending in Pakistan declined by 31 per cent, while it increased by 85 per cent in India and 82 per cent in China. Another study by IFPRI in 2005 indicated that total spending in agricultural research as a percentage of agricultural GDP in Pakistan was 0.31 per cent. This is the lowest spending level in South and East Asia except for Nepal (Table 2). In addition, the research management system is grossly under funded, overly bureaucratized, rigid and inefficient. It was therefore a matter of utmost urgency to restructure the national agricultural research system in Pakistan to address the emerging challenges of improving agricultural productivity, profitability and food security on a sustainable basis. The current Government in Pakistan realized this and a comprehensive restructuring of PARC was approved by the Prime Minister of Pakistan and this restructuring is currently being implemented. Besides providing a massive budget increase for agricultural research, the pay structure of agricultural scientists has also been revised to avoid any further brain drain.

Table 2. Agricultural research expenditure and agricultural percentage of GDP

Country	Expenditure per scientist (\$000)*	% of Agricultural GDP
Pakistan	54	0.31
Nepal	61	0.22
Philippines	66	0.44
Bangladesh	98	0.36
Sri Lanka	101	0.49
Malaysia	345	1.92

*International dollars (PPP basis).

The role of agriculture in poverty reduction

Agriculture plays an important role in the country's development. According to a recent FAO publication some active roles that the agricultural sector performs throughout the development path are: i) agriculture provides food necessary for a growing economy; ii) agricultural exports generate the foreign exchange necessary to import capital goods; iii) this sector is capable of generating savings; and iv) a growing agricultural sector creates a larger local market for non-agricultural sectors.

Unemployment is directly linked with poverty. Like in many other developing countries, the employment situation in Pakistan has also worsened in recent years. The Government realizes that the promotion of the rural economy in a sustainable way has the potential of increasing employment opportunities, reducing regional income disparities, stemming premature rural-urban migration and ultimately reducing poverty. A major example of such sustainable development could be quoted as the promotion of backward industries consisting of a large number of small firms (fertilizer mixing, small-scale transport, agricultural implement manufacturers and repairs workshops) largely labour intensive and vital for rural economies.

Current research priorities for agriculture poverty reduction

Pakistan planners and policymakers recognized the significance of agriculture as far back as the early 1960s. Encouraged by the achievement of food self-sufficiency in wheat and rice through the Green Revolution of the 1960s, the agricultural policymakers in Pakistan implemented a public policy with a dual function: firstly, removing bottlenecks that caused wastage of resources and improving productivity not only per unit of land but also per worker. Secondly, reaching target groups especially in rural Pakistan.

Today the most promising strategy for raising agricultural crop incomes remains in diversification into higher value crops. Pakistan is also well positioned to compete in expanding export markets for citrus, dates and other fruits, particularly to the Middle East. Faster growth in non-traditional agricultural exports (fruits and vegetables, meat, fish) requires improved national capacity to meet sanitary and phytosanitary standards (SPS) imposed in the WTO regime.

The livestock sub-sector (cattle, dairy, sheep, goats and poultry), which is dominated by smallholders, accounts for half of agricultural GDP (11 per cent of total GDP), and is fastest growing component of the agricultural sector. Milk production is expanding but most of the milk continues to be marketed through traditional channels. There is a need to educate farmers to sell the byproducts for increased profits. Significant productivity gains are feasible through use of improved feeds, better veterinary services and more efficient marketing channels to ensure higher prices for farmers. In the susceptible poultry sector, Pakistan needs to be well prepared to contain outbreaks of poultry diseases, such as avian flu, through the timely flow of information regarding such outbreaks.

To conclude this section, PARC has prepared a new strategy to enhance its capabilities to help farmers benefit from agricultural research. This includes:

- diversification into high-value agriculture
- value addition and market connectivity
- application of biotechnology for genetic improvement of crops, livestock and fisheries
- integrated farming systems approach for smallholders
- participatory research, knowledge management and utilization
- linking farmers with markets
- biosafety and biosecurity
- strong agricultural research and extension linkages
- development of resource conservation technologies
- enhanced partnership with national and international stakeholder.

Agricultural credit

Total formal-sector rural credit has expanded rapidly since the Zari Taraqati Bank Limited (ZBTL) reformed its policies in the late 1990s to simplify lending procedures and make credit more accessible to small landowners. As a result total rural credit grew by an average annual rate of 12 per cent in real terms between 1999-2000 and 2005-2006. Commercial credit more than quadrupled in real terms over the same period, increasing its share of total formal credit from an average of only 23 per cent in 1990s to over half of all credit in 2005-2006. According to data nearly 80 per cent of cultivator households participate in the credit market, with two thirds of total rural credit coming from the informal sector.

Because of uncertainties about land titles in the prevailing land-record system banks are usually reluctant to lend money on the basis of these titles. Thus, improvements in land administration and land titling could improve access to credit, as well as facilitate more efficient use of land, as well as increase security of tenure. Crop insurance measures and a policy to link loans with insurance policies can also generate Commercial Banks' interest in granting loans to farmers.

Alternative secondary crops for increased farmers' income

Due to ever increasing oil prices in the international market (over 80 US\$ per barrel) alternative fuels are getting due priority in Pakistan as well. The Government has established an Alternative Energy Development Board (AEDB) right in the Prime Minister's Secretariat in Islamabad. It has identified the following crops for producing 'biodiesel':

Jatropha (*Jatropha curcas*)

- Suitable for drier land – widely grown in Asia
- Stable and economic price – oil price is stable and low compared to other sources
- Attractive yield time – only 1 to 2 years are needed for the first yield and it lasts 50 years for the harvest, yields 2.5 to 5 mt/ha oil content 25-30%
- Environment friendly, Jatropha BDF is suitable for the Clean Development Mechanism
- Reported area under cultivation 1.5 million ha, projected 10.0 million ha by 2010

Caster bean (*Ricinus communis*)

- Suitable for arid zone climate and rainfed conditions
- Average yield ranges 1.0 to 3.0 mt/ha
- Oil contents range from 40 to 50 per cent depending on the variety
- Suitable for biodiesel production
- Cake used as organic manure
- Pulp used for cardboard and newspaper industry

Salicornia (*Salicornia bigelovii*)

- Leafless annual plant with green, jointed, succulent stems suitable for salt-affected soils
- Grown in the arid, semi-arid sub-tropics (India, Pakistan, Saudi Arabia, UAE, Egypt and Mexico)
- Achieves a biomass of about 15 to 25 tons/ha
- 30 per cent oil content

Sukh Chayn (*Pongamia pinnata*)

- Similar to Jatropha, suitable for drier land – widely grown throughout Asia
- Stable and economical price – oil price is stable and low compared to other sources
- 2–3 years are needed for the first yield and it lasts up to 50 years for the harvest, yields 1.5 to 3 mt/ha; oil content 25 to 30 per cent
- Eco-friendly Sukh Chayn is suitable for the Clean Development Mechanism.

It is significant to point out that the non-edible vegetable oils of jatropha and castor bean have potential for providing commercially viable alternatives to diesel oil. However, more research and economic feasibility studies, as well as support from the Government, is needed to popularize these crops.

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Poverty Alleviation Programmes in the Philippine Agricultural Sector*

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Introduction

Agriculture in the Philippines, including the fisheries sector, is an important segment of the Philippine economy. It contributes 14 per cent to the gross domestic product and employs directly and indirectly 11.6 million workers or 37 per cent of the total labour force. Over two thirds of the poor depend directly and indirectly on agriculture for their livelihood and sustenance. In spite of the limited area for agricultural cultivation, which stands at 9.97 million hectares, agriculture for the last three years has been posting respectable growth of 3.4 per cent annually. These rates of growth, however, are hardly sustainable, which implies that the sector should be modernized and transformed into a technology-based industry.

The average farm household earns PhP 57,628 annually or US\$ 3.75 dollars a day. This amount can hardly support a family of five to six members, which is the average size of Philippine farm households. The country's success or failure in winning the war against poverty will depend on how household incomes can be increased. Given the rapid population growth (2.36 per cent annually) and the closure of the land frontier, increases in income can originate only from productivity growth. This remains a critical challenge, given the productivity slow-down in agriculture in recent decades. But it is heartening to note that national productivity increases had been shown in rice and tilapia production through increased adoption of attendant technologies.

Along with the primary objectives of the Department of Agriculture (DA) of ensuring food security, increasing productivity and incomes of farmers and fisher-folk, protecting the agricultural resource base, and attaining global competitiveness, poverty alleviation and people empowerment in the sector is given close attention, especially in marginal areas. To

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address this concern, the DA has implemented national programmes focusing on small farmers and fisher-folk.

The Department of Agriculture's Poverty Alleviation Programme

Goal I and Goal II under the Medium-term Philippine Development Plan (MTPDP)

This development programme is not solely for impoverished farmers and fisher-folk, but also for progressive farmers who intend to enter into agribusiness ventures. Goal I aims to develop 2 million hectares of idle/vacant lands for agribusiness development to create 2 million jobs by 2010. As of 2006, a total of 300,510 ha had been developed, generating 532,646 jobs. The biggest area of 45,000 ha in Region XII was planted with coconut, corn and high-value crops (banana, cassava and vegetables). In Region IV-A alone, 86,917 agriculture-related jobs were generated. Furthermore, 145,440 jobs were created with a PhP 3.92 billion loan and guarantees for agriculture-related ventures.

Goal II involves the reduction of costs through productivity enhancement, efficient logistics and improved retailing linkages.

DA's Productivity and Income-Enhancement Programmes for Marginal Areas

These programmes include, aside from improvements in crop varieties and cultural practices, support productivity enhancement from production to post-production stage. These programmes are collaborative projects involving DA agencies and its regional field units, local government units and the private sector. These programmes are tailor-made to meet the needs of small farmers and fisher-folk taking into account the beneficiaries' limitations with financial constraints in the purchase of production inputs and the suitability of the site-specific environment and natural resources in the cultivation of certain crops or animal production.

Irrigation

The rehabilitation and restoration of existing national and communal systems is one of the Department's top priorities for the current year 2007. This programme intends to promote cost-effective crop growing, and support the rice self-sufficiency goal of the government, at the same time generating jobs in the sector. To make irrigation available to small farmers, focus will be given to small-scale irrigation systems as they are short-gestating, easier and cheaper to install and adaptable to crop diversification.

Small Water Impounding Projects (SWIPs)

SWIP is not a new technology but it is being institutionalized as a means of providing water or the needed moisture to crops when needed all year round. It is a structure constructed across a narrow depression or valley to hold back water and develop a reservoir that stores rainfall and run-off during the rainy season for immediate or future use. This project has long been implemented by the DA through its Bureau of Soils and Water Management (BSWM) in collaboration with the DA regional field units. This is also implemented in partnership with local government units which have the capacity to implement these types of projects.

A structure with a height of 5-15 metres, SWIP has a storage capacity of about 0.3 million cubic metres and could service an area of 25–150 ha. It requires a modest investment cost per hectare of service area, at PhP 60,000–125,000 (US\$ 1,392–2,894). It is recommended as one of the mechanical measures to promote the effective use and conservation of soil in upland areas. It can transform poor upland rural communities into more self-reliant and viable communities while harmonizing natural resources management and infrastructure development. It enhances the environmental services of agriculture in terms of flood mitigation, fostering ground water recharge and sediment capture.

SWIP is recognized as one of the major interventions to mitigate the impact of extreme climatic events, i.e. during El Nino (by ensuring the availability of conserved rainwater) and during La Nina (by capturing run-off to help prevent flooding). Aside from irrigation, SWIP can provide water for various uses, such as:

- domestic purposes, and livestock production in critical, less-accessible upland areas;
- for flood prevention and control in high rainfall areas;
- for recharging ground water and spring sources for domestic and other uses;
- for value-adding activities and environmental impacts such as recreation and development of habitat for wildlife and biodiversity.

Project benefits

Farm level

- Increases cropping intensity and yield.
- Facilitates growing of crops other than rice (i.e. crop diversification).
- Augments farm income through integration of fish and livestock production.

Community level

- Provides additional sources of income for water users and local people.
- Increases labour demand within the rural community.

Organic-based agricultural development (*Agri-Kalikassan*)

Agri-Kalikassan is the primary DA strategic cost-reduction, environmentally friendly food production measure to reduce the dependence of vulnerable small farms on chemical-based fertilizer. It is a science-based back-to-basics sustainable agriculture and rural development programme that advocates the implementation of organic-based farming guided by scientific principles. The programme implements two technologies, a) modified rapid composting (MRC) which promotes farm wastes for farmers having limited capital to sustain production; and b) *tipid abono* (TA) which is an alternative technology to help farmers cope with high input costs.

The general objective of the programme is to intensify the gains of the GMA (or Bountiful Golden Harvest) Rice programme of the DA for food security through the establishment of commercial production farms and to promote a more practical and prudent use of chemical fertilizer through the utilization of microbial inoculants as biofertilizer.

The specific objectives are to:

- provide fertilizer subsidy in the form of microbial inoculants to the farmers;
- distribute soil test kits (STK) and rapid soil test kits (RST) to technicians and farmer leaders;
- strengthen awareness in the use of proper waste management through education and training;
- encourage LGU participation to protect the country's soil and water resources;
- establish organic and microbial fertilizer production plant in selected areas;
- reduce chemical fertilizer usage by 50 per cent and increase production by 25 per cent using microbial inoculants;
- commercially establish 50 hectares MRC production farms;
- create partnerships with commercial organic producers;
- conduct fertility mapping.

Project components include:

- procurement and distribution of microbial inoculants;
- production and distribution of fertilizer guide maps;
- extension support, education and training;

- research and development;
- information and support system services;
- policy formulation, planning and advisory services.

The Community-based Participatory Action Research Programme

The Community-based Participatory Action Research Programme (CPAR) is the banner programme of the DA's Bureau of Agricultural Research (BAR). This is being implemented to accelerate the adoption of technologies by farmers and fisher-folk. Piloted in three regions in 1999 and later expanded to all the 16 regions of the country, the CPAR projects are implemented by the respective DA Regional Integrated Agricultural Research Centers (RIARCs) and the DA Regional Fisheries Research and Development Centers (RIFRDCs). CPAR projects are conducted in collaboration with various institutions, including; selected state universities and colleges (SUCs), DA's Agricultural Training Institute (ATI), local government units (LGUs), farmers' organizations, and people's organizations.

The CPAR approach promotes more active client participation in research project identification, planning, implementation and evaluation. It involves the application of technologies at farmers' fields, collectively managed by farmers to compare packages of new technologies with farmers' practices following the farming systems approach. This is done in consideration of the poor farmers' and fisher-folk's financial limitations in the purchase of farm inputs and indigenous knowledge which are modified to increase total farm productivity and income within the context of sustainable production system. Aside from verifying the feasibility and economic viability of technologies in site-specific areas, the CPAR programme aims to improve the allocation of resources for the efficient utilization and management of the farm environment to enable the farm family to increase productivity and income. Affordable, cost-effective and site-specific production-enhancing technologies are developed right on farmers' fields to accelerate technology dissemination. This leads to the efficient distribution of the benefits of stakeholders in agriculture and fisheries. It is in cognizance of this that BAR initiated this programme.

Delivery of Goods and Services through Pro-Poor Programme

Rice Distribution by the National Food Authority

The National Food Authority (NFA) procures rice, corn and sugar from the producers with the aim of maintaining a buffer stock and stabilizing the prices of these commodities at affordable levels. In 2006, about 1.31 million metric tons of rice were distributed nationwide

through NFA's various market outlets and maintained consumer price for well-milled rice at PhP 23.56/kg. About 64,000 metric tons of palay were procured by NFA from farmers, equivalent to 48 per cent of the targeted 143,192 metric tons to be procured. Even at this level of procurement, NFA's presence was already able to influence the ex-farm price which averaged PhP 10.81 compared to the NFA's buying price of PhP 10.00.

Coconut Farmers Safety Net Programme (CFSNP)

The Department, through the Philippine Coconut Authority implements the following projects for the benefit of coconut farmers and farm workers in the countryside.

Direct Copra Marketing Assistance Project

This is a component of the CFSNP, implemented with the objective of increasing the incomes of farmers by providing assistance in bringing their coconut directly to the oil mill to shorten the operations involved, reduce trading costs and provide other sources of income from other produce planted/raised within the coconut farm. The project has two components, a) nut/copra trading support and b) working capital for nut/copra buying. The Coconut Farmers and Farm Workers Organizations (CFFO) are provided with working capital for the purchase of whole coconuts to be delivered to the Coconut Industry Investment Fund (CIIF) oil mill or copra buying units (CBUs). The CIIF then processes the nuts, i.e. de-husks, produces copra, produces fertilizer from the peat, and markets the coir. In 2006, 140 CBUs were established and a total 25,808 farmer-members are now benefiting from the scheme.

Microfinance and Credit

This programme aims to provide working capital for livelihood projects and enhance entrepreneurial skills of coconut farmers and farm workers. In 2006, a total of 631 farmers' co-operatives were established with 17,563 members granted loan assistance amounting to PhP 116.38 million (US\$ 2.7 million).

Farmers' Empowerment Programme

The NFA- owned Post-Harvest Facilities (PHFs) Assistance Programme

This programme intends to help Farmers' Organizations (FOs) acquire post-harvest facilities of their preferred brand at reasonable prices and reasonable payment terms. The provision of post-harvest facilities is envisioned to reduce grain losses, lessen post-harvest operations costs and shorten the time period of various post-production operations. A total of 1,918 farmers and 4,642 institutions have participated in the programme at minimal rates.

Cooperative Development Incentive Fee (CDIF) and Post Production Incentive for Services Offered (PPISO)

CDIF, a monetary incentive to FOs, is used as a revolving fund for the acquisition or rental of post-harvest facilities by giving farmer-members incentives of PhP 0.25/kg (6 cents) for *palay* they sell to NFA. The usage of CDIF was initially limited to the purchase of post-harvest equipment, since many FOs have accumulated CDIF amounting to millions of pesos. NFA opened other uses for the fund such as entrepreneurial and development programmes and the purchase of farm inputs. For 2006, CDIF released PhP 18.24 million (US\$ 423,202), benefiting 257 FOs.

Young Farmers Programme-NFA Component (YFP-NFA)

This programme involved the utilization of NFA's vacant/available lots by interested young farmers in the agricultural sector through proper and sustainable agribusiness activities. This is implemented in co-ordination with the National Agricultural and Fishery Council (NAFC) and Congressional Oversight Committee for Agriculture and Fisheries Modernization (COCAFAM). Under the programme, the government is committed to help participating entrepreneurs to secure loans representing 60 per cent of the total capital needed for their proposed agribusiness project. The 25 per cent of their needed capital would be provided as grant by the programme, while the remaining 15 per cent has to be raised by the proponent as equity. For the past year, 26 project proposals on agriculture and fisheries (e.g. banana and livestock) were granted funding from the programme amounting to PhP 1.81 million (US\$ 41,995).

Institutionalized Farmers as Distributors (I-FAD) Programmes

The government, through NFA/Philippine Investment Trading Corporation (PITC) sells stocks to qualified farmers groups based on the approved NFA selling Price Bulletin (SPB) for distribution to buyers. Farmers can participate in the programme and can purchase NFA imported rice at wholesale prices, withdraw within a specific period and sell wherever they want. For 2006, the programme had a total approved rice allocation of 50,000 mt, withdrawing 67 per cent of the total rice allocation.

Programang Gulayan (Vegetable Production Programme)

The *Programang Gulayan Tungo sa Kanayunang Malusog at Busog sa Pag-asa* (Vegetable Production Programme toward Healthy Community and Full of Hope) aims to reduce rural hunger and malnutrition, enhance the rural community to produce their own

food through adoption of integrated backyard gardening. Of the 170 *barangays* (communities) in the four pilot regions, 84 were served, benefiting 13,669 families.

Special Lending Programme for Tobacco Farmers

The QUEDANCOR, in partnership with the Department's Agricultural Credit Policy Council and the National Tobacco Administration, created a special lending programme for tobacco farmers to initially finance the production of Virginia and Burley-neutral tobacco in selected provinces of Region I (in Northern Luzon). For the period ending 2006, a total of PhP 28.13 million (US\$ 652,668) was released to 1,382 beneficiaries in Ilocos and Pangasinan. The Innovative Financing Scheme Programme (IFSP) was extended for another five years. This extension was due to the impressive achievements in its five years of implementation. The programme addresses the needs of borrowers who could not meet the collateral and other requirements of the commercial lenders that hindered flow of credit to the countryside.

The National Tobacco Administration also managed and operated the Productivity and Growth through Marketing Assistance – Multi-Food Processing Plant (PGMA-MFPP) in Santa, Ilocos Sur. The MRPP assists tobacco farmers during off-season by buying, processing and distributing their non-tobacco products (hogs, poultry, fruits, vegetables, etc.) with pre-arranged markets in Regions I, II and Metro Manila. Around 35,000 tobacco farmers were assisted by this initiative.

Conclusion

It is an established fact that the basic requirement to alleviate poverty in the sector is to propel the growth of the agricultural economy. Aside from the various programmes presented above, other priority projects are being continued or implemented within the next five years. The Department adopts a holistic development approach, which is embodied in the DA's Five Development Pillars for Agriculture and Fisheries. These are: 1) irrigation facility; 2) post-harvest and storage; 3) market access; 4) R&D, education and extension; and 5) credit facilitation. The current focus now is on the entire agriculture and fisheries supply chain, from production to market. These development pillars, which embody various programmes, are being implemented in collaboration with state universities and colleges, local government units and the private sector. This model promotes awareness of development projects among stakeholders, beneficiaries, farmers and fisher-folk. Further, it promotes synergy through concerted efforts in achieving the goals, objectives and future vision for the sector.

Targeting Poverty Alleviation through Agriculture in Papua New Guinea

*Jesse Anjen and Raghunath Ghodake**

Agriculture and poverty in Papua New Guinea

Eighty-six per cent of Papua New Guinea's (PNG) total population of 6.3 million (estimates for 2007) depends directly on agriculture. The agricultural sector is and continues to be the main source of socio-economic development in the country. Most people live in rural areas and about 95 per cent of them are smallholder farmers ranging from subsistence to semi-commercial to fully commercial operators. Smallholder agriculture provides the bulk of the nation's fresh food and is a major source of income and employment for rural communities.

Over the past 15 years the socio-economic situation in PNG has been on the decline with a noticeable and significant downward trend in real GDP between 1990 and 2002. Real GDP grew at an average annual rate of only 1.0 per cent. However, PNG is experiencing rapid population growth of about 3 per cent per year. In recent years the economic climate in PNG has been improving with real GDP growth rising to 3.7 per cent in 2006. This is following three consecutive years of moderate expansion of 2.2, 2.9 and 3.3 per cent during 2003, 2004 and 2005, respectively. Growth of 4.5 per cent is projected for 2007 and this trend is likely to continue for some years. The non-mineral sector is expected to continue to grow by about 4 per cent. This growth has been driven by the mineral resource sector, accompanied by improved economic management, improved budgetary performance and lower interest rates. The agricultural sector has also been expanding. At the same time, poverty remains high, human development indicators are weak, the quality of education and health care delivery remains poor. Incidence of HIV/AIDS has increased sharply. Like many other countries, both relative and absolute poverty is present in PNG both in the rural and urban areas.

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The agricultural sector has huge untapped potential to assure food security, generate cash income, increase gainful employment, reduce poverty and contribute to rural development to help realize broad-based economic growth and development. In the longer term, the sector has the potential to empower people and create wealth, providing greater prosperity to the whole nation. Agricultural research and innovative developments are critical contributions to the development of the sector, especially given the current magnitude of the constraints and problems in this high-potential but largely untapped sector.

To reduce poverty, PNG needs to sustain recent economic gains while moving the economy to a higher and wider growth path. Achieving this goal is largely dependent on increasing investment in the non-mineral sector. The growth generated from the mining and petroleum enclaves is not sufficient to achieve broad-based economic growth and it is crucial that growth must come from the renewable resource sector, the important smallholder agriculture sector. This can only be realized through creating an enabling environment through policy changes, technical innovations and encompassing a broad spectrum of economic reforms.

However, so far adjustments at the macro level have not shown any measurable positive impacts for the majority of the people, especially the rural communities. Furthermore, production and income levels from subsistence and semi-commercial agriculture have been declining because of problems associated with poor infrastructure, law and order, health, access to markets and inadequate knowledge of improved technologies.

Overall development context

As a member of the United Nations, PNG is committed to the achievement of the Millennium Development Goals as declared at the UN Millennium Summit in September 2000. Five of the Goals directly targeting poverty reduction and improving livelihoods, that can be realized through agriculture and rural development in PNG are:

- Eradication of extreme poverty and hunger;
- Reduction in child mortality;
- Promoting gender equality and empowering women;
- Combating HIV/AIDS, malaria and other diseases;
- Ensuring environmental sustainability.

The PNG Government's Medium Term Development Strategy: 2005-2010 (MTDS) provides a focused framework for economic recovery and social advancement. The focus is

on broad-based economic growth made possible by empowering Papua New Guineans to realize income-generating opportunities through export growth by means of private sector development. Agriculture plays a prime role in these key strategies for empowering people toward an export-led economic recovery. Agriculture provides opportunities for poverty reduction and rural development especially through assuring food security, raising cash incomes, generating gainful employment and creating sustainable growth and development.

The National Strategies include a number of proposed policy and strategy interventions to address major constraints, opportunities and issues of the agriculture sector.

Agricultural issues and opportunities

Agriculture in PNG faces a number of specific issues (Quartermain *et al.*, 2003) as highlighted below:

- The sector is resource rich but does not generate production income anywhere near its potential.
- Cash incomes generated from agricultural activities are low, variable over time and extremely diverse across provinces and agro-ecological regions.
- Low and uncertain levels of employment in the sector are characterized by low productivity, underemployment and low wages.
- Customary land ownership and tenure are constraining investment in agriculture.
- Increasing degradation of the environment and depletion of natural resources are indicated by declining soil fertility, increasing population pressure, soil erosion and land degradation.
- There is weak growth in the export of agricultural commodities and a rising food imports bill.
- Market signals are weak and services, including input supplies, downstream processing and output marketing, are poorly developed.
- Agricultural infrastructure (roads, ports, markets, facilities, information and input supply, etc.) is poorly developed and maintained.
- The sector has weak institutional capacity, particularly in agricultural extension, and a lack of clear policies and strategies for agriculture and rural development.
- There is inadequate access to improved agricultural technologies and practices.

Agricultural research and development and poverty alleviation

The agricultural sector has huge untapped potential to assure food security, increase incomes, improve gainful employment, reduce poverty and contribute to rural development to help realize broad-based balanced economic growth and development. In the medium to long term, the sector provides the opportunity to empower people and create wealth to bring greater prosperity to the whole nation.

Many opportunities arise from PNG's rich natural resources base and the potential to achieve substantial productivity gains through science-based agricultural technology and transfer of knowledge to rural communities, thereby making communities food secure, income secure and future secure. Specific opportunities are explored through following research and development project/programme interventions.

FAO South-South Co-operation (Special Programme for Food Security)

Under the United Nations Food and Agriculture Organization (FAO), South-South Co-operation (SSC), its Special Programme for Food Security (SPFS) provides an opportunity to strengthen co-operation among developing countries at different stages of development with the support of interested donor countries and FAO. The initiative helps countries benefit from the experience and expertise of more developed countries as well as to exchange successful technologies. Under the agreement, Filipino agricultural experts and field technicians are in Papua New Guinea to assist the government with expansion of the SPFS for two years. The Filipino experts and field technicians are providing assistance related to field and horticulture crop production; soil fertility and micronutrient management; crop water-use requirements and in the design, implementation and management of small-scale irrigation systems. The team includes water use and management specialists, field crop specialists, horticulture crop specialists, and soil fertility management specialists, as well as laboratory analysis specialists.

The agencies involved are: FAO, Philippines Government, National Department of Agriculture, participating education institutions and farmers

Development of Sustainable Agriculture in the Pacific (DSAP)

The Development of Sustainable Agriculture in the Pacific promotes and implements sustainable agriculture that will improve food production thereby enhancing food security and income generation in the Pacific. On the atolls, the DSAP approach focuses on the identification of problems and the testing of technologies with farmers to improve the traditional tree crop-based multi-story agricultural systems as well as to ensure the

integration of livestock into this system. In the lowlands, the emphasis moved from research to identification and promotion of promising technologies including: improved crop varieties, pest and disease management, land conservation and agro-forestry technologies. DSAP also includes a project component for the production and use of a variety of extension communication to strengthen promotions within member countries. This component also enhances national capabilities in the production and use of extension communications methods such as radio, posters, handbooks, brochures and videos. The DSAP project is an important part of the Secretariat of Pacific Communities (SPC) Agriculture and Forestry Programme giving DSAP access to valuable technical assistance and training.

The PNG component of DSAP is based on two sub-components, institutional agriculture with emphasis on rice and small livestock production, and marketing and promotion of a sustainable taro industry in PNG with emphasis on taro production and marketing. This project complements PNG's Food Security Policy and Programmes with the goal to ensure that "all people of PNG at all times have access to safe and nutritious food in adequate quality and quantity to maintain a healthy and active life".

The agencies involved are: SPC, NDAL, NARI, participating education institutions and farmers.

Rice, Wheat and Grain Programme

The main aim of this programme is to establish a sustainable domestic industry to enhance food security, generate income for smallholders and reduce rice and wheat imports by increasing domestic production. There is a high demand for wheat flour in PNG and its consumption is increasing at a faster rate than rice. Wheat and rice imports are worth millions of kina annually. Rice research in the country is geared to evaluate promising varieties under upland conditions for high yield, pest and disease tolerance, and good eating qualities, etc., as well as rice variety adaptability screening in various agro-systems. Other activities include germplasm maintenance and foundation seed production and distribution.

The agencies and countries involved are: Taiwan Province of China, China, JICA, Trukai, OISCA, UOT, DNPM, NARI, provincial administrations, University of Vudal, DNPM, DoE, CIS, the private sector and NGOs.

Fruits and Nuts Development Programme

Good domestic and international market potential exists for both exotic and indigenous fruits and nuts. Various projects are evaluating the potential of indigenous nuts

like *galip* nut (*Canarium Indicum*), *taun* (*Piñata pometia*) and others. Key activities include evaluating the nutritional qualities of fruits and kernels, determining the attitudes and perceptions of smallholder producers to the use of these products for improved health and nutrition and assessing the opportunities to increase domestic consumption through genetic selection, market chain efficiencies, value adding and other requirements associated with expanding the food and other industries.

The agencies involved are: NARI, NDAL, FPDA, PDAL, NGO, Unitech, UoV, NAQIA, IPA, the Department of Health, ICCC, NSIT, WIADU and Food Sanitation Council.

Spice and Minor Crops Development Programme

The spice industry has the potential of generating millions of kina in export earnings. The vanilla boom in 2002-2003, encouraged vanilla production nationwide with an estimated 11,000 households involved in vanilla production. The main aim of this programme is to promote and develop spice and minor crops as alternative export cash crop commodities for improving the welfare of rural families and to contribute to the national economy. Current activities are focused on vanilla, turmeric, pepper, cardamom, chilli, nutmeg and mace, etc., and include identification of suitable growing areas, adaptation of commercial clonal propagation techniques, quality assessment, pest control, market research and provision of training and information to extension providers, partners and farmers.

The agencies involved are: NDAL, PDAL, DNPM, Department of Commerce and Trade, Spice Industries Council, NAQIA, NARI, NGOs/CBOs, the private sector and industry participants and international donors.

Livestock and aquaculture development

The main focus of research in the short to medium terms is on the utilization of local feed and by-products for small livestock (pigs, chickens, ducks, rabbits, sheep and goats) and the collection of baseline information on livestock kept by smallholder farmers. Recently, the programme started work on Inland Aquaculture and is setting up essential facilities for research on feed, feeding systems and breeding. Expansion of smallholder livestock production has the potential to impact on the diets and incomes of rural and peri-urban households.

The agencies involved are: NARI, LDC, NDAL, provincial DAL, district/ LLGs, NARI, University of Technology, University of Goroka, Vudal University, NFA, DCI, NAQIA, NGO's, farmer organizations, CBOs, donors, RDB and commercial banks, private sector partners (Trukai Industries, Markham Farm, Ramu Beef) and some line agencies.

Crop Improvement Programme

This programme is aimed at improving and utilizing genetic production potential of crops by using conventional breeding and advanced methods of crop improvement (biotechnology) with a view to addressing food security, improving livelihoods and eventually leading towards overall prosperity. The Programme covers evaluation, introductions, selection and genetic improvement (breeding) of crops not only to increase productivity and quality per unit of resources but also to address pest and diseases, nutritional improvement, processing requirements, product diversification, tolerance to droughts and frosts, and appropriateness to atoll environments.

The agencies involved are: NARI, CCI, CIC, OPRA (Dami) and Ramu Sugar.

Natural resource management

The major research focus of natural resource management (NRM) is on soil fertility management, water, weather and climatic issues; frost management; integrated pest management; rice, grain and pulses intercropping; plant genetic resources (sweet potato, banana, cassava), and disaster mitigation.

The agencies involved are: NARI, Ramu Sugar, Trukai, UoV, CCI, CRI, UOT and the National Weather Service.

Post harvest and food processing

This programme is geared towards developing techniques, technologies, skills and information in post-harvest handling, storage, preservation and processing of food, emerging food and cash crops, and livestock. It is currently implementing research projects, conducting training and providing information and technical support to farmers, commercial entrepreneurs and other stakeholders in the agricultural sector to improve the quality of produce and products, to reduce drudgery and bulkiness, to commercialize processing options, increase the use of domestic resources as well as reduce transport and handling costs.

The agencies involved are: NARI, FPDA, Unitech and Nestle Pty. Ltd.

Plant genetic resources

Plant genetic resources (PGR) are crucial to the present and future productivity of agriculture. PGR activities are helping to improve the management of these valuable resources and ensure the rich genetic biodiversity of PNG is safely conserved and used sustainably by present and future generations. Current activities include organizing public

awareness discussions on the importance of conserving genetic diversity on farms for food security, conducting on-farm conservation surveys to measure genetic erosion, and introducing improved genetic materials on-farm to broaden the genetic base. These activities are all geared towards broadening the knowledge to conserve, maintain and use on-farm genetic diversity to enhance livelihood of farming communities. They are also complementing these efforts with the long-term maintenance of national *ex situ* germplasm collections in the field of tissue culture, including taro, cassava, yam, sweet potato and banana.

The agencies involved are: NARI and NARS.

Table 1. Regional and national research and development programmes and projects geared towards poverty eradication in PNG

Programmes / Projects	Transferring cash	Increase productivity & income	Wider process of economic growth	Reduce costs & increase prices through subsidies
FAO South-South Co-operation (Special Programme for Food Security)		√	√	
Development of Sustainable Agriculture in the Pacific		√	√	
Rice, Wheat & Grain Programme		√	√	
Fruits and Nuts Development Programme		√	√	
Spice and Minor Crops Development Programme		√	√	
Livestock and Aquaculture Development		√	√	
Crop Improvement Programme		√	√	
Natural Resource Management		√	√	
Post Harvest and Food Processing		√	√	
Plant Genetic Resources		√		

The above programmes are aimed at reducing poverty especially in the rural areas through improving and enhancing agricultural productivity through technical changes and innovative development. Most of these also contribute to poverty reduction through wider economic growth, as these programmes/projects create broad-based economic growth by empowering people and by investing benefits from macro level economic growth.

Concluding commentary

Economic growth at the national level brings spin-off and trickle down benefits to the masses. However, if these benefits are not properly invested in long-term productive economic activities for the masses, they will only amount to the masses getting into an unsustainable expenditure trap.

There does not appear to be any long-term impact on poverty reduction from simple transfer of cash to the masses. In special situations where people are affected by natural disasters and immediate humanitarian relief is needed, an injection of cash is beneficial in the short term. However, such short-term survival measures do not have any long-term contribution to poverty reduction.

However, there appears to be some positive role for subsidies, especially in developing countries, where market forces are not competitive. Also often economic scales and market imperfections influence negatively on productivity and benefit sharing. Under such conditions, subsidies supporting cost reductions and improving prices can become important interventions for the masses to improve efficiency, competitiveness and sustainability in the longer term. Such interventions need to be gradually phased out with more competitive and sustainable interventions through policy and technical changes.

Improved technologies and innovations supported by appropriate policy regimes can make a substantive positive contribution to poverty reduction. Such interventions, however, need to be ongoing and dynamic to sustain poverty reduction.

Therefore a multi-pronged strategy involving good macro-economic growth; efficient and effective technologies and innovations; sound and appropriate policies; broad-based economic growth with wider participation of population at all levels and in all areas; and gainful employment of people and resources are essential to realize the poverty reduction objective of any nation. Obviously, this strategy needs to be tuned to domestic and international scenarios and developments.

Conclusion

Present PNG development is characterized by the recent consistent economic growth at the macro level, the majority of people engaged in the agriculture and rural sector, huge untapped potential of agricultural development through technical and policy changes, and overall potential of both national and international markets. The country now has the capacity to address poverty reduction through all the above four types of intervention. The current development strategy is more focused on improving the productivity and profitability

of the agricultural and rural sector. It also targets improvement in infrastructure, education, health and other social services, thus contributing to wider economic growth. Selective interventions through subsidies may be needed at least over the short to medium terms. However, cash transfers need to be avoided except for humanitarian reasons in the case of natural disasters.

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Poverty and Agriculture in Sri Lanka – Opportunities and Challenges*

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Introduction

Sri Lanka is situated between 6 and 10 degrees north of the equator and 80 to 82 degrees east near the southern tip of the Indian sub-continent. It is accorded with a climate that varies from tropical to subtropical. Based on average annual rainfall Sri Lanka is divided into three climatic zones: wet, intermediate and dry. These climatic zones are subdivided into seven major agro-ecological zones by latitude, temperature and landform. Further, these can be subdivided into 46 well-defined agro-ecological regions, each with its unique combination of rainfall pattern, elevation, landform, temperature and soil types (Figure 1). Sri Lanka has an area of 65,610 km² and a population of 19.9 million, of whom 72 per cent live in rural areas 22 per cent in urban areas, and the balance of 6 per cent in estates. The population is increasing at an average annual rate of about 1.1 per cent. The population density is 317 per km² and there is an average of ratio of one person to 0.08 ha of agricultural land.

Sri Lanka is known as an agricultural country and is endowed with fertile arable land, which makes it potentially self-sufficient in food in overall terms, enabling her to produce plantation crops such as tea, rubber and coconut as sources of foreign exchange. The agricultural sector (agriculture, forestry and fisheries) accounts for about 17 per cent of GDP, 18.8 per cent of domestic exports and 30.7 per cent of employment. Agriculture includes plantation crops (tea, rubber and coconut), paddy, other field crops (coarse grains, pulses, condiments, oil seeds) horticultural crops (fruits, vegetables, root and tubers, flowers and ornamental plants), minor export crops (cloves, pepper, cinnamon, coffee, cocoa and citronella, etc.) and livestock. Non-plantation agricultural crops contributed to 11 per cent of

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GDP in 2006. The average annual rate of growth of the agriculture sector during the last four years was 1.2 per cent. It is central to the livelihoods of the rural poor who account for the majority (around 70 per cent) of the poor. The industrial sector, which is the second highest, accounts for about 27 per cent of GDP, essentially in the form of manufacturing. The service sector contributes to 56 per cent of total GDP.

Sri Lanka's economic growth in the past three decades has been around 5 per cent and the annual per capita income in 2006 was US\$ 1,335. The poverty ratio at national level is 23 per cent in terms of the poverty head count ratio. The experience of the last few decades suggests that the benefits of economic growth have not trickled down to many segments of the poor.

An overview of poverty in Sri Lanka

Poverty is a multi-dimensional phenomenon and it has been defined differently by different stakeholders. It encompasses economic, social, governance and peace dimensions. In addition to low incomes that lead to an inability to satisfy the basic economic needs, the poor have to contend with gaps in access to good education, health care, quality shelter, water and sanitation. These in turn stifle both the individual initiative and drive for personal advancement – qualities essential to break out the vicious cycle of poverty. It has been generally accepted that measuring economic dimensions of poverty is inadequate and there is need to use a multi-dimensional approach which encompasses social, human and even political dimensions such as empowerment and vulnerability. However the economic (income) dimension of poverty, which is measured through a monetary approach and which influences other dimensions of poverty, are related to agriculture. Therefore, this overview only focuses on the economic dimensions of poverty, which is measured through absolute poverty, relative poverty and income inequality.

According to Jabber and Senanayake (2004) absolute poverty is defined as subsistence below the minimum requirement of physical well-being. A widely used measure to describe absolute poverty is the poverty line, which stipulates a standard amount of goods/services required by households to meet their basic needs. According to the global poverty lines, measured by US\$ 1 per day and US\$ 2 per day, 6.6 per cent (US\$ 1/day) and 45.4 per cent (US\$ 2/day) of Sri Lankans are in poverty. The incidence of poverty at the national level has declined from 26.1 per cent in 1990-1991 to 22.7 per cent in 2002, by 3.4 percentage points. However the actual number of poor people has increased over this period from 3.7 to 3.8 million. The World Bank (2005) estimated that between 1995-1996 and 2002 the poverty head count ratio would have fallen from 29 per cent to 12 per cent if the distribution of consumption had not changed during this period. The change in income inequality during this period is shown in Table 1.

The consistent increase of the Gini coefficient indicates the widening of income inequality during 1980-1981 to 2002. From the bottom up to sixth deciles of the population have experienced a gradual reduction of their percentage shares in total household income per capita. The income share of the top 20 per cent of the population has increased from 41.2 per cent to 52.8 per cent during the same period. Although, a gradual increase in income inequality throughout this period is observed, the widening of income inequality during 1980-1981 to 1985-1986 period is very conspicuous by all indicators.

This sharp increase in consumption inequality might have reduced poverty, thereby reducing impact of growth, i.e. the benefit of growth accrued mainly to the non-poor. Gunathilake (2005) revealed that although income distribution was deteriorating, all quintiles had experienced an improvement in real mean monthly incomes between 1990 and 2002. While for the lowest two quintiles the gain was small, Rs. 34.84 and Rs. 60.30 respectively, for the highest quintile it was Rs. 422.05. In addition the armed conflict in the North and East has both directly and indirectly contributed to existence of high level of poverty in the country despite the moderate level of growth. The incidence of poverty among households in urban and rural sectors has declined by 52 per cent and 16 per cent respectively over the last two decades (Table 2). However, actual numbers in poverty in urban areas have declined from 0.5 to 0.2 million people and increased in rural areas from 3 to 3.4 million people. Estate-sector poverty incidence increased dramatically, but the number of people in poverty remained static at 0.2 million suggesting that there was a major decline in the total estate population over this period. Further, high incidence of poverty in rural and estate sectors indicates that poverty is mainly a rural and estate-sector phenomenon in Sri Lanka.

Table 1. Sri Lankan income distribution among income deciles during 1980-1981 to 2002

Total household income by per capita income deciles (%)					
Decile	1980/81	1985/86	1990/91	1995/96	2002
Lowest	3.5	2.4	1.9	2.1	1.7
Second	5.3	3.8	3.3	3.5	3.1
Third	5.9	4.5	4.3	4.4	4.1
Fourth	6.7	5.3	5.3	5.3	5.0
Fifth	8.0	6.2	6.4	6.4	6.0
Sixth	8.6	6.9	7.5	7.4	7.3
Seventh	9.4	8.3	9.2	9.0	8.8
Eighth	10.9	10.0	10.8	11.4	11.2
Ninth	13.8	13.5	14.8	15.6	15.4
Highest	27.4	38.8	36.5	34.8	37.4
Cumulative lowest 20%	8.8	6.2	5.2	5.6	4.8
Next 20%	12.6	9.8	9.6	9.7	9.1
Lowest 40%	21.4	16	14.8	15.3	13.9
Top 20%	41.2	52.3	31.3	50.4	52.8
Ratio top 20% to bottom 40%	1.9	3.3	3.5	3.3	3.8
Gini coefficient	0.31	0.43	0.44	0.46	0.47

Source: Fresh perspective: Exploring alternative dimensions of poverty in Sri Lanka (2007).

Table 2. Percentage of households below the poverty line by sector

Sector	1990/91	1995/96	2002 % change of poverty H.C. Ratio 1990/91-2002
Urban	12.9	11	6.2 - 52
Rural	24.7	25.9	20.8 - 16
Estate	16.7	32.2	24.3+

Source: Department of Census and Statistics.

Poverty and inequality are strongly related and therefore it is important to examine how income inequality has changed over time. Income inequality has increased dramatically from 1980-1981 to 2002, possibly due to the liberalization policy reform of 1977, which led to a change in focus from social welfare to creating an environment which was conducive to export-led growth (Table 1).

Poverty alleviation policies and programmes

From time to time, successive governments since independence in Sri Lanka have implemented several programmes aimed at the poor. Food rations (Second World War) and food stamps (1979-1989) were main programmes implemented targeting the poor. Under these programmes food grants were provided to the poor. Realizing that provision of food grants does not help to moving the people out of the poverty trap, the government replaced

the food stamp programme with the *Janasaviya* (strength of the people) programme (1989-1994) aiming to create opportunities for the poor to participate in the economic growth process in a productive manner, while continuing the relief assistance. Under this programme Rs. 2,500 was allocated per family per month comprising a food grant of Rs. 1,458 and a compulsory saving of Rs. 1,042. During 1989-1994 this programme covered about 546,910 families.

The *Samurdhi* programme introduced in 1995, replaced the *Janasaviya* programme and is still in operation. The *Samurdhi* programme promotes savings among the poor and provides loans at low interest rates for income-generating activities of the poor. The main objective of this programme was to bring all major welfare programmes under the umbrella of the *Samurdhi* programme. The original programme was planned to extend the welfare benefit to 1.2 million low-income families. However the number of beneficiaries has increased to over 1.9 million at the end of 2006. In addition to The *Samurdhi* programme, in order to improve the nutrition of poor people, programmes involving the distribution of food baskets for pregnant mothers and *thripasa* for pre school children, day meal for school children, are implemented.

In addition to this main programme, the present government has implemented a number of programmes aimed at the local rural and agricultural economies in a wider process of economic growth through development of infrastructure. These are *Gemi Diriya* (courage of the village) project, the Tank Rehabilitation programme, *Maga Neguma* (rehabilitation of rural roads and minor extension), and Technology to Village, *Pubudamu Wellassa, Rajarata Navodaya*.

Gemi Diriya: This programme focuses on developing rural infrastructure, strengthening market facilities, credit and technical support services to the poorer communities, strengthening local governments' planning and implementation capacities, and ensuring effective involvement of the communities in the programming of investments and their implementation. At least 75 per cent of the households in the project area would benefit from increased income, improved access to social and economic infrastructure. At least 50 per cent of national, provincial and district budgetary resources for rural development are planned to channel directly to community organization for implementation of the development programmes.

Tank Rehabilitation: This is a flagship project highlighted in the Economic Policy Framework of the present government. The project recognizes the augmentation of water supply in basins, where water stress exists, by harnessing rainwater and storing it in existing

and abandoned village tank systems. In addition, diversion of perennial water by means of anicuts to farm lands through supply canals for cultivation is also recognized. It also proposed to develop identified tanks in an integrated manner.

Maga Neguma (Rehabilitation of rural roads and minor extension): The objectives of this programme include providing transport facilities to the rural population and speedy transport facilities for conveying agricultural products to the market. The total cost of this project is US\$ 60 million.

Gamata Thaakshanaya (Technology to Village): This technology transfer programme involves a) establishing a computer-linked *Vidatha* resource centre in each of the 320 Divisional Secretary areas, and (b) establishing science and technology societies at village level.

Pubudamu Wellassa (Bloom of Wellassa): The objective of this programme is to implement an accelerated development programme dedicated to the *Badulla* and *Moneragala* districts. The main focus is on providing rural infrastructure facilities.

Rajarata Navodaya (Dawn of Rajarata): The objective of this programme is to implement an accelerated development programme dedicated to the *Anuradhapura* and *Pollonnaruwa* districts. The main focus is on providing infrastructure facilities including minor irrigation schemes, feeder roads, and basic health facilities and transport.

Realizing the importance of the growth of the agriculture sector in order to alleviate rural poverty as well as economic development of the country through increasing farm and labour productivity and income in agriculture, the Government of Sri Lanka has been implementing a series of policies and programmes since independence. The fertilizer subsidy scheme, agriculture credit facilities, price support schemes and import restrictions are the Government policies implemented in broad terms. Fertilizer prices have been subsidized for nearly 4.5 decades with different rates in different time periods, with the objective of encouraging farmers to use fertilizers in adequate amounts at correct stages and thereby enhancing the level of agricultural productivity. Currently paddy farmers who are registered at the Agrarian Service Centres were eligible to obtain fertilizer at a subsidized rate of Rs. 350 (US\$ 3.09) per 50 kg bag. Further, farmers who cultivate subsidiary food crops (chilies, maize, onion, big onion and vegetable) in paddy land during the *yala* season are also eligible to obtain fertilizer at subsidized rates. Smallholders who own less than 5 acres of tea, rubber and coconut land are also provided with a 50 kg bag of urea at a less subsidized rate of Rs. 1,200 (US\$ 100). In terms of output price policy, the Government has established the Agricultural Products Marketing Authority to enhance a fair

price for agricultural produce. The Field Crop Research Development Institute Development Project, the Rice Research Development Institute Development Project, the Crop Zoning programme, The National programme on increasing domestic food production and forward sales contract, are the main national programmes implemented at present.

Rice, being the staple food and responsible for employing half of the total agriculture labour force, was given highest priority. As a result the rice sector has shown a significant growth and Sri Lanka has achieved near self-sufficiency in rice at a personal consumption level. Expansion of area under irrigation, productivity improvement coupled with high yielding varieties, and rice-biased government policy, such as price support schemes, have contributed towards achieving self-sufficiency in rice. Today rice farming occupies around 730,000 ha of land. Out of this around 46 per cent is irrigated land. Production of subsidiary food crops was encouraged during 1970-1977 through import restriction. However, a subsidiary food crop sector is lagging behind the desired level. Despite the satisfactory overall annual economic growth of 5 per cent experienced by Sri Lanka during last decade, the annual growth in the agriculture sector has been paltry.

Government perspective on reducing poverty

Strategies for poverty reduction vary across various stakeholders. The common strategies on which most agree include: i) transferring cash to the poor; ii) increasing farm and labour productivity and income in agriculture; iii) including the local rural and agricultural economies in a wider process of economic growth; and iv) reducing costs and increasing prices through subsidies. In Sri Lanka all these strategies are being used to different degrees. Some policies and programmes related to these strategies were given in a very concise manner in the above sections of the report. However the Sri Lankan Government believes that provision of a cash grant does not help to move people out of the poverty trap. The strategy of increasing farm and labour productivity, increasing income in agriculture and including the local rural and agricultural economies in a wider process of economic growth are considered more important.

Agriculture has an important role to play in the struggle against poverty: It is central to the livelihoods of the rural poor who, in spite of urbanization, still account for the majority (around 70 per cent) of the poor. Raising the growth in agriculture can make an important contribution to rural poverty reduction through increasing income and employment. Food insecurity is a poverty-related problem. Agriculture contributes to food security by helping to keep prices low so that food is affordable to the poor, providing income and employment

that help poor people access food, and providing a tax base to support service delivery that helps ensure access to food by poor people. Realizing the importance of agriculture to accelerate overall economic growth and thereby reducing poverty in alignment with the Millennium Development Goals, the Sri Lankan Government has set out the vision for the agriculture sector as 'an agriculture sector contributing to regionally equitable economic growth, rural livelihood improvement and food security through efficient production of commodities for consumption, for agro-based industries and for exporting competitively to the world market'. In order to achieve this vision the government has presented its agriculture policy. The goals and objective of this policy, in broad terms are: i) increase domestic agricultural production to ensure food and nutrition security of the nation; ii) enhance agricultural productivity and ensure sustainable growth; iii) maximize benefits and minimize adverse effects of globalization on domestic and export agriculture; iv) adopt productive farming systems and improved agro-technologies with a view to reduce the unit cost of production and increase profits; v) adopt technologies in farming that are environmentally friendly and harmless to health; vi) promote agro-based industries and increase employment opportunities; and vii) enhance the income and the living standards of farming communities.

Agriculture and poverty

Rice farming is the main agricultural activity of rural people in Sri Lanka and about 1.5 million farm families are engaged in rice farming. The rice sector in Sri Lanka has achieved spectacular performance in the last four decades (Figure 2). Total rice production has nearly achieved self-sufficiency. Yields have increased two-fold during the past four decades. A rice biased policy environment, the expansion of area under irrigation and improved technology (high-yielding varieties) favoured this performance. However, the performance of the rice sector has little impact on smallholders living in rainfed and marginal areas where people are more vulnerable to food insecurity (Figure 3) and poverty where is concentrated. Badulla, Moneragal and Hambanthota districts are highly rainfed and marginal districts. In these districts the incidence of poverty is high compared to other districts (Table 3).

Figure 2. Trend in extent, production & average yield of rice

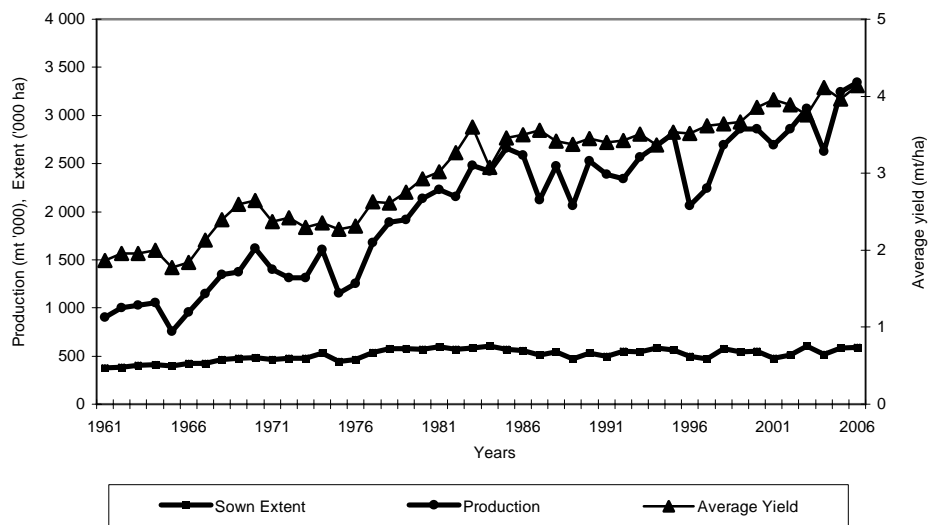
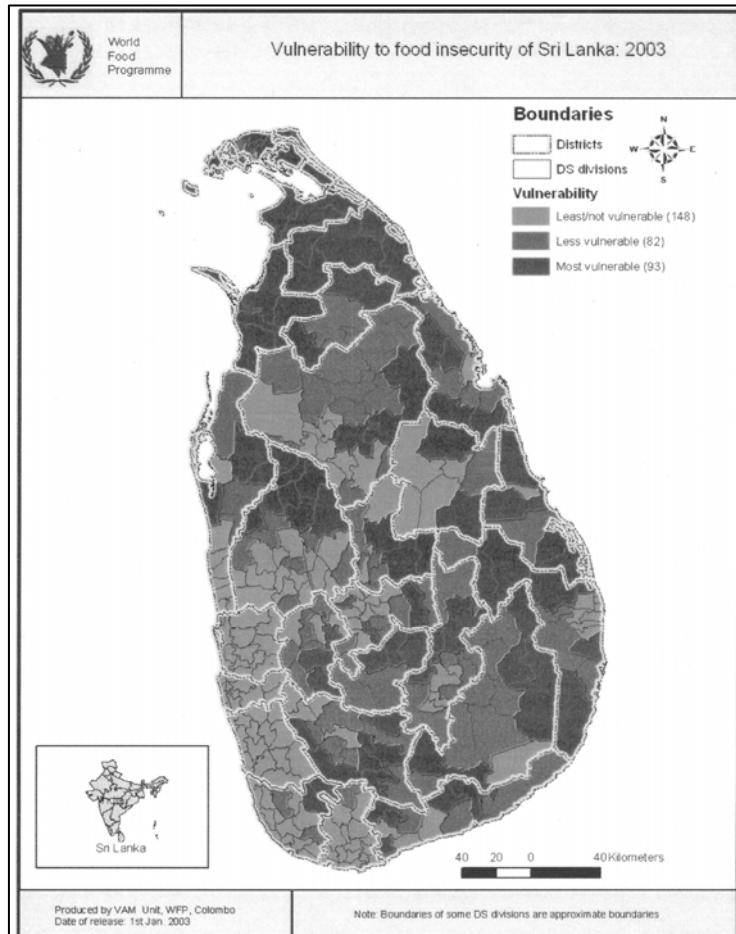


Table 3. Percentage of poor population by district

District	1990/91	1995/96	2002
Colombo	16	12	6
Gampaha	15	14	11
Kalutara	32	29	20
Kandy	36	37	25
Matale	29	42	30
Nuwaraeliya	20	32	23
Galle	30	32	26
Matara	29	35	27
Hambantota	32	31	32
Kurunegala	27	26	25
Puttalam	22	31	31
Anuradhapura	24	27	20
Polonnaruwa	24	20	24
Badulla	31	41	37
Moneragala	34	56	37
Rathnapura	31	46	34
Kegalle	31	36	32
National	26.1	28.8	22.7

Source: Household Income and Expenditure Survey.

Figure 3. Vulnerability to food insecurity in 2003



The agro-ecological condition in these areas favours the cultivation of subsidiary food crops. The districts in Sri Lanka in which growing of subsidiary food crops is concentrated have been identified based on the calculation of the 'Specification Quotient' or 'Specialization Index' by Mahrouf (2004) (Table 4). This analysis shows that growing of subsidiary food crops is concentrated in these districts. Figures 4 to 8 show the distribution of subsidiary food crops in Sri Lanka.

Table 4. Major districts of growing subsidiary food crops based on estimation of specialization quotient

Crop	Major districts growing CGPRT crops	Specialization quotient (SQ)
Maize	Anuradhapura	1.0530
	Badulla	1.0094
	Moneragala	0.8606
	Ampara	0.5551
Finger millet	Anuradhapura	4.6291
	Moneragala	3.2789
	Hambantota	2.8996
	Kurunegala	0.9656
Mungbean	Hambantota	2.7353
	Moneragala	2.4564
	Kurunegala	1.3219
Black gram	Anuradhapura	6.3417
	Mullativu	5.1069
	Vavuniya	3.6199
Soybean	Anuradhapura	27.6266
	Mahaweli 'H'	5.6231
	Matale	4.2784
	Nuwara Eliya	1.3447
	Kilinochchi	1.1002
Cowpea	Ampara	2.7051
	Moneragala	1.6077
	Hambantota	1.0087
Ground-nut	Moneragala	2.5481
	Ampara	1.2280
	Mullativu	1.7405
	Hambantota	0.9509
Sweet Potato	Matale	2.0410
	Kurunegala	1.6274
	Moneragala	1.5849
	Ratnapura	1.3878
	Badulla	0.9973
	Gampaha	0.9045
Cassava	Kurunegala	0.5632
	Gampaha	0.3919
	Ratnapura	0.3784
	Moneragala	0.2960
Potato	Badulla	16.1009
	Nuwara Eliya	2.8762

Source: Mahrouf, 2004.

Figures 4.

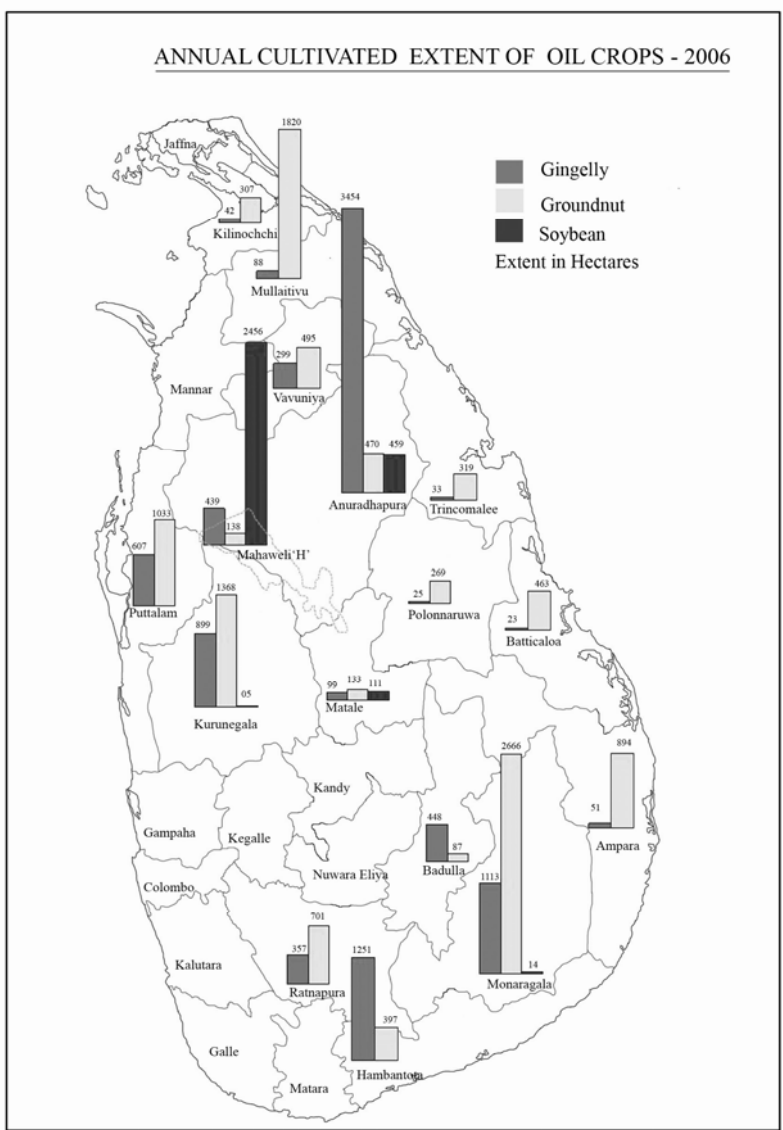


Figure 5.

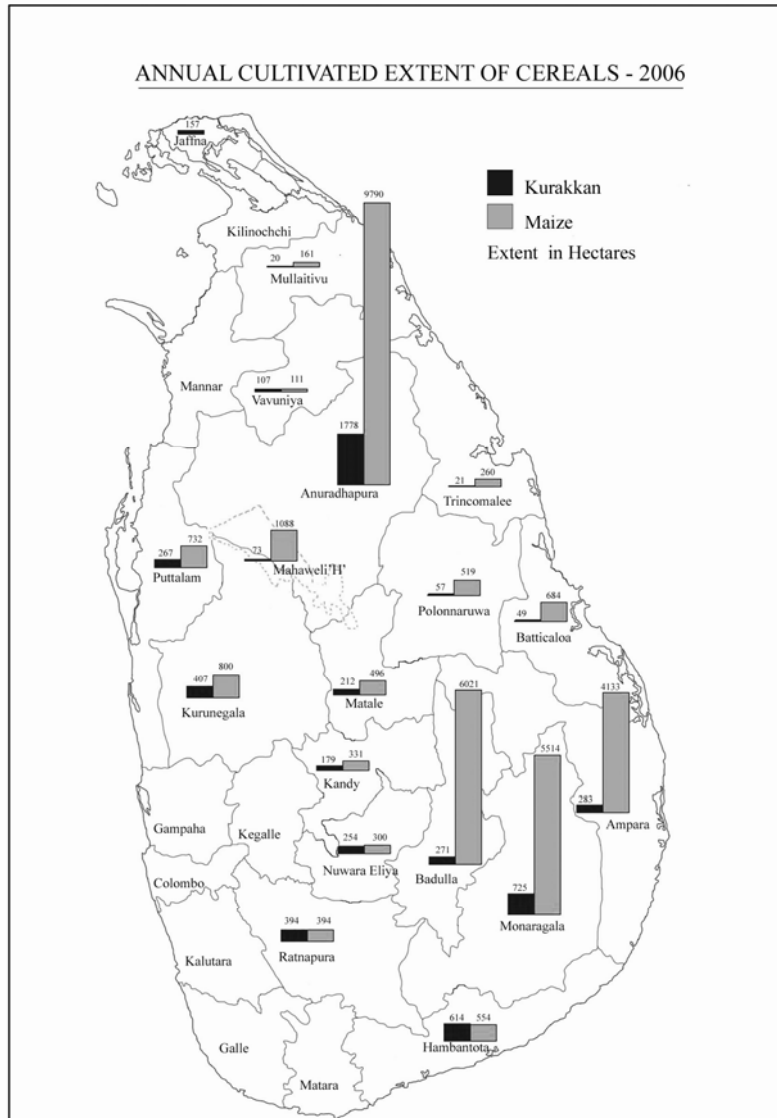


Figure 6.

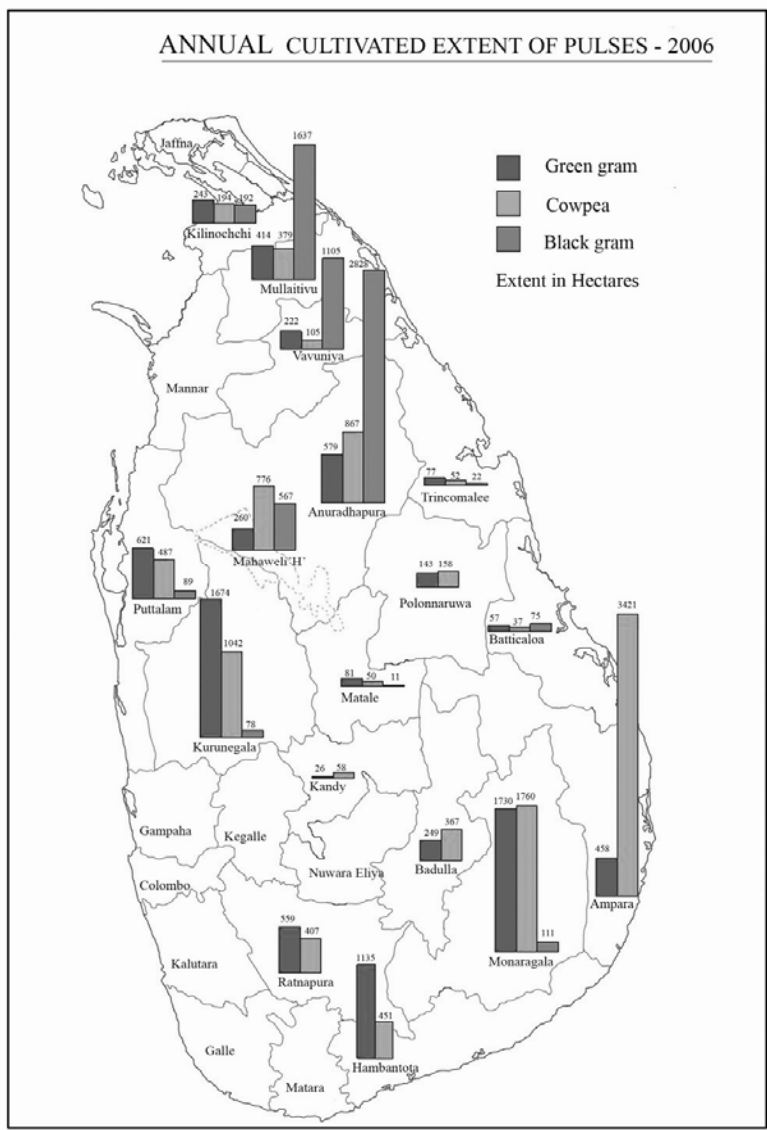
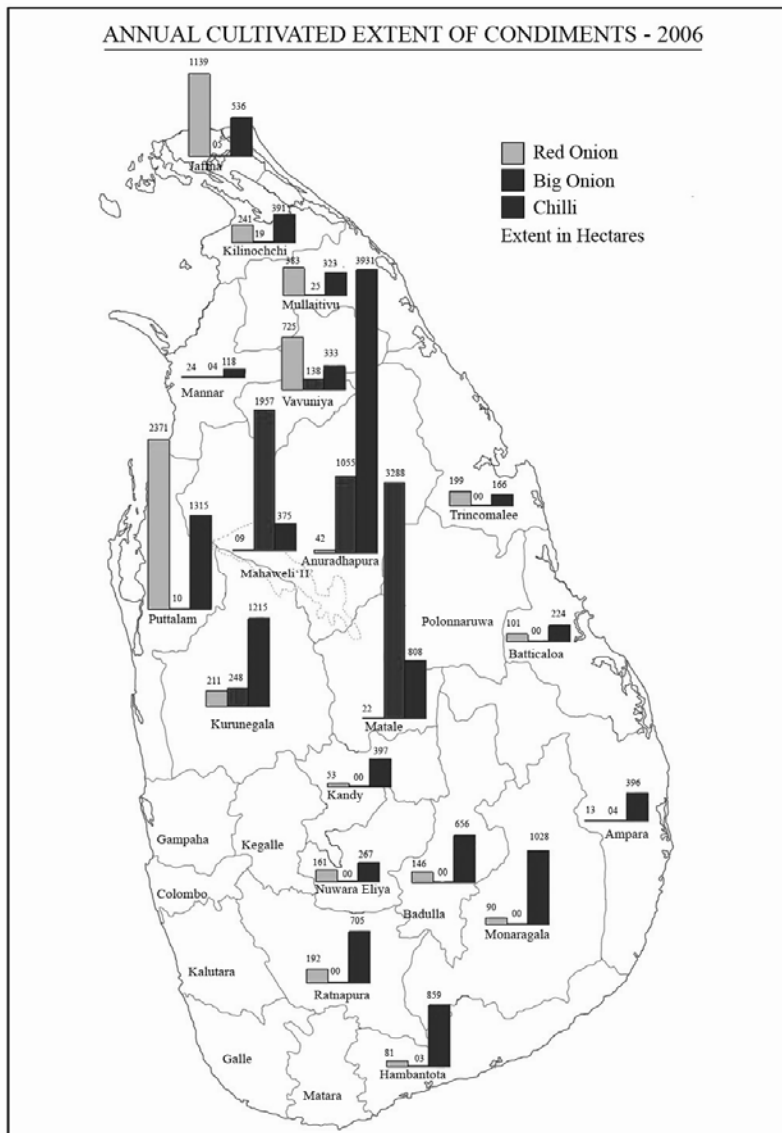


Figure 7.



Compared to rice production, much of the subsidiary food crops production in Sri Lanka does not show a clear increasing trend. Figures 8 to 14 show the trend in area, production and yield of major subsidiary food crops grown in Sri Lanka.

Figure 8. Trend in extent production & average yield of mungbean

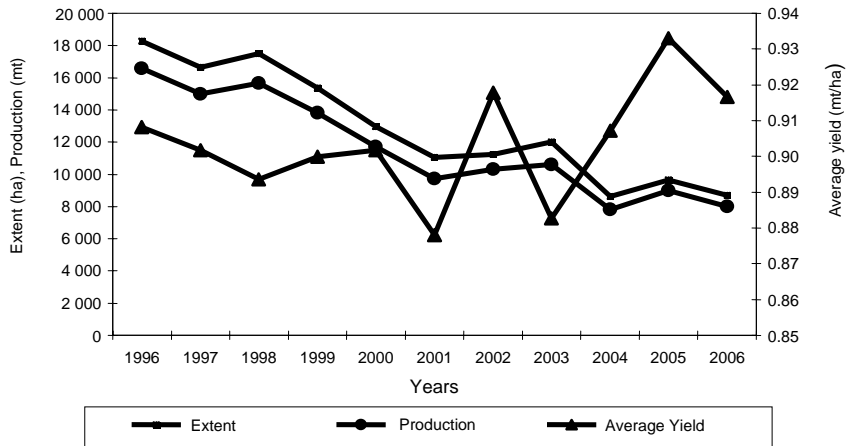
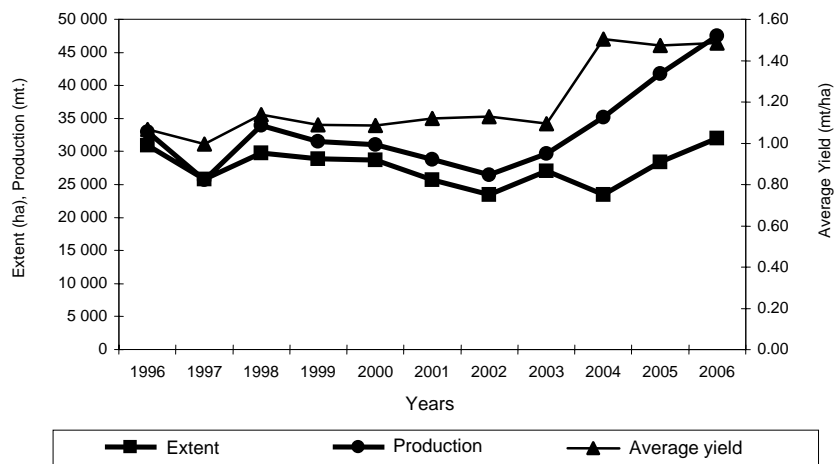


Figure 9. Trend in extent production & average yield of maize



In general, the SFC sector has shown a declining extent (land under cultivation) and production in recent years. Maize, soybean, ground-nut and potato are the crops that have shown increasing trends in extent and production during recent years. Increases in the relative prices of the produce of these crops during recent years have been the major cause of this increased extent in these crops. From these crops, the increase in potato extent could be mainly attributed to the relatively high protection given to this crop, which is very important to the poverty stricken Badulla district and also the Nuwara ELLiya district. Because of the existing international and national trends in rising prices of maize and soybean, the extent under these two crops is likely to increase in the future. The rapid economic growth in China and India are likely to rapidly change net food importing patterns, particularly of maize and soybean, which are mainly used for the provender industry.

Despite the relative price increase of pulses, the extent under pulses such as green gram, cowpea and black gram have been declining. The former two pulses, which have been mainly used as subsistence crops, have lost their importance with increasing population pressure and environmental regulations that inhibit shifting types of cultivation. Increasing competition from perennial crops in home gardens has also contributed to the declining extents of these crops.

Figure 10. Trend in extent production & average yield of cowpea

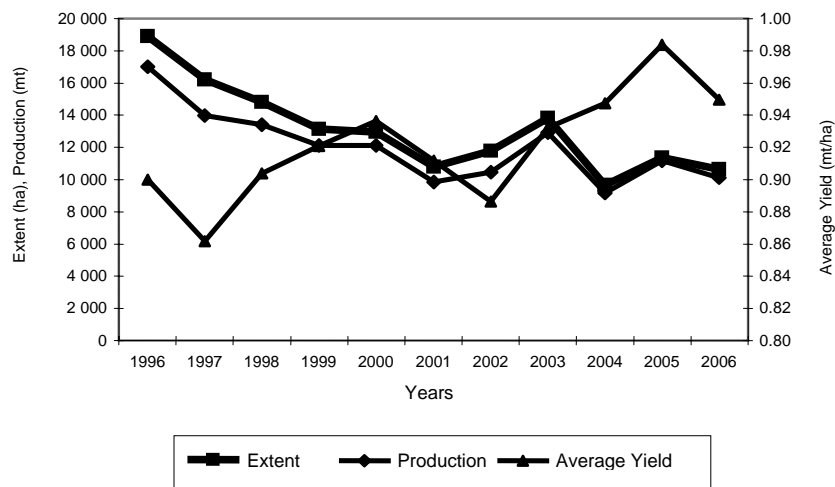


Figure 11. Trend in extent production & average yield of blackgram

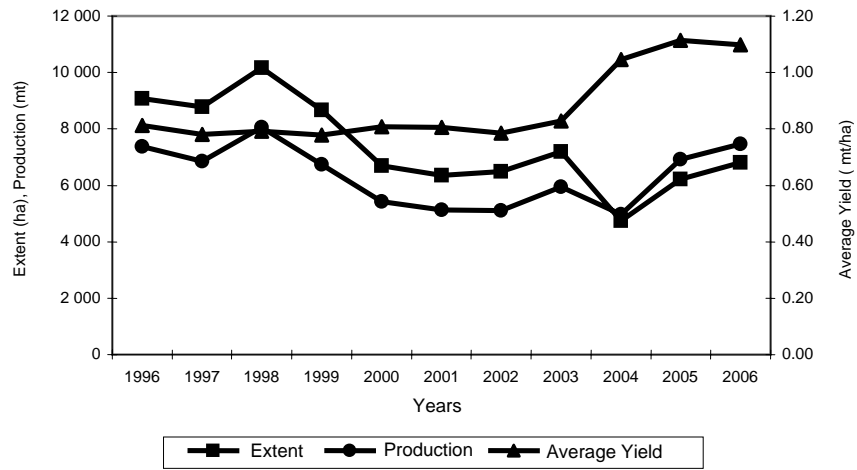


Figure 12. Trend in extent production & average yield of soybean

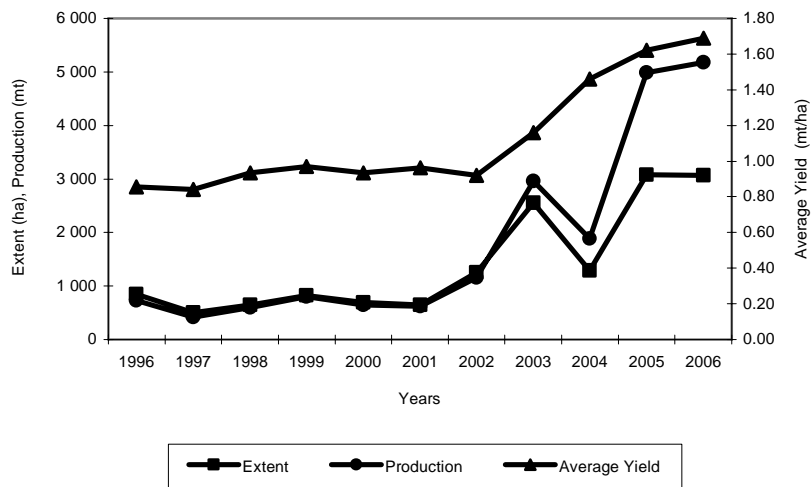


Figure 13. Trend in extent, production & average yield of ground-nut

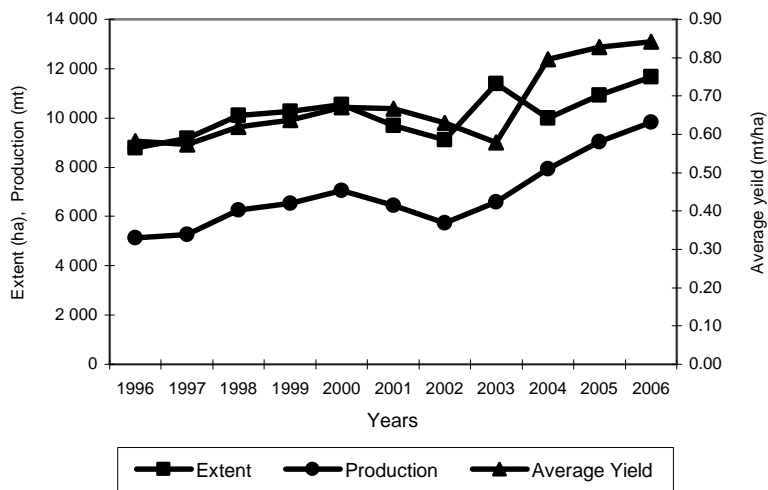
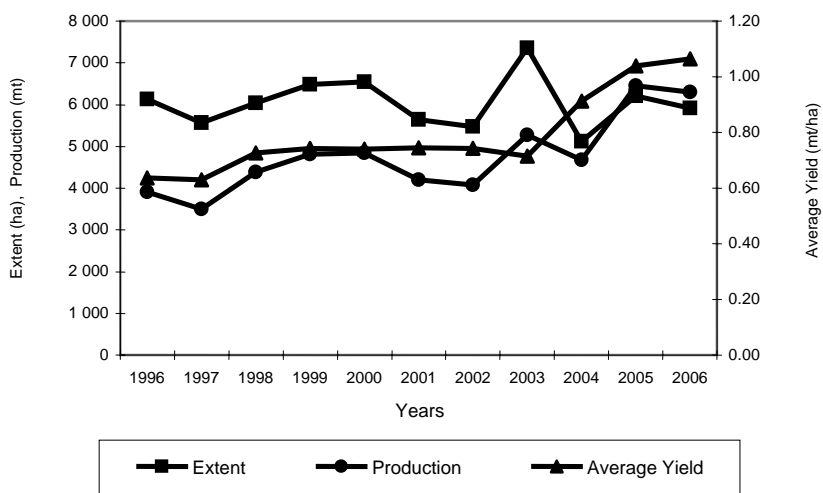


Figure 14. Trend in extent, production & average yield of Kurakkan



It seems that many factors have contributed to these trends in production of subsidiary food crops. Among them uncertainty under rainfed cultivation inadequate storage and processing facilities, agro-based industries and small landholdings are important.

There is high demand for subsidiary food crops in Sri Lanka. At present maize, soybean and potato are imported in large quantities into Sri Lanka. Table 5 shows the imports of subsidiary crops to Sri Lanka.

Table 5. Imports of subsidiary food crops

Year	Maize (seed)	Maize (other)	Finger millet	Soybean	Mung bean	Black gram	Ground nut	Potato (seed)	Potato (consumption)
Q u a n t i t y (mt)									
1996	35 502	56 076	499	285	22	4 034	1 194	5 200	25 784
1997	10 859	70 382	1 254	200	2 091	1 659	1 756	1 122	108 403
1998	38 358	68 179	695	179	5 132	677	2 350	1 706	115 613
1999	66 669	58 956	277	1 830	7 528	4 928	4 348	1 764	128 921
2000	7 864	115 248	551	2 972	6 767	7 332	4 382	2 794	116 453
2001	69	157 334	816	3 166	8 717	7 891	4 890	6 725	62 559
2002	7	94 588	1 134	3 512	7 121	6 939	5 494	7 028	37 997
2003	8 247	128 450	610	1 451	8 181	7 597	2 680	5 031	40 487
2004	84	148 782	1 829	1 607	12 673		4 199	3 724	28 014
2005	80	14 940	1 380	1 308	9 321	1 589	4 691	5 718	40 746
2006	348	83 695	1 933	212	11 495		5 023	2 245	46 554

Concluding remarks

The experience during the last few decades suggests that the benefit of growth has not adequately trickled down to many segments of the poor. Despite reasonable average growth (5 per cent for the overall economy and around 1.2 to 1.4 per cent growth in the agricultural sector) coupled with significant growth in the rice sector, poverty still remains pervasive in the country. Therefore, there is a need to redesign the policies and programmes to exploit the potential sectors that are lagging behind the desired levels in order to alleviate rural poverty in the country.

Agriculture has an important role in the fight against poverty: It is central to the livelihoods of the rural poor who, in spite of urbanization, still account for the majority (around 70 per cent) of the poor. Raising the growth in agriculture can make an important contribution to rural poverty reduction through increasing income and employment.

Development of the subsidiary food crop sector is an important step in reducing poverty in rainfed and marginal areas where incidence of poverty is high. In order to develop the subsidiary food crop sector creating favourable policies, developing appropriate technologies (high-yielding varieties, agronomic practices, post-harvest technology) and dissemination of these technologies are important.

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Country Paper from Viet Nam*

*Nguyen Van Nghiem***

Overview

Overview of Viet Nam's economy in 2006

In 2006, along with fundamental advantages brought about by 20 years of development, the Vietnamese economy faced a number of natural calamities: drought in the early months of the year followed by mega typhoons and torrential rains and floods in the remaining months devastated the country's economy. Anthrax broke out over a large area. Different kinds of insects devastated rice crops in the Mekong River Delta causing great losses. Prices of some key commodities in the world markets such as gasoline, fertilizers, and pesticides fluctuated greatly. The EU market for leather shoes shrunk. However, thanks to the close direction of the Government with appropriate solutions and measures, and the efforts of enterprises and the business community, the Vietnamese economy still developed strongly in 2006.

The economy attained a high growth rate in 2006. Most key economic targets set by the National Assembly were achieved or exceeded. gross domestic product (GDP) grew at 8.17 per cent (planned at 8 per cent), of which the agricultural, forestry and aquatic sectors grew at 3.4 per cent (against the planned 3.8 per cent), the industrial and construction sectors grew at 10.37 per cent (planned at 10.2 per cent), with industry growing at 10.28 per cent. The services sector's growth was 8.29 per cent higher than the planned 8 per cent target.

GDP per capita reached more than VND 11.5 million, equivalent to US\$ 722 which is US\$ 80 higher than the 2005 figure.

Viet Nam's rural sector with 9.3 million hectare of productive agricultural land, 76 per cent of the population and 72 per cent of the labour force is an important economic sector.

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** Department of Co-operatives and Rural Development, Ministry of Agriculture and Rural Development, Viet Nam.

In 2006, the production value of agricultural, forest products and rural trade grew at 4.4 per cent, up from 3.6 per cent in 2005 (crops production value rose: by 2.7 per cent, livestock: by 7.3 per cent), forestry increased by 1.2 per cent, and rural services increased by 2.7 per cent. The added value of agro-forestry sector increased 2.77 per cent (agriculture up by 2.84 per cent, forestry up by 1.14 per cent). The proportion of agro-forestry reduced from 21.2 per cent in 2005 to 20.4 per cent in 2006 and contributed 0.67 per cent to GDP growth.

Table 1. Socio-economic statistical data, 2005-2006

Items	Unit	2005	2006
1. Gross domestic product (at current prices)	billion Dong	839 211	973 790
2. GDP growth		8.4	8.17
- Agriculture forestry & fishery	percentage	4	3.4
- Industry and construction		10.6	10.37
- Service		8.5	8.29
3. Economic structure			
- Agriculture forestry & fishery	percentage	21.2	20.4
- Industry and construction		40.97	41.52
- Service		38.01	38.08
4. Contribution to GDP growth			
- Agriculture forestry & fishery	percentage	0.8	0.67
- Industry and construction		4.2	4.16
- Service		3.4	3.34
5. GDP per capita	USD	639	722
6. Exported goods and services	billion USD	36.49	44.7
7. Imported goods and services	billion USD	41.92	49.53
8. Population	million	83.2	84.11
9. Labour and employment	million	42.71	43.44

Table 2. Agriculture statistical data, 2006

Items	Unit	2006
1. Increasing of Agriculture output values:	percentage	4.4
- Agriculture	percentage	3.6
- Forestry	percentage	1.2
- Fishery	percentage	7.7
2. Total area of whole country	thousand ha	33 121.2
3. Total area of Agricultural land	thousand ha	24 583.8
- Agricultural production land	thousand ha	9 412.2
- Forestry land	thousand ha	14 437.3
- Water surface land for fishing	thousand ha	701.6
- Land for salt production	thousand ha	14.1
- Others	thousand ha	18.6
3. Cereal production	million tons	39.65
4. Fishery production	thousand tons	3 697.9

Total exports of agro-forestry products in 2006 gained VND 7.16 billion, an increase of 19.7 per cent over 2005. Such key products as rice, coffee, pepper, cashew nut and rubber continued keeping their position in the world market. Production of wood and wood-made products rapidly increased.

Table 3. Turnover and volume of exported agriculture products, 2006

Items	Exported volume		Turnover	
	2006 (tons)	2005 (%)	2006 (USD)	2005 (%)
Rice	4.7 million	-10	1.3 billion	-8.3
Coffee	887 thousand	-0.6	1.08 billion	47.8
Rubber	717 thousand	22	1.3 billion	62.5
Cashew nut	126 thousand	16.2	504 million	0.5
Tea	103 thousand	17	108 million	12
Pepper	119 thousand	9.3	198 million	31.5
Forestry products			2.16 billion	21

However, at present the quality of agro-forestry products for export is still limited reducing the competitiveness of Viet Nam's agro products. Especially in the context of Viet Nam becoming an official member of WTO, big opportunities and challenges face the country's producers and exporters. The Ministry of Agriculture and Rural Development is co-ordinating with other ministries and localities to prepare active methods and develop and improve production and trading policies of agro-products to meet WTO regulations.

Poverty reduction – overview

Viet Nam has succeeded in reducing poverty rates from over 30 per cent in 1992, to under 7 per cent in 2005 (according to the former poverty standards (period 2001-2005), income per person per month was VND 80,000 in mountain areas, VND 100,000 in rural areas and VND 150,000 in urban areas). The current standard is VND 200,000 in rural and VND 260,000 in urban areas. Using current standards the poverty rate fell from 23 per cent in 2002 to 22 per cent in 2005 and again to 15 per cent in 2007, largely due to rapid annual economic growth, averaging 8-9 per cent annually. Viet Nam has made remarkable progress, but lifting the remaining one-fifth of the population out of poverty will not be easy. People living in remote and mountainous areas, particularly ethnic minorities, now comprise a growing proportion of the population in poverty. Despite declining poverty, child malnutrition remains widespread. Increasing out-of-pocket expenditures for health and education represent a serious challenge to social equity. Rising inequality is another risk of rapid economic change as it can slow the rate of poverty reduction and erode social cohesion.

Poverty reduction activities

Viet Nam has many policies, programmes and projects to eradicate hunger and alleviate poverty. Poverty reduction activities planned for the period 2006-2010 include:

- The Prime Minister issued the Decision No.07/2006/QDD-TTg dated 10/01/2006 approving the Social-economic Development Programme for Extremely Difficult Communes in Ethnic Minority and Mountainous Areas for the period of 2006-2010 (Programme 135 phase II)
- The National Targeted Programme on Poverty Reduction (NTP-PR) (2006-2010) (P20 – launched by February)

The National Targeted Programme on Poverty Reduction and Programme 135 (2006-2010) has been playing an important role in reducing poverty and addressing inequalities by delivering additional resources and services to poor areas and poor households. By approving these two programmes, the Government has reconfirmed its commitment to reduce poverty further and to achieve both the Millennium Development Goals (MDGs) and the Viet Nam Development Goals (VDGs).

There are other related projects and programmes such as the national extension programme, compulsory primary education programme, rural clean water supply programme and the rural electricity supply programme.

Programme for Extremely Difficult Communes in Ethnic Minority and Mountainous Areas for the Period of 2006-2010 (Programme 135 phase II):

Objectives

Overall objective: Radically accelerate production and promote the agro-economic structural shift in the direction of market-driven production; sustain the improvement of spiritual and material living conditions of the ethnic people in extremely isolated communes and villages, and narrow the development gap between ethnic groups and other regions. By 2010, basically there will be no hunger-stricken households in the targeted areas, the number of poor households will drop below 30 per cent based on the poverty line specified in the Prime Minister's Decision No 170/2005/QD/TTg dated 08 July 2005.

Specific objectives include:

- *Production development:* improve skills and train the people of ethnic minorities in new production practices, accelerate the agro-economic structural shift, increase income and implement sustainable poverty reduction systems. By 2010, over 70 per cent of households will have obtained an average income per capita of over VND 3.5 million per year.
- *Infrastructure development:* Essential infrastructure facilities shall be provided to villages in line with population and production planning for improvement of living conditions of the people, production development and income generation.
- *Specific targets:* 80 per cent of communes will have car road connections to the village's centre; over 80 per cent of communes will have small-sized irrigation works to water 85 per cent of the total acreages of paddy fields; 100 per cent of villages will have enough schools, classrooms and semi-boarding schools where necessary; 80 per cent of communes will be provided with electricity in residential areas; demand for communal houses will be basically met; 100 per cent of villages will have health clinics with adequate facilities.
- *Improvement of the socio-cultural life of the people in extremely difficult villages:* over 80 per cent of households will use clean water; 80 per cent of households will have electricity; fatal diseases will be prevented and controlled; over 50 per cent of households will use hygienic latrines; over 95 per cent of school age children will be enrolled at primary schools and 75 per cent will be enrolled at secondary schools; over 95 per cent of people in need of legal assistance will receive free legal assistance.
- *Capacity strengthening:* village cadres and commune heads will be provided with skills and knowledge on professional and administrative management, poverty reduction; legal awareness will be raised, as will knowledge on investment management and operation management skills needed to fulfil their assigned tasks. Community capacity will be strengthened to promote effective community participation in the supervision of investments and other activities implemented in the areas.

Scope and targets of the programme

Scope of the programme: all mountainous and highland provinces, ethnic minority areas in the Southern provinces. Targets of the programme include:

- extremely isolated/difficult villages
- border villages, former revolutionary zones
- extremely difficult communes, hamlets of villages in Zone II.

From 2006 onward, uncompleted Programme 135 villages shall be reviewed to be included for investments; consideration shall be given to further inclusion in 2007 of extremely difficult villages and communes in Zone II in accordance with the criteria for classification of ethnic minority and mountainous areas based on development levels.

Criteria for being an extremely poor village

Living standards

- 70 per cent of households are poor households
- Three out of four hamlets having the following conditions: 25 per cent of dwellings are cottages; 50 per cent lack adequate water supply; 50 per cent lack electricity supply; 10 per cent of farmers use slash and burn agriculture

Production conditions

- Two out of three villages having the following conditions: 20 per cent are below average land tenure of commune; 50 per cent of land is rainfed land;
- Traditional production practices are used: no extension services; low level of market oriented production

Infrastructure

- No vehicle roads to commune centres
- Two out of three villages having the following conditions: lack of rooms for primary school; no radio system connected with commune; no community house in village.

Criteria for being an extremely difficult commune:

- One out of three extremely poor villages
- Poverty rate: 55 per cent or more
- Basic infrastructure: lack of six out of ten types of basic infrastructure
- Social conditions: three out of four villages having the following conditions:
 - Below compulsory primary education standards
 - Lack of normal health care; 50 per cent having no village health care staff

- 50 per cent no access to mass media
- 50 per cent local government staff having primary level job training

Main tasks of programme

- a) Support production development and economic structural shift, enhancing production levels of the ethnic minority people
- b) Provide essential infrastructure facilities to extremely difficult villages and communes
- c) Train and foster grassroots cadres, improve administrative and economic management skills and train community to strengthen capacity
- d) Provide services, improve people's living conditions and provide legal assistance to enhance awareness of laws.

Funding

- a) The State Government Budget provides provinces with financial support to achieve the targets defined in Item 2, Article 1 of the Decision. These funds are channelled to local provincial government annual budgets
- b) Annual local government budget
- c) Voluntary contributions to be mobilized through various modes from enterprises of all economic sectors, international organizations, individuals and international organizations and domestic sources.

Project and policy implementation

Programme 135 (Phase II) has four components implemented through specific projects and policies.

Project to support production development

The full name of this is the Project to Support Production Development and Economic Re-Structuring, Skills Improvement and Training on New Production Practices for Ethnic Minorities. The target beneficiaries are:

- a) Poor households – (identified according to the Prime Minister's Decision No. 170/2005/QĐ-TTg dated 08/07/2005 to issue a poverty line for the 2006-2010 period) are provided, on a priority basis, with additional service support by the project.
- b) Groups of households: Beneficiary groups of households shall meet the following criteria: groups consist of poor households and others living in the same village, having a common interest in production development and volunteering to help one

another; groups have a commitment or regulations defining clear responsibilities, rights and contributions (in labour, kind and cash) of each group member to implement the component and have a plan to use the allocated budget to improve incomes and generate jobs for group members; groups have a group leader appointed by the group to manage the group; and the proportion of poor households is determined by the Commune People's Committee (CPC) based on local conditions.

The households and groups of households shall be selected on a transparent, democratic and participatory manner where priority will be given to the poorest to receive investment first. The CPC chairman shall prepare a list of households and groups of households through the Standing People's Council to submit to the DPC for approval.

The Project to Support Production Development includes the following *Specific investment projects*:

- a. Support for agricultural, forestry, aqua-culture and industrial extension services. This includes: (i) disseminating advanced technologies, techniques, market information and prices; and printing, publishing and disseminating production procedures for crops, domestic stocks, post-harvesting, processing of agro-forestry products; (ii) providing training and vocational training to improve rural and agricultural economic management skills and knowledge; organize study tours to learn good practices in the area or in other areas; and developing demonstration models of advanced technologies in agricultural, forestry and fishery production.
- b. Support development and replication of production models. This includes: models of advanced technology transfer in: farming, livestock, aquaculture and agro-forestry and fishery processing; models of production-based processing and post-harvesting market-demand for agro-forestry and fishery products; and models of rural agricultural economic structural shift.
- c. Support for supply of plant seed, young animals and production materials (applicable to poor households). This entails: animal inputs (cattle, small livestock, poultry and fish species), food crops, industrial, forestry and fruit trees and medicinal plants of high productivity and appropriate quality to local conditions; and chemical fertilizers, veterinary medicine, insecticides, pesticides and other materials.
- d. Support procurement of equipment for processing and post-harvesting. This involves: dryers, equipment for post-harvesting and processing of agro-forestry products; and equipment and tools for processing and post-harvesting of agro-forestry and fishery products.

Project to support infrastructure development

Target Investment projects in communes are targeted at: (a) transport networks connecting communes and villages to one another (no funds from Programme 135 are allocated for construction of roads to the commune centre); (b) small irrigation works to be used within the commune or its clusters of villages; (c) commune to village electricity supply systems (no funds from Programme 135 are allocated for building of electricity lines to the commune centre); (d) construction of new schools and classrooms and upgrading old ones at the commune centre together with provision of electricity, clean water, benches, desks, facilities for semi-boarding students, accommodation for teachers; as well as construct primary and nursery school classrooms and kindergartens, accommodation for teachers and other needed accompanying facilities in villages where necessary; (e) building new commune health stations and upgrading old ones together with providing clean water, electricity and essential medical equipment and supplies as standardized for commune level health facilities; (f) market places: support construction of housing structures only and initial site clearance of less than 5,000 m²; (g) community houses for villages of 50 households or more; and (h) centralized water supply systems.

Investment projects in villages of communes in Region II are targeted at: (a) transport networks connecting villages with commune centres; (b) small irrigation systems – construction of culverts, dams, pumping stations, canals and structures on canals within the village and other irrigation schemes costing less than VND 500 million; (c) commune to village electricity supply systems; (d) construction of primary and nursery school classrooms, kindergartens and accommodation for teachers together with provision of benches, desks, clean water and electricity; (e) community houses in villages of 50 households or more; and (f) centralized water supply systems.

Training and capacity building projects for commune, village and community officials

The target beneficiaries of these projects are: (a) civil servants and full-time/part-time officials at the commune level and part-time officials at the village level as specified in the Government's Decree No. 121/2003/NĐ-CP dated 21/10/2003 on entitlements and policies for civil servants and officials in communes, wards and towns; (b) officials assigned by higher levels to assist communes; (c) members of the PMU and Commune Supervisory Board; (d) persons of repute in villages; (e) advanced producers actively involved in poverty reduction and rural development activities in communes and villages; (f) potential officials included in the commune plan for future leadership development; (g) legal aid co-operators

and members of legal aid clubs at the commune level; (h) ethnic minority youth aged between 16 and 25. Priority is given to ethnic minority officials and women cadres among the above target beneficiaries.

Support policy for services, improvement of living standards and legal aid to raise legal awareness

The beneficiaries of these policies are poor households in P135 (selected by community). The types of support include: education support for children of poor households (VND 70,000 per student in nurseries; VND 140,000 per student in primary schools); legal awareness for villages (VND 2 million per year per commune); living environment: (VND 1 million per household); construction of animal barns (away from house); construction and improvement of toilets; and package support for social and communication activities of village (VND 2 million per village).

National Poverty Targeted Programme (2006-2010) (P20 – Issued by Decision No. 20 of Prime Ministers)

Objectives (at year 2010)

The targets are to decrease poor households from 22 per cent in 2005 to 10-11 per cent. This means that in five years the number of poor households will decrease by 50 per cent. The income of poor households will increase 1.45 times over 2005 levels. About 50 per cent of island and coastal communes will see significant improvements.

Beneficiaries

The targets of the 2006-2010 programme are poor people, poor households, poor communes and extremely difficult communes. Priority is given to poor households having a female head, ethnic minorities and poor households having social support person (disabled, special status children).

Outcomes

The outcomes of the programme include:

- a) basic infrastructure will be built in extremely difficult communes in coastal sandy communes, island communes;
- b) about six million poor households will get credit loans;
- c) extension services for 4.2 million poor persons;
- d) reduction, free tuition for job training for 150,000 poor labourers;
- e) 100 per cent of poor persons given health care insurance cards;

- f) free tuition for 19 million poor pupils including 9 million primary pupils;
- g) training for 170,000 staff involved in poverty reduction activities, of which 95 per cent are local staff;
- h) support to substitute cottages of 500,000 poor households; and
- i) free legal services for 98 per cent of poor persons upon demand.

Project and policy implementation of the programme

Groups of policies, projects to support production, income generation

These include: preferential credit policy to the poor; projects on agricultural land for poor ethnic minorities; projects on extension services and production support; projects on basic infrastructure for extremely difficult communes in sandy coastal areas; job training projects for the poor; and poverty reduction model expansion projects.

Group of policies, projects to support the poor to have access to social services

These include: policy on health care services to the poor; policy on education support to the poor; policy on housing construction and water supply support to the poor; and policy on legal services support to the poor.

Group of projects for capacity building

These include: the project on capacity building for poverty reduction activities (TOT, mass media); and monitoring and evaluation.

Sources of funding

The total funding available is VND 43,488 billion and it comprises:

- a) Central budget: VND 12,472 billion (28.7 per cent)
- b) Local budget: VND 2,260 billion (5.2 per cent)
- c) Community contribution: VND 2,460 billion (5.7 per cent)
- d) International funding: VND 296 billion (0.68 per cent)
- e) Credit: 26,000 VND billion (59.79 per cent)
- f) Direct targeted fund: VND 3,456 billion
- g) Fund co-ordinated from other remaining projects: VND 40,032 billion

Outline of JIRCAS and its Commitment to Rural Poverty Alleviation*

*Tomohide Sugino***

Introduction

The purpose of this paper is to introduce the current activities of the Japan International Research Center for Agricultural Sciences (JIRCAS) and how its activities contribute to rural poverty alleviation. Since its establishment, JIRCAS has carried out a number of research activities in the developing regions concerning agriculture, forestry, fisheries and environmental issues. Though its academic achievement has been appreciated by the collaborating countries and academic communities, there is still much room for improvement in its contribution to poverty alleviation. In the following part of the paper, the outline of JIRCAS's activity and its commitment to poverty alleviation is described. Then, the future direction of its R&D focus is discussed.

Outline of JIRCAS

JIRCAS was established in October 1993, through the reorganization of its predecessor, the Tropical Agriculture Research Center (TARC). TARC was established in 1970 and its major mission was development of techniques necessary for agricultural promotion in developing countries. In order to expand its scope of work and enable it to conduct a comprehensive approach to solving food and environmental problems in developing regions, TARC was reorganized into JIRCAS.

JIRCAS is the sole national institute in Japan that undertakes comprehensive research on agriculture, forestry and fisheries technology in developing regions. The study areas include not only tropical and subtropical regions, but also temperate zones such as Central Asia and Mongolia. The major objective of the activities is providing solutions to

* Paper presented at the Regional Meeting, "Towards a Joint Regional Agenda for the Alleviation of Poverty through Agriculture and Secondary Crop Development", UNESCAP-CAPSA, Bangkok, 21-22 November, 2007.

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international food supply and environmental problems through technology development. Besides technology development, it also collects, analyses and publishes information to grasp trends relevant to international agriculture, forestry and fisheries as well as farming systems.

Though the most of R&D activities of JIRCAS are classified into Official Development Assistance (ODA), the basic concept of its international collaboration has been equal partnership and mutual benefits. While JIRCAS provides most of the research budget and sends its personnel to project areas, the partner institutes also contribute to the project via means such as providing counterpart researchers, office space and various support which is necessary for the research implementation. To formulate the projects, JIRCAS holds an intensive discussion with partners to identify the study subjects that will provide benefit to the collaborating countries and contribute to rural development through technological innovation.

JIRCAS tries to achieve its objectives through four major activities, namely, 1) international collaborative research; 2) dispatch and invitation of researchers; 3) research planning and evaluation; and 4) co-operation with developing regions.

The current main research areas of JIRCAS are as follows.

1. Genetic research geared towards maintaining crop productivity despite adverse environments of drought, salinity and freezing.
2. Research on biomass utilization technology which converts plant or agricultural residues into useful energy resource alternatives to fossil oil.
3. Research on sustainable agricultural, forestry and fisheries technology suitable for restricted space on island environments threatened by population pressure in the tropics and the subtropics.
4. Research aimed at contributing to the development of stable farming villages in Asia, where 50 per cent of the global population lives.
5. Research on environmentally friendly agricultural farming systems for food security in Africa, which lags behind in global development.

JIRCAS implements its activities according to a five-year mid-term plan. Under the current mid-term plan (2006-2010), the main focuses are the four programmes below. Under these programmes, 33 R&D projects are carried out (See Annex).

- 1-1 Developing technologies to utilize biological resources for stable production and multi-purpose application, under adverse environments.

- 1-2 Developing technologies of environmental resources management and production-system management to sustain agriculture, forestry and fisheries.
- 1-3 Resolving global impacts of environmental changes on agriculture, forestry and fisheries and developing remedial technologies.
- 2 Clarification of the direction of technology development in developing regions and analysis of socio-economic conditions of development in rural areas.

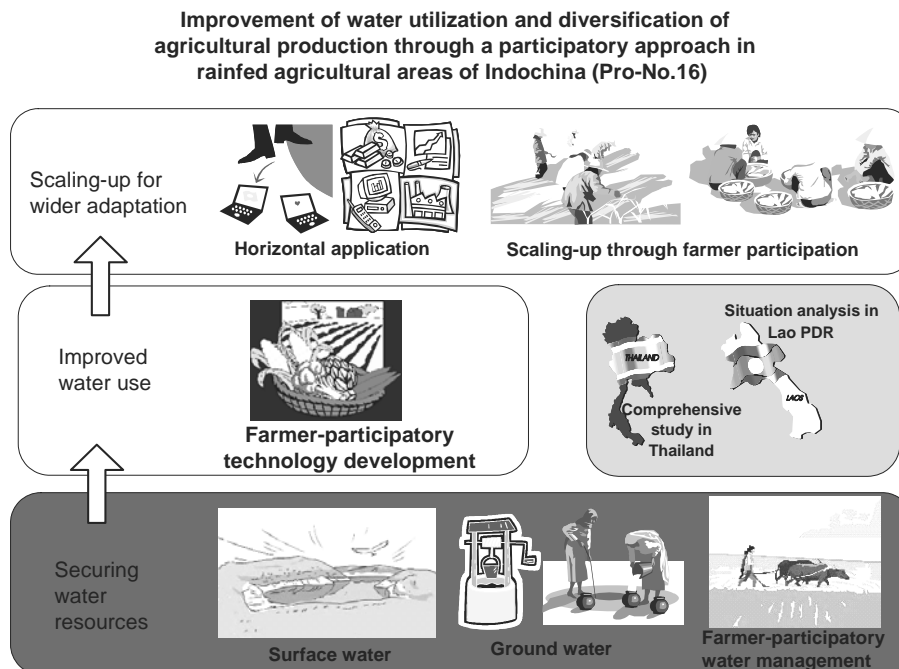
Considering its mission (to contribute globally to address issues on agriculture, forestry and fisheries in developing countries through research activities), each project focuses on specific issues that are the crucial constraints for the development of rural societies. If some projects aim to develop new technologies to solve the technological constraints in the agricultural production system in the region, it is recommended to consider how the developed technologies effectively adopted by the farmers, thus contribute to poverty alleviation through improved productivities. The outlines of the selected ongoing projects are introduced as below.

(1) Improvement of water utilization and diversification of agricultural production through a participatory approach in rainfed agricultural areas of Indochina (Rainfed Agriculture)

Rainfed agriculture refers to farms that depend primarily on rainfall. Due to the stagnation of the irrigation facility construction these days, they are becoming widespread all over the world and the technology development which can be applicable in these areas is increasing its importance. For rainfed farms in the Indochina peninsula, technology for improved water use is crucial towards achieving stable agricultural production and income.

This requires a watershed-based approach that utilizes rainfall, shallow ground water and small-scale ponds. This project seeks to analyse traditional cropping methods and water-saving mechanisms using a farmer-participatory approach, in order to identify suitable water collection and distribution technologies with appropriate crop selection techniques. It also aims to realize increased farm diversification and higher incomes in the region. The project is implemented in Thailand and Lao People's Democratic Republic (Figure 1).

Figure 1. Outline of the Rainfed Agriculture project



Source: Courtesy by Osamu Ito, modified by author.

(2) Impact Analyses of Economic Integration on Agriculture and Policy Proposals toward Poverty Alleviation in Rural East Asia (ECOIN)

East Asia has attained high degrees of food self-sufficiency and economic growth. However, through such process, income inequalities have expanded within rural areas and between urban and rural areas. It has become increasingly important to alleviate rural poverty by various means including increasing agricultural income and creating rural jobs.

It is frequently commented that recent and rapid integration of East Asian economy will provide both good opportunities of reducing poverty and also negative effects. In fact, even some lately developing countries and areas such as Cambodia, Lao People's Democratic Republic and inland China are expanding their opportunities to export their agricultural products to advanced developing countries and international markets on the process of trade liberalization and transportation network development in the region. The liberalization of capital movements has also enhanced the investment of international food processing and supermarket companies to such developing countries, which promoted the production of high-value agricultural commodities and created rural jobs. The shift toward

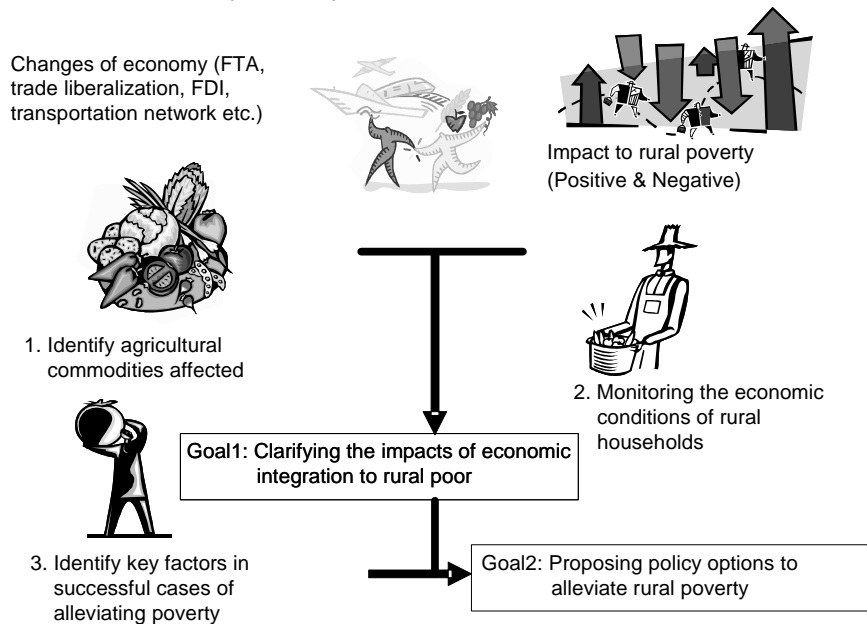
such high-value agriculture will result in a deeper integration between firm and farm sectors and will enable the structural change of traditional agriculture.

Attention should also be paid to realities that economic integration does not always provide positive effects for every region and social class. It has been more often said that, especially in the marginal areas where crop diversification and market access are difficult due to insufficient infrastructure, that economic integration has worsened poverty and even reproduced poverty due to fewer of educational opportunities

The project aims at clarifying the impacts of economic integration on East Asian agriculture, especially on diversified and high-value agriculture, and diversified income resources and employment opportunities through farming-marketing integration, thereby proposing ways to take advantage of economic integration for poverty reduction and to minimize negative influences. The project focuses not only on the impacts of economic integration but also on the measures for supporting the poor. The results of the study will be provided to policymakers for poverty alleviation. The project is implemented in Cambodia, China, Indonesia, Lao People's Democratic Republic, Malaysia, Thailand and Viet Nam (Figure 2).

Figure 2. Outline of the ECOIN project

Framework of ECOIN (Pro-No.33)



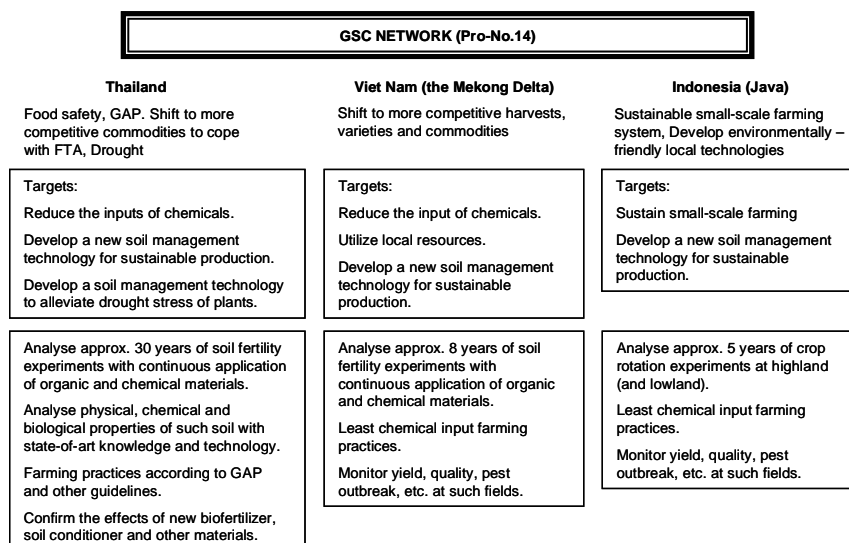
Source: By author

(3) Good Soil Care (GSC) in the tropics

In Southeast Asia, high-chemical input farming practice has resulted in yield stagnation in some crops, environmental degradation and more concerns for food safety and good agricultural practice. Therefore, agriculture in the region has gradually shifted to less-chemical input farming and safety-oriented production. Such shift necessitates more research on sustainable soil management with less dependence on chemical input.

The GSC Project aims to develop a model to evaluate resource inputs and environmental burden baselines, while conducting sustained measurements of the physical, chemical and biological properties of soil to illustrate the results of continuous application of organic matters and other practices (green manure/cover/crops, microorganisms, minimum tillage, etc.) in tropical agricultural land. The project tries to contribute to the welfare of rural small-scale farmers by improved soil productivities. The project is implemented in Indonesia, Thailand and Viet Nam (Figure 3).

Figure 3. Outline of the GSC project



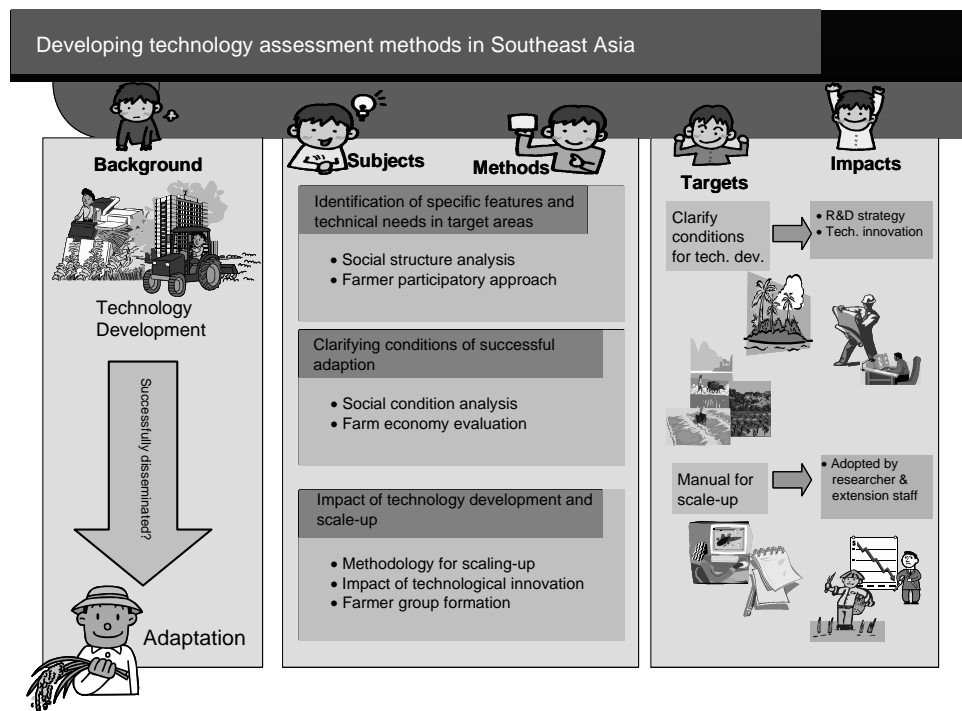
Source: Courtesy of Satoru Miyata, modified by author.

(4) Developing technology assessment methods in Southeast Asia (Technology Assessment)

To minimize the gap between agricultural technology developed by advanced institutions and those of farm level diffusion and adaptation, this project will develop a technology assessment and monitoring tool and conduct *ex ante* assessment and

comparative analysis on local farm management through participatory research. Influences and impacts of technology diffusion will be examined to develop a method of scaling-up. And socio-economic impacts of technology in rural society and interrelationships between individual farms and the community will be evaluated. The output of the project will be used by research managers and policy planners to formulate technology development plans that have wider impacts and stronger effects on rural poverty alleviation. The project is implemented in Cambodia, Indonesia, Lao People's Democratic Republic, Philippines and Thailand (Figure 4).

Figure 4. Outline of the technology assessment project



Source: Courtesy of Kumi Yasunobu, modified by author

JIRCAS's commitment to rural poverty alleviation

If we can distinguish four ways of poverty alleviation in rural areas as indicated below, which were proposed by UNESCAP-CAPSA in the conceptual framework of the Regional Meeting (21-22 November 2007, in Bangkok), the activities implemented by JIRCAS will be classified into categories 2 and 3.

1. Transferring cash to the poor
2. Increasing farm and labour productivity and income in agriculture
3. Including the local rural and agriculture economies in a wider process of economic growth
4. Reducing costs and increasing prices through subsidies.

Out of 33 projects implemented under the current mid-term plan, 31 projects belong to the programme 1-1, 1-2 and 1-3 (As indicated at the beginning of section 2), which are mainly focusing on technology development and its application to local farming systems. They will contribute to poverty alleviation through the improvement of productivities. The other two projects belong to programme 2, which aims to identify socio-economic problems in the target areas and then provide practical information to the policymakers in the region for their pro-poor policy formulation process.

To consider how JIRCAS can realize its commitment to poverty alleviation, it is useful to note several recent aspects of international agricultural research. First, the issue of 'scaling up' has become a major concern of research institutes. The basic concept of scaling up is that agricultural research should produce "more benefit and more equity to more people, more quickly and be more long-lasting" (IIRR, 2000). Based on this concept, donors and other stakeholders are not only expecting increased impacts but they are also emphasizing the quality of such impacts, especially sustainability and equity (Menter *et al.*, 2004).

After the economic depression in the 1990s, taxpayers in Japanese society, who are the major donors for Japanese ODA, have keener eyes on the efficiency and effectiveness of ODA. In 2003, the Government of Japan established its new ODA policies to intensify all efforts to deepen the relationship between Japan and developing countries. It is important for all the agencies to show the fact that their technological co-operation has successfully contributed to the development of the target countries.

Another trend to which attention should be paid will be the sharp decline of the public investment in rural development and agricultural R&D and increasing private investment into these areas. Private sector investment in agricultural research now exceeds the combined total investments of all the public sector research institutes in the world (Byerlee and Fischer, 2001).

As for JIRCAS, it is obliged to cut the research budget by 1 per cent and management cost by 3 per cent annually according to its Second Medium Term Plan. Therefore, it is encouraged to find an alternative resource other than governmental support.

However, most of the research funds in Japan focus on the development of state of the art technologies that are beneficial to domestic industrial development. It is not an easy task for JIRCAS to find a resource that expands R&D activities to contribute to poverty alleviation and rural development in developing countries.

If a shrinking budget is inevitable, the possible strategy will be the 'concentration, co-ordination and confidence' approach. Concentration means JIRCAS should concentrate its effort into the fields where it has better advantages and where public institutes like JIRCAS are expected to do. As is described by Anderson (2007), 'new pro-poor' research priorities (research subjects focusing on less-favoured areas and small-scale farmers) should be the major target of JIRCAS's R&D programmes.

Co-ordination means strengthened partnerships with collaborating organizations. For the effective use of limited resource, the collaborative works with National Agricultural Research Systems (NARS) both in developing and industrialized countries, international research systems like the Consultative Group on International Agricultural Research (CGIAR) is important. In this context, it is remarkable that JIRCAS provided its first contribution to UNESCAP for its collaborative research project in 2007. This reveals its intent to strengthen effort to contribute to the MDGs, especially the target of halving extreme poverty by 2015.

Confidence will be formulated if the farmers, the ultimate beneficiaries of the technological development can receive the fruit of newly developed technologies. To achieve farmers' confidence, JIRCAS should promote more active participation by farmers into its R&D process. The policy planners in the developing countries is another user of the R&D output, especially the information and recommendations formulated by the findings of the project. It is necessary to increase the effort to translate the findings into a clear and easy-to-understand format, which can be used by policy planners on their planning process of rural development.

Conclusions

During the discussion about the current mid-term plan, JIRCAS has shown three overall goals of its international collaborative research areas, namely, 1) sustainable development, 2) poverty alleviation and 3) science and technology improvement (JIRCAS, 2005). Considering the shrinking public allocation to agricultural R&D, the collaborative studies by JIRCAS should be results based and focus more on international development goals typified by MDGs. To achieve these goals, further effort will be useful for three "Cs",

namely, concentration on the prioritized subjects, co-ordination with the partners and confidence by the recipients and donors.

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Annex:**Ongoing projects by JIRCAS (as of FY 2007)**

	Project title
1	Development of abiotic stress-tolerant crops
2	Elucidation of molecular mechanisms of abiotic stress tolerance and improvement of stress tolerance in model plants
3	Improvement of drought and submergence tolerance of rice in Africa
4	Blast research network for stable rice production
5	Identification of stable resistance to soybean rust in South America
6	Development of technologies to utilize biomass resources in Southeast Asia
7	Value-addition to traditional agricultural products of Asia
8	Development of the stress-tolerant <i>Vigna</i> legumes in tropical and subtropical regions
9	Development of breeding materials to diversify sugar cane utilization
10	Technology to control reproduction in commercially important shrimp and prawn species
11	Research for suitable stock management in tropical/subtropical areas
12	Development of aquaculture technology suitable for Southeast Asia
13	Improvement of the fertility of sandy soils in the semi-arid zones of West Africa through organic matter management
14	Good Soil Care (GSC) in the tropics
15	Development of integrated rice cultivation system for reduced water availability
16	Improvement of water utilization and diversification of agricultural production through a participatory approach in rainfed agricultural areas of Indochina
17	Development of a sustainable agro-pastoral system in dry areas of Northeast Asia
18	Technical development for monitoring soil water and crop growth under drought stress in West Asia and North Africa
19	Establishment of a feeding standard for beef cattle and a feed database for the Indochinese peninsula
20	Verification of the effectiveness of the agro-pastoral system and development of supplemental feed
21	Production of <i>Brachiaria</i> forage grasses with improved quality and drought tolerance for efficient beef production in the tropics
22	Characterization and exploitation of Biological Nitrification Inhibition (BNI)
23	Development of environmental management technology for sustainable crop production in tropical and subtropical islands
24	Improvement of selective logging techniques for the conservation of biodiversity in the hill dipterocarp forests of Peninsular Malaysia
25	Development of techniques for nurturing beneficial indigenous tree species and combined

management of agriculture and forestry in Northeast Thailand's tropical monsoon regions

Project title	
26	Development of techniques for low tree height-cultivation and year-round production of tropical fruits such as durian, mangosteen, etc., in Southeast Asia
27	Stable food supply systems for mitigating the fluctuations in production and markets in China
28	Water supply fluctuations in Indochina
29	Enhancement of GIS applications for agricultural land information at local to regional scales
30	Development of management techniques for Citrus Greening disease in severely affected areas
31	Development of biological control against invasive insect pests on coconut trees
32	Developing technology assessment methods to determine factors that influence technology diffusion in Southeast Asia
33	Impact analyses of economic integration on agriculture and policy formulation towards alleviation of rural poverty in East Asia

Source: Author.

Note: Projects Nos. 1-12 are implemented under programme 1-1, Nos. 13-26 are under programme 1-2, Nos. 27-31 are under programme 1-3 and Nos. 32-33 are under programme 2.

Appendices

Appendix 1. Programme

Wednesday, 21 November 2007

08:00-09:00	Registration	
09:00-09.35	Opening session:	<ul style="list-style-type: none"> • Welcome, Dr. I Wayan Rusastra, Programme Leader R&D, CAPSA • Key note address, Dr. J.W. Taco Bottema, Head, CAPSA • Programme overview, Mr. Geoff Thompson, Associate Information and Communication Officer, CAPSA
09.35-09.45	Introductions – meeting participants	
09:45-10:15	Break	
10:15-10:30	Official statements (optional) from country representatives	
	<i>Country status presentations – Group A</i>	
10:30-11:00	Bangladesh	Dr. Md. Ismail Hossain Member Director, Agricultural Economics and Rural Sociology, Bangladesh Agric. Research Council
11:00-11:30	China	Dr. Fu Qin Professor & Director General, Institute of Agricultural Economics and Development Chinese Academy of Agricultural Sciences (CAAS)
11:30-12:00	India	Dr. PK Joshi Director, National Centre for Agricultural Economics and Policy Research, India
12:00-12:30	Group A question and discussion session	
12:30-13:30	Lunch	
13:30-14:00	Collection of DSA	
	<i>Country status presentations – Group B</i>	
14:00-14:30	Indonesia	Dr. Tahlim Sudaryanto Director, Indonesian Center for Agro Socio-Economic Policies and Studies (ICASEPS)
14:30-15:00	Rep. of Korea	Dr. Woon-Goo Deputy Director, International Technical Cooperation Center (ITCC), Rural Development Administration (RDA)
15:00-15:30	Myanmar	Mr. U San Nyunt General Manager, Myanmar Agriculture Service Ministry of Agriculture and Irrigation
15:30-16.00	Break	
16.00-16.30	Group B question and discussion session	
	<i>International organizations' presentations</i>	
16:30-17:10	APAARI	Pijush K. Saha Liaison Officer, Asia-Pacific Association of Agricultural Research Institutions

	JIRCAS	Mr. Tomohide Sugino Research Scientist, Japan International Research Center for Agricultural Sciences
	CIRAD	Dr. Jacques Marzin
	UNESCAP-CAPSA	Dr. I Wayan Rusastra
17.10	Close	

Thursday, 22 November 2007

	<i>Country status presentations – Group C</i>	
08:00-08:30	Nepal	Dr. Nanda Prasad Shrestha Executive Director, Nepal Agricultural Research Council (NARC)
08:30-09:00	Pakistan	Dr. Syed Ghazanfar Abbas TSO to Chairman, Chairman of Secretariat Pakistan Agricultural Research Centre
09:00-09:30	Philippines	Mr. Nicomedes P. Eleazar Director, Bureau of Agricultural Research Research and Development Management Information Center, Bureau of Agricultural Research
09:30-10:00	Group C question and discussion session	
10:00-10:30	Break	
	<i>Country status presentations – Group D</i>	
10:30-11:00	Papua New Guinea	Dr. RD Ghodake Director General, National Agricultural Research Institute
11:00-11:30	Sri Lanka	Mr. JATP Gunawardena Director, Socio-Economics and Planning Centre Department of Agriculture
11:30-12:00	Thailand	Ms. Ratchanee Wongchantrakarn Senior Policy and Plan Analyst, Office of Agricultural Economics (OAE), Ministry of Agriculture and Cooperatives
12:00-12:30	Viet Nam	Mr. Nguyen Van Nghiem Head, Cooperative and Farms Division, Ministry of Agriculture and Rural Development, Department of Cooperative and Rural Development
12:30-13:30	Lunch	
13:30-14:00	Group D question and discussion session	
	<i>General discussion to develop items for joint regional agenda</i>	
14:00-15:00	Discussion session on key points for joint regional agenda	
15:00-15:30	Break	
15:30-16:30	Towards conclusions on key points for joint regional agenda	
16:30	Close	

Appendix 2. List of Participants

		Name/Title/Address
A. PARTICIPANTS		
1.	Bangladesh	Dr. Md. Ismail Hossain Member Director Agricultural Economics and Rural Sociology (AERS) Bangladesh Agricultural Research Council (BARC) New Airport Road, Farm Gate, Dhaka 1215 Bangladesh Phone: (88-02) 9119906 (O) (88-02) 9257007 (R) Mobile: 0088-01711-243636 Fax: (88-02) 8113032 Email: mdismail53@yahoo.com
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Appendix 3. Guidelines for Contributions to CAPSA's Regional Meeting

Distributed to workshop participants in September 2007.

The following remarks are intended as guidelines for contributions to the Regional Meeting. We expect contributions from three different sources:

1. our partners and focal institutes in member countries
2. thematic papers on invitation
3. papers by international organizations

Those familiar with agriculture and rural development know that there has been a very well developed set of international and regional networks connecting national and international centres of excellence. However since the formulation of the Millennium Development Goals and a general softening of the profile of agriculture during the 1990s, public support and participation in these established networks have eroded. At the same time there is now continuous pressure to re-invent the role of agriculture in the alleviation of poverty.

Until recently, most researchers and development agriculturalists assumed that any work resulting in improved technology, improved productivity and improved farm income would automatically result in the alleviation of poverty. However, if we take the alleviation of poverty to be the main goal of our development activities in agriculture, it would mean that we would target those people making a living from agriculture at a level below the poverty line. In this case we would focus on a group of agriculturalists with a low absorption capacity, limited scope for innovation, and limited access to credit and markets. Such a focus would limit the chances for success of the strategy, unless there was public allocation on a massive scale to improve agriculture. Unfortunately, the contrary has been the case: until recently public allocations to agriculture have decreased consistently throughout the region. It is also becoming quite clear that in the Asia and the Pacific regions, poverty is centred in rural areas, with 70 per cent of the region's poor being dependent on agriculture or related services. For these reasons, among others, attention to rural development appears to be gaining momentum in a number of countries, China and India, for example.

We can distinguish four ways of alleviating poverty in rural areas:

1. transferring cash to the poor
2. increasing farm and labour productivity and income in agriculture
3. including the local rural and agriculture economies in a wider process of economic growth (Timmer 2007)
4. reducing costs and increasing prices through subsidies.

These four ways of alleviating poverty do not exclude one another. In preparing contributions however, we would like to suggest, that projects, programmes and other activities are grouped in these four categories of impact channels.

We should also acknowledge that the task of alleviating poverty in rural areas is not only undertaken by the ministries of agriculture and their various departments, but also by other ministries, local government as well as the private sector and NGOs.

Important, even vital, issues such as resource management would on first sight not have a place in the poverty alleviation framework. However, because it creates the conditions for improvement of productivity resource management should not be omitted.

If available, case-based information on programme and project modalities is most welcome. Finally, any thought or observation on the agenda on agriculture and poverty alleviation is most welcome and necessary.

Appendix 4. Key Points for Discussion Session

Re: Poverty Alleviation

- A. Mainstream: Multi-sectoral community & area development programmes.
Community targeted (grants, infrastructure, services)
- B. Specific targeted programmes:
 - insurance schemes (life, death, crops);
 - gender schemes;
 - credit schemes;
 - irrigation schemes.
 - employment schemes;
 - direct cash transfers;
 - market linkage
- C. Subsidies:
 - Energy subsidies;
 - Food subsidies;
 - Price support;
 - Seed support;
 - Fertilizer support

Observations:

- A. Place of agriculture is small but most programmes touch/influence agriculture.
- B. Plethora of policies and programmes. Some (energy & food) are very expensive.
- C. Agri GDP decreases over time.
- D. In all developing countries poverty is concentrated in rural areas, especially in rainfed, dry and isolated areas. Dependence of the poor on agriculture and secondary crops varies between 60-95 per cent.

Key Problems:

1. What happens to excess labour – can it be absorbed in other sectors? – answer: only partly.
2. Increasing income gap urban – rural.

3. How to include people in isolated and marginal areas.
4. Risk is high for poor people.

Questions:

- Upscaling? Seems a problem with agriculture focused projects but less so with broader area community targeted welfare projects.
- Can we find 'cluster multipliers': e.g. combinations of interventions which strengthen one another for example, roads plus R&D? or agriculture plus education?
- Long-term causes of poverty? Characteristics?
- Do we know the effect of the various policies?
- We should define poverty in a dynamic way – i.e. 50 per cent less than upper 50 per cent median.
- Contract farming, small farmers market linkage: there is a need to consider risk sharing – to ensure farmers are not exploited.
- Price fluctuations and behaviour under increasing globalization and cross border trade.
- Do we need a generic approach for development in isolated and sometimes conflict prone areas?

Prospects:

- G M O
- Bioenergy
- Post-harvest/value adding activities
- Diversification
- Others