

# **THE PADDY PARADOX: CHALLENGES IN THE NEXT DECADE**

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## **Abstract**

When the previous Rice Symposia were held, the objectives of agricultural policy were clearer. The maximization of rice output and the attainment of self-sufficiency in rice were unequivocal objectives. Today, there is some confusion about the country's rice situation and the directions which rice farming should take in the future. The situation is more complex than ever before owing to; changes in rice farming itself, the structural changes in the economy and the societal transformations that are taking place, the economic stresses and constraints, and the global economic context within which we must achieve our goals and the changing development paradigms of the day. It is these reasons that have impelled me to title my paper "The Paddy Paradox: Challenges in the Next Decade."

The paper focuses on the contextual and broader overall situation within which the discussions at the Rice Symposium must take place, the directions that our rice policies must take and the enormous challenges we would have to face and the inherent difficulties which we have to resolve. The issues in rice cultivation have to be discussed within these broader changes that are taking place at present. The paper places the developments in rice in a historical perspective. It then outlines the current situation and flags the key issues facing paddy farming and discusses the most critical issues in some detail. It then poses the challenges for the rice economy in the next decade.

Fifty years ago, we had a population of a little more than 7 million, and imported more than 50 percent of our requirement of rice and a large amount of other agricultural produce like poultry and eggs, onions, potatoes, chillies and other subsidiary food stuffs. Today, with a population of over 20 times, we import only a small volume of rice and produce a good proportion of our other food requirements. This is no mean achievement. Yet, there are reasons for concern.

First of all the greater measure of self-sufficiency we have achieved in rice has been partly owing to the greater importation of wheat and an increasing trend of wheat flour consumption. Over time there has been a substitution of wheat flour for rice and rice consumption per capita has declined from around 113 kilograms in the 1980s to about 95 kilograms today. The fluctuations in per capita consumption of these two main cereals have been owing to their relative price differences. The increasing trend in wheat flour consumption is also due to a preference for wheat flour products owing to convenience and changing life styles. Rice production and yields during the last fifty years show an impressive performance till the 1970s, after which production increases and yield improvements have been tardy. The 1990s were particularly disappointing as production increased by only 13 per cent. In the 1990s production as well as yields reached a plateau till 1995. It has increased somewhat since then, particularly in the last four years. Yet the increase in production in 1999 was only 2 per cent higher compared to that of 1995. However, there was an increase in rice production by 6.5 per cent in 1999. Rice production declined by 10 per cent in 2000. These facts may not accord with the general impressions about rice production, which is that we are more than self-sufficient in rice owing to sharp increases in rice production. The reason for this impression is the collapse of the rice market with rice farmers having to sell their rice at prices below their cost of production. The underlying reason for this is that imports have increased along with local production increases. In 1998 we produced 2692 metric tons of paddy and imported 168 thousand metric tons of rice. In 1999 we increased our imports of rice to 214 thousand metric tons when our paddy production increased.

to 2868 thousand metric tons. Consequently the availability of rice increased and the situation worsened when this year's *maha* harvest, in particular, was good.

It is in this context that the current issues in rice production must be discussed. The main challenges facing the rice economy are given below. The first challenge we face is to develop a framework of overall economic and agricultural policies that have clearly stated objectives and are consistent. These policies would include import and pricing policies for cereals, the pricing of inputs and the question of direct or indirect subsidies for inputs, the issue of a guaranteed or floor price for paddy and the mechanisms to make these effective. In brief, there is a need for a clearly articulated macro economic policy framework for rice for the next decade.

A closely related issue is the viability of rice farming. Farmers are faced with a very serious cost-price squeeze. There is clear evidence that the majority of rice farmers are finding rice cultivation uneconomic in the sense that incomes derived are inadequate for their basic living. This is resulting in an increasing trend of rice farming becoming a part time occupation. This has both positive and negative impacts. This issue has to be examined objectively and its implications faced squarely. While Sri Lanka's rice yields are relatively high compared to other rice growing countries with similar agronomic conditions, there is a large gap between the potential yields and the realised yields. The bridging of this gap would mitigate several of the problems faced by the country's rice farmers and the economy. There are agronomic, technological, institutional and economic issues to be resolved to reduce the yield gap. This is a foremost issue for rice scientists, economists, extension specialists and agricultural economists.

The strengthening of the institutional framework serving rice farming is of utmost importance. New and more cost effective mechanisms would have to be developed to ensure that rice farmers have access to credit, research findings, seed material, fertilizer and other inputs. Above all, the marketing mechanisms for paddy have to be strengthened to ensure that the market margins between the farm gate price and the consumer price are reasonable. These do not exhaust all the challenges facing the rice economy, but they are in my view among the most important. The resolution of these issues requires research, objective examination of the issues and fresh thinking unbridled by past paradigms.

## INTRODUCTION

When the previous Rice Symposia were held, the objectives of agricultural policy were clearer. The maximization of rice output and the attainment of self-sufficiency in rice were unequivocal objectives. We meet today in a situation when there is some confusion about the country's rice situation and the directions that rice farming should take in the future. The situation is more complex than ever before owing to changes in rice farming itself; the structural changes in the economy; the social transformations that are taking place; the economic stresses and

constraints we face; the global economic context within which we must achieve our goals and the changing development paradigms. It is these reasons that have impelled me to choose as the theme of my presentation the challenges facing the rice economy in the next decade.

I do not intend to cover all the manifold challenges facing the rice economy. The best rice scientists have been mobilised for this symposium. Their detailed analysis will deal with the scientific, economic and institutional factors bearing on the cultivation of rice. My task is different. I have interpreted it

to be one of focussing your minds on the contextual and broader overall situation within which the discussions must take place, the directions which our rice policies must take, the enormous challenges we would have to face and the inherent difficulties which we have to resolve.

We cannot discuss the issues in rice cultivation without the broader changes that are taking place in our economy: we cannot resolve the policy issues in rice without reference to the global changes that are occurring; we cannot discuss the most crucial issues facing the rice economy without recognising significant social transformations and changes in values that are occurring in our own society. We have to place the rice economy within a context of rapid changes in our society and the structural changes that are occurring in the economy. I will try to do that - a difficult but a necessary task.

I will first place the developments in rice production in a historical perspective - a mere historical glance. I will then outline the current situation and flag the key issues facing rice farming. I will then discuss the most critical issues in some detail and conclude by posing the fundamental challenges facing rice farming in the next decade.

### A RETROSPECTIVE GLANCE

Fifty years ago, we had a population of a little more than 7 million. Today we have a population of about 19 million.

In 1950 we imported more than 50 per cent of our requirements of rice and a large amount of other agricultural produce like poultry and eggs, onions, potatoes, chilies and other subsidiary food stuffs. Today, with a population of about 2 1/2 times more, we import only a small volume of rice and we produce a good proportion of other food stuffs. This has not been a mean achievement. Yet when we look at these developments more closely, there are reasons for concern.

First, the greater measure of self-sufficiency we have achieved in rice has been partly owing to the larger imports of wheat and an increasing trend of wheat flour consumption. In the 1950s our per capita wheat flour consumption was only about 20 kilograms. Today our wheat consumption is about 50 kilograms per capita - an increase of per capita wheat consumption by 2 1/2 times. Over time there has been a substitution of wheat flour for rice. Rice consumption per capita has declined from around 107 kilograms in the 1960s to about 95 kilograms today. Within an increasing trend in wheat flour consumption, there have been fluctuations in per capita consumption of these two main cereals owing to changes in their relative price differences.

The increasing trend in wheat flour consumption is also due to a preference for wheat flour products. This shift in consumption from rice to wheat flour has occurred internationally as well. There are three basic reasons for this shift in Sri Lanka and other rice consuming countries. These are: The desire for a

varied diet in which wheat flour is not only consumed as a staple but also for other food preparations such as cakes and pastries. The convenience of wheat flour preparations owing to changing life styles. The trend of declining wheat prices in the international market.

Let us turn to look at what has happened to rice production and yields during the last fifty years. In the 1950s rice production increased by 65 per cent owing to both an expansion of area cultivated by 25 per cent and an increase in yields by 40 per cent. The 1960s saw a similar achievement. Rice production increased by over 50 per cent mainly owing to a sharp increase in productivity due to the introduction of high yielding varieties. Rice yields increased by 41 per cent from 1.89 tons per hectare in 1960 to 2.68 tons per hectare in 1970. The yield increase was slower in the 1970s, when it increased by less than 10 per cent. However, rice output increased by nearly 19 per cent owing to an area expansion of over 10 per cent.

The first half of the 1980s saw an expansion in the area cultivated. Production increased by 25 per cent between 1980 and 1985. After 1985 yield improvements were modest, even declined in certain years. Rice production decreased from 2661 thousand metric tons in 1985 to 2063 thousand metric tons by 1989.

The 1990s were particularly disappointing. In the first half of the 1990s production as well as yields reached

a plateau till 1995. It has increased somewhat since then, particularly in the last three years. Between 1995 and 1999 rice production increased by only 2 per cent. In 1999 rice production reached a peak 2868 thousand metric tons. Yet, in the decade as a whole, production increased by only 13 per cent. These facts may surprise those accustomed to think that we have had an enormous upsurge in rice production in recent years.

This impression is due to two reasons. One is that there has been an increase in rice production since the low level of production of 2239 thousand metric tons in 1997. Rice production increased by 6.5 per cent in 1999. Yet production in 1999 was only 2 per cent higher than that of 1995.

The second reason for this impression is the collapse of the rice market. Rice farmers have had to sometimes sell their paddy at below their cost of production at prices as low as Rs.8 per kilogram. The underlying reason for this is that imports increased at the same time as when local production was increasing. In 1998 we produced 2692 thousand metric tons of paddy and imported 168 thousand metric tons of rice, in 1999 we increased our imports of rice to 214 thousand metric tons when our paddy production increased to 2868 thousand metric tons. Consequently the availability of rice increased especially when the 1999 *maha* harvest was particularly good.

Paddy production this year (2000) is well below the requirements for domestic consumption. Paddy production for the year 2000 is estimated at 2787 thousand metric tons, whereas consumption requirements are 3246 thousand metric tons—a short-fall of about 14 per cent. Even in 1999 when we recorded the highest paddy production ever, there was a short-fall of 11 per cent in relation to consumption requirements of that year.

### CURRENT ISSUES

In this context I will confine myself to discussing three of the most important issues currently confronting rice farming. The first is the issue of relatively stagnant yields, second, the issue of viability in rice farming, third, the evolution of rice farming as a part-time occupation. The three issues are very closely inter-related.

The stagnation in rice yields has already been referred to. A further statistic which will clearly demonstrate this is that while rice yields increased by 67 per cent between 1960 to 1980, the increase in yields between 1980 and 2000 was only about 8 per cent. This is a virtual stagnation in yields.

First, Sri Lanka's average yields are not particularly low. In fact our rice yields are higher than that of, India, Pakistan and Bangladesh in South Asia and higher than that of the South East Asian rice producing countries of Thailand, Malaysia and Philippines. Our

yields are, however, lower than those of Japan and Indonesia. Second, average yields mask vast difference in regional yields. Third, the pertinent issue is not so much the comparison in yields among countries, but the gap between the potential yields in the country and the realised yields. It is on this issue of a stagnation in yields well below the potential that we must focus on.

In broad terms, the potential yields of rice are in the region of 10 to 11 metric tons per hectare. The actual yield level is only about 3.7 metric tons per hectare. It is not practical to bridge the yield gap fully as a number of field level constraints have to be faced. However, this yield gap of about 60 per cent is too large. It is indicative of fundamental weaknesses in the agrarian structure and agricultural policies.

If rice farming is to be an economically and socially viable proposition, it is vital that the average national yield be pulled up to about 5 metric tons per hectare within the coming decade. There would of course be regional differences with wet zone average yields being lower and irrigated rice farming in the dry zone having much higher yields.

It is realistic to propose such a rise in yields for two reasons. First, yields higher than 5 metric tons per hectare have already been achieved in some areas, and second, the Department of Agriculture has already demonstrated the feasibility of

raising yield levels to over 5 metric tons per hectare through their Yaya Block Demonstration Project in several areas in the country.

However, the constraints to achieving higher yield levels are many. These include the need to improve soil fertility, proper methods of land preparation, constraints in water availability and its management, wrong cultivation practices, an extension gap which does not link research with field level practices, inadequate credit, bad post-harvest practices and unsatisfactory marketing channels at harvest times which depress farm gate prices for paddy. Most of these issues will be discussed in detail in the papers to be presented at this Symposium.

The Yaya Block Demonstration Project I have already referred to in effect resolves these problems and is therefore able to achieve higher yields. I will present the elements of this project later.

Let me turn to the second issue that I have flagged. The issue of viability of rice farming. This is an issue of very serious concern. There is increasing evidence that rice farming is no longer an economically viable proposition; that rice farming does not provide an adequate income for the farm household.

We must discuss this issue remembering the land tenure and agrarian structure of the country. Over 70 per cent of rice holdings or cultivation units are

below 1 hectare. Twenty five per cent of rice cultivation units are between 1 to 2 hectares. Only about 5 per cent of holdings are above 2 hectares. Therefore, when we discuss the viability of rice farming, we are in effect discussing the viability of paddy farming in units below 1 hectare or much less.

When we put together cost of production data with the paddy price data and yields, we find that there is no way by which a farmer cultivating a hectare of rice and having the average national yield could derive an adequate income for the livelihood of a farm family of about 5 persons. According to the Central Bank's Report on Consumer Finances and Socio Economic Survey of 1996/97, a rural household of five persons required about Rs 9000 per month or Rs 108,000 per year for living expenses 3 years ago. Since 1997 living costs have risen further. This is not an income which a rice farmer could obtain from cultivating only one hectare of rice .

Rice farmers have been caught up in a severe cost: price squeeze. The costs of rice farming have increased, while the sale price of paddy has been depressed in recent years. The estimate of the average cost of production of a kilogram of paddy is Rs. 8.57. The farm gate price has fallen to about Rs. 9-10 recently. Put differently, paddy prices have not gone up commensurately with rises in costs, or even worse, prices have come down. In addition living costs have risen to make rice farm incomes on smallholdings to be totally inadequate. Costs of cultivation

and living expenditure have gone up, yields and prices have not. That is the crux of the issue of viability.

In such a dire context as I have chosen to paint, farm households have three "options" outside of leaving paddy farming altogether. These so-called "options" may in fact not be available to many farmers.

The three options are:

1. Increase yields and thereby their farm incomes
2. Cultivate higher value crops during the off season or the *yala* season
3. Seek off-farm employment and make rice farming a part-time occupation.

The third issue of part time rice farming is an important development that we must comprehend, if we are to design realistic and economically viable policies for raising production and productivity in rice farming. I will now turn to discuss this in some detail.

The evolution of rice farming into a part-time occupation has both a structural rationale as well as push and pull factors. The structural rationale for part-time rice farming was not evident and did not take effect as the push factors out of rice farming and the pull factors from other opportunities were either weak or did not exist at all. These push and pull factors are themselves the product of the

changing nature of the Sri Lankan economy and society.

Let me first deal with the structural rationale for rice farming to be a part-time occupation. This rationale was always inherent in the nature of rice farming and more intensely so especially in small farm rice cultivation.

The structural rationale for part-time rice farming arises due to the distribution of labour use being highly uneven over the cultivation period. Rice farming requires considerable labour inputs during the period of land preparation and sowing at one end, and at harvest time at the end of the season. In between labour use is minimal. During the peak periods of activity, however, household labour inputs may be inadequate especially as the operations have to be performed within a very short period of time. It is because of this that several cultural practices associated with traditional rice cultivation are for the exchange of family labour at peak periods of farm activity, and many of these continue at least in modified forms. The practice of *attam* or mutual exchange of labour is illustrative of this. The fact is that apart from these peak periods of farm activity a good proportion of family labour remains unutilised for many days of the year, if the sole occupation is rice farming. These factors are intensified when the holding is smaller in size. The push and pull factors I discuss are the reasons for this unutilized labour being employed elsewhere.

The push factors consist of the inability of the farm household to make ends meet from their rice farming. This is due to both the cost-price squeeze that I discussed earlier, as well as the increasing costs of living, especially with added needs of a rural family. These added needs would include a more varied diet, expenditure on education of children, more sophisticated tastes in clothing and the consumerism that has gripped even rural society.

Another factor, which is not readily recognized, is that some farming areas have inadequate labour to supplement household labour during the peak periods. A variety of reasons account for this. The full time employment of persons in more remunerative other occupations in or outside the cultivation area, the employment of youth in the army, the exodus of youth to the middle east, are among the reasons for the drift of labour from rural areas and the consequent labour shortage.

There is another very significant sociological factor that underlies this phenomenon. Apart from the economic considerations I have discussed here there is a push out of paddy farming as educated youth, even when unemployed, are averse to working as labourers or cultivating rice themselves. By virtue of their education, even if this be only up to the GCE O level, they deem it a lowly occupation. Contrary to what we may like to say about rice farming being a way of life and our culture being based on rice farming, the stark contemporary reality is otherwise.

The youth of the country do not wish to be employed in rice farming.

There are also pull factors. Some of these pull factors are the converse of the push factors. Illustrative of this is that while rice farming has lost its attraction as an occupation, especially for the educated, other employment opportunities, almost irrespective of the wages, are more attractive. In the context of the low incomes from rice farming that I have referred to, these other occupations are more attractive economically as well as sociologically.

The diversification of the Sri Lankan economy, particularly in the last two decades, has also provided a number of new opportunities for employment. In the past even if some of the push factors were there, they were few opportunities for non-farm employment. The new employment opportunities are indeed varied, they include working in garment factories, retail trade, self employment opportunities like running a three wheeler, working as a driver in school vans and private coaches, small scale manufactures *etc.* The diversified economy has provided new types of employment opportunities that are more attractive and these are factors pulling rural youth out of paddy farming.

These non-farm occupations have another attraction in comparison to farming. They provide a secure income. Therefore, these avenues of employment are attractive owing to higher and secure cash incomes and cultural and

sociological factors. They are especially attractive to the educated youth in the villages. We must also take note of the fact that large numbers are employed in the armed forces and in foreign employment.

These push and pull factors have altered the rural labour market significantly. These factors must be taken into account when strategies for the rice economy are considered. It will be counter-productive to be sentimental and talk about rice farming being a way of life, an integral part of our culture and romanticizing rice farming. The real situations in the villages are very different. The youth in particular want to leave rice farming, there are severe shortages of labour and wage rates are too high relative to the productivity of labour.

These developments have both positive and negative implications for rice farming. Among the positive factors is the possibility of farmers taking a greater degree of risk in rice farming, as they have other sources of income. A farm household would be able to adopt better cultivation practices as these other sources of income, as well as access to credit arising from the other income bases, reduce the prospect of capital rationing on rice farming. The increased availability of capital resources and less risk aversion could in fact increase productivity in rice farming.

These positive factors must be tempered by several negative possibilities. Foremost among these is that rice

farming becoming a part-time occupation could lead to a phasing out of the farm activity. Such a phasing out would be expedited by the cost-price squeeze mentioned earlier, labour shortages, especially at the peak periods, and the inability to find the time to devote to the farming activities owing to obligations in the other economic activities. There is the ever-present danger that it would be rational for the "farm" household to maximise income by lesser and lesser resources being utilized in rice farming. Economic rationality suggests that the available resources should be put to the occupation giving the maximum returns and rice farming may not qualify on this basis. In other words, at the level of the household it would be economically rational not to attempt the maximizing of rice output. The rational objective would be to maximize household income. Consequently, rice output on some farms will not be at the maximum level.

It is important to realise that this transformation of rice farming into a part-time occupation is not an isolated development in Sri Lanka. It is a phenomenon that is taking place in many other parts of Asia to a greater or lesser extent and the reasons for this happening are more or less the same factors as I have mentioned. The recent Asian Development Bank study on Rural Asia for instance underscores this development as a significant change in many Asian countries.

Once again I wish to emphasize that it is important to recognise these

changing conditions in and around rice farming. They have an important bearing on a strategy to increase rice output. It is in this context that I wish to discuss three challenges facing rice farming today. These are the three closely related issues of the viability of rice farming, the need to increase national yield levels and the development of an institutional capability to serve rice farming achieve these objectives.

As pointed out earlier, farmers are faced with a very serious cost-price squeeze. There is clear evidence that the majority of rice farmers are finding rice cultivation uneconomic in the sense that incomes derived are inadequate for their basic living. This is resulting in an increasing trend of rice farming becoming a part time occupation. This has both positive and negative impacts. This issue has to be examined objectively and its implications faced squarely.

The second issue is the bridging of the yield gap. While Sri Lanka's rice yields are relatively high compared to other rice growing countries with similar agronomic conditions, there is a large gap between the potential yields and the realized yields. In broad terms, the potential yield is about 11 metric tons per hectare, while the realized average yield is about 3.8 metric tons per hectare. The bridging of this gap would mitigate several of the problems faced by the country's rice farmers and the economy. This gap cannot be bridged completely, but even if yields could be increased to about one half the potential yields, there

would be significant gains in national rice output, it would enhance the viability of paddy farming to a significant extent and increase rural incomes and employment.

There are agronomic, technological, institutional and economic issues to be resolved to reduce the yield gap. The agronomic constraints to higher yields include unsatisfactory land preparation, poor soil fertility and practice of wrong cultural practices. An extension gap which does not transfer research findings and good practices to the farmer, low farm gate prices and the lack of credit are among the other deficiencies preventing the achievement of higher yields. Reducing the yield gap is a foremost issue for rice scientists, economists, extension specialists and agricultural economists to address.

The strengthening of the institutional framework serving rice farming is of utmost importance in resolving the two issues mentioned earlier. New and more cost-effective mechanisms would have to be developed to ensure that rice farmers have access to credit, research findings, seed material, fertilizer and other inputs. Above all the marketing mechanisms for rice have to be strengthened to ensure that the market margins between the farm gate price and the consumer price are reasonable.

These do not exhaust all the challenges facing the rice economy, but they are, in my view, among the most important. The resolution of these issues requires research, objective examination

of the issues and fresh thinking unbridled by past paradigms.

Most of what I have said is rather dismal. What I wish to focus on now is hopeful and optimistic. The Department of Agriculture has developed a program that could address the basic problems we are facing and thereby give relief to other aspects of the problem that I have dealt with. The Department of Agriculture has developed the YAYA Block Demonstration Project, which is an institutional program to ensure proper cultivation practices and ensure adequate credit and other inputs for selected tracts. It bridges the research extension gap, as well as ensures that the optimum inputs are available and utilized. By adopting this program yields have been increased by nearly 50 per cent on the tracts participating in the program. Such an increase in yields changes the cost of production of rice, enhances farm income from rice and changes the viability of rice farming.

Let me indicate in a little more detail the features of this programme and results obtained. This program adopts appropriate cultivars for specific locations, uses quality seed with encouragement for farmers themselves to produce their own quality seed and ensures timely cultivation. A vital component of the program is the soil fertility improvement and avoidance of improper ploughing practices. Other elements in the program include optimum stand density, nutrient management, weed

and pest control and minimization of post harvest losses

The program is implemented on the basis of farmer organizations undertaking the improved cultivation practices in collaboration with a well defined role for an agricultural extension worker. The program attempts to develop a "collective" cultivation of rice in the tract with an effective supply of inputs, linkage with institutional credit schemes and ensuring the marketing of rice.

This program has achieved yields of between 7.6 to 8.8 tons per hectare on average in the dry and intermediate zones under major and minor irrigation schemes. Under rainfed conditions the *maha* yield doubled to 6 tons per hectare.

The expansion of this package could increase the average yield in major, minor and rainfed systems to 5.7, 5.4 and 3.9 tons per hectare, respectively. The national yield average could be expected to increase by 30 per cent to about 5 tons per hectare.

The outreach of this program at present is too limited to have a significant national impact. What is needed is a speedy expansion of the program. There should be adequate resources to expand this program over the next few years to cover around 75 per cent of dry zone paddy tracts and about 60 per cent of wet zone paddy areas. If this is done the national average yield could be increased by over 30 per cent.

There is also the need to improve the cultivation practices of farmers who do not come within the Yaya program. Extension services must convey the appropriate technologies for higher productivity. Credit programs should be strengthened to provide the means for purchasing the optimum inputs and farmers should be assured of a reasonable and fairly stable price for rice.

There are two other issues I want to focus on very briefly. There is considerable talk about the country exporting rice. This has been an emotional issue. The export of rice is considered the pinnacle of achievements, the realization of the country's ancient glory, the hallmark of a robust economy. I wish to discuss this issue rather dispassionately. The earlier discussion of the country's paddy performance made it clear that generating an exportable surplus was some distance away, especially if we tilt our policies to favour rice consumption at the expense of the increasing trend in wheat consumption and per capita rice consumption increases due to improvements in incomes as well.

Apart from the issue of having an exportable surplus, there are other considerations that make it very difficult to foresee the export of a significant volume of rice. This is due to the fact that the our costs of rice production are higher than the international prices of equivalent rice varieties, there is a declining trend in rice prices and projected rice prices are lower than current prices and the quality of rice produced in the

country has no international demand. There is a need to improve our milling of rice to render the rice quality more comparable with internationally traded varieties. By and large the prospect of exporting rice is bleak at present. If we are to achieve an exportable surplus and an internationally competitive situation with respect to our rice, the thrust to increase rice production must be considerably stronger and the strategy must include components that resolve the issues of quality and price.

I speak of the other aspect rather tentatively as it is beyond my fields of expertise. This is the issue of research in hybrid varieties, which is the current international scientific thrust. My view is to be cautious on this front, in view of the high cost of this research, the high cost to farmers of adopting hybrid varieties and the experience of other countries, notably India, where there was a consumer aversion to hybrid rice. I do not wish to be misunderstood here. Perhaps the future in rice is in hybrid varieties. Yet a policy of caution, of hastening slowly-*hemin hemin*- may be prudent.

Having said this, it is important that rice research should continue apace as any retardation could have serious disadvantages in the future. If our research fails to keep apace of other rice producing countries, then our international competitiveness could be adversely affected. It is also a well-observed phenomenon that new research findings and an increase in the yield ceiling tend to pull up yield levels.

We must continue to develop higher yielding varieties, varieties more resistant to pests and diseases and varieties less dependent on imported inorganic fertilizers. Our rice research must attempt to reduce the cost of rice production and develop cost-effective technologies consistent with the changing resource availabilities that I have discussed. This includes the need for appropriate mechanization of cultivation to meet the emerging shortages in labour.

### CONCULSIONS

Let me conclude with three broad imperatives for increasing the productivity and sustainability of rice farming in the next decade.

The first challenge is to develop a framework of overall economic and agricultural policies that have clearly defined objectives and are consistent. These policies would include import and pricing policies for cereals, a clear policy on the question of direct or indirect subsidies for inputs, ensuring a remunerative and fairly stable price for rice and the mechanisms to make these effective. In brief, there is a need for a clearly articulated macro economic policy framework for rice for the next decade. Year-to-year changes in policy are likely to erode the confidence of rice farmers and may threaten the sustainability of rice farming. A predictable policy for rice is vital.

The second need is a much larger funding of research and a revamping of rice research and other related institutions. There is a dire need to increase the research and technological capacities of these institutions and to retain quality staff.

The third requirement is an enhancement of the institutional capacities serving agriculture, such as extension services, credit delivery, rice milling, processing of rice, improvement of post harvest handling of rice and marketing channels. These have been neglected issues in the last two decades and cannot remain so in the next decade without threatening the viability and sustainability of rice farming.

One last word. There is a need to find out what is actually happening in rice farming. Quality socio-economic studies are needed to comprehend what I have elsewhere described as the "new dynamism in rice farming". I brought out these issues earlier on the basis of some fragmented evidence. There is a need to get far more scientific data and information so that we understand the economic and sociological dimension of rice farming, rather than be guided by our understanding of these from past conditions which have changed drastically in the last decade or more.

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**CHAPTER 2**

**NATURAL RESOURCES BASE**