Agricultural Development in an Emerging Non-Agrarian Regional Economy: Kerala's Challenges

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Changes in Kerala's economy have led to a structural transformation, giving it a non-agrarian character, both in terms of income and employment. This poses new difficulties for agricultural development at a time when there is a scarcity of labour as well as profits. The present stagnation in the state's agricultural sector has come at a time when its non-agricultural sector has been growing at more than 9% per annum. In this sense, the current challenge of rejuvenating Kerala's agriculture is of a qualitatively different kind in its developmental history. This paper probes the issue and puts forth a set of measures that are needed to meet the problem head-on.

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While Kerala's population has a vibrant record in discussing and debating the state's challenges in economic development, there is something that is yet to catch the public imagination. This is the ongoing structural transformation of the state's economy from an agrarian one, dominated by agriculture in both income and employment, to a non-agrarian one, dominated by non-agricultural activities (Table 1). When I say "non-agrarian", I am not only referring to the occupational shift away from agriculture but also the conscious destruction of feudal agrarian relations that came to an end with the Land Reforms Act in 1971. In terms of textbook knowledge, such a transformation occurs only at a much higher level of income than the one Kerala presently enjoys. In 2004-05, agriculture and related activities accounted for only 22% of state income and 37% of employment compared to 22% and 57%, respectively for India as a whole. Data for 2008-09 show that in Kerala the share of agriculture and related activities in state income has come down to between 11% and 12% and, I would hazard, that the share of employment could be well below 30%.

Table 1: Sectoral Shares in Income and Employment and Sectoral Product: Kerala and All India

Indicator	Primary	Secondary	Tertiary
1993-94			
Income	32 (33)	20 (24)	48 (43)
Employment	49 (65)	21 (14)	30 (21)
Sectoral product	0.65 (0.51)	0.95 (1.71)	1.6 (2.05)
2004-05			
Income	23 (22)	21 (25)	48 (43)
Employment	37 (57)	25 (18)	38 (25)
Sectoral product	0.62 (0.39)	0.84 (1.39)	1.26 (1.72)

Figures in brackets stand for all India.
Source: Based on the Central Statistical Organisations National Summary Data Page (NSDP) database for Kerala and gross domestic product (GDP) data for all India. Employment data is from the 50th and 61st rounds of the National Sample Survey (NSS).

While the Kerala scenario is certainly a more desirable one in terms of employment, does it mean that agriculture should no longer be considered a priority issue in the state's development planning? Certainly not. This is because agriculture and related activities have an important role in ensuring the availability of food for the people as well as supplying raw materials for a variety of agro-based industries. However, it is important to remember that Kerala is only a part of a much larger country. Historically, this has enabled Kerala to specialise in the cultivation of high-value crops, earning higher incomes from agriculture. It is in this larger context that we need to examine the challenge of agricultural development in Kerala.

The current challenge is to overcome the inter-sectoral inequality in sectoral product per worker arising out of a fast-growing non-agricultural economy and a stagnating agricultural one (Table 2). This new stagnation in agricultural production was preceded by impressive growth for a little more than a decade; as such the current phase of stagnation has occurred at a higher level of productivity than earlier (Figures 1 and 2). A concomitant feature of this situation is not only the decline in the share of workers/households engaged in agriculture (which is not an undesirable one given the low land-man ratio) but also a steady exodus of the younger age group to non-agricultural activities. This has resulted in an absolute decline in the gross cropped area (Figure 3, p 66). The central challenge therefore is to raise agriculture to a level of productivity and income that will sustain a critical minimum of workers and households.

Table 2: Sectoral Growth Rate of Kerala Economy (1970-71 to 2007-08)

Sector	1970-71 to 1983-84	1984-85 to 1996-97	1997-98 to 2007-08	1970-71 to 2007-08
1 Primary: agriculture	-0.24	4.64	0.21	1.67
2 Primary: non-agriculture	-1.88	3.52	1.75	0.48
3 Primary sector (1+2)	-0.62	4.43	0.49	1.41
4 Secondary sector	3.49	7.25	9.08	5.20
5 Tertiary sector	3.35	6.15	9.78	6.07
6 All sectors (3+4+5)	1.64	5.84	7.79	4.46

Source: Based on the CSO's NSDP database, accessed from the Economic & Political Weekly Research Foundation (EPWRF 2003) and http://mospi.nic.in. The periodisation is dictated by the periods of stagnation and growth in agriculture as revealed in Figure 1.

Three Myths

I want to start by refuting at least three myths that in my opinion are ingrained in the popular imagination. The first is that Kerala is not food-secure. This flies in the face of empirical evidence, which has been documented in several studies, including the recent *Report on the State of Food Insecurity in Rural India* published by the M S Swaminathan Research Foundation (2008, Chennai). This latest study reports that Kerala was the only state in India that was Least Food Insecure during 1998-2000. It retained its position in 2004-06 as well, with two more states – Punjab and Himachal Pradesh – joining the league. This is because it is now well accepted that food security is not entirely dependent on production but, more importantly, on the ability of all sections of the people to access food and consume an adequate amount, as shown by nutritional and related health outcomes. Viewed from this larger perspective, Kerala not only has very high purchasing power compared to the rest of the country (it has been the first among the states in terms of per capita consumer expenditure since the late 1990s) but also a relatively well-functioning public distribution system (for instance, distribution of rice at subsidised rates through ration shops, free mid-day meals for schoolchildren up to the seventh standard, and supplementary nutrition for pre-school children and pregnant mothers through anganwadis and the Ashraya scheme for the destitute)[1] to make food available to the relatively poorer sections of the people. In addition, it also has a better record in sanitation and care of children. As such, producing food locally is not a sine qua non for ensuring food security.

The second myth relates to the popular perception that agriculture is not viable in Kerala. This is also not empirically correct because available evidence shows that Kerala stands second-highest in terms of value generated per hectare of land (Punjab is at the top). In terms of net income, it is the third highest (Table 3). What this means is that Kerala's farmers are quite efficient in making the best use of the limited land available through crop selection, mixed cropping, and the application of modern technology.

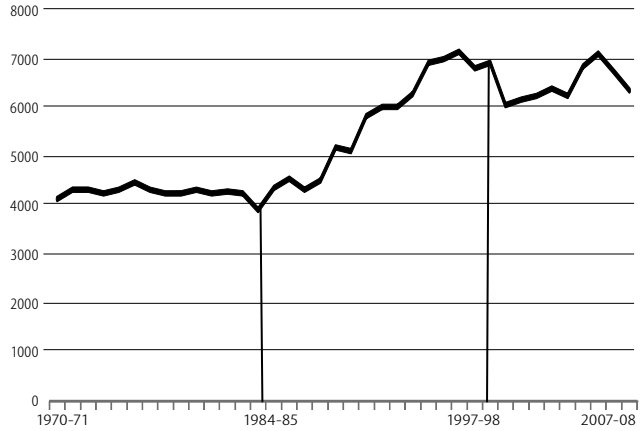
Table 3: Value of Output, Cost and Net Income, 2003 (Rs per hectare)

	Output	Cost	Net income
Kerala	27,197 [2]	10,276	16,921 [3]
Punjab	28623 [1]	11,991	16,632 [4]
Uttarakhand	25,536 [3]	4,178	21,358 [1]
J & K	23,214 [4]	5,147	18,067 [2]
All India	12,535	5,841	6,694

Figures in brackets show the rank among the 20 major states in India.
Source: National Commission for Enterprises in the Unorganised Sector (NCEUS 2008), "A Special Programme for Marginal and Small Farmers". Figures computed using NSS unit level data from the 59th round on *Situation Assessment Survey of Farmers*, 2003.

A third myth relates to oft-repeated statements in the local media that Kerala's workers are either lazy or unwilling to do agricultural work. This is an oversimplified assessment that does not take into account the totality of the dynamics of socio-economic conditions in the state. I must point out that an overwhelming proportion of the younger generation in Kerala is now better educated than the earlier generation. Most of those belonging to the younger generation – below 35 years – have at least 10 years of schooling. An increasing proportion now completes the 12th standard and attends colleges. This has raised the aspirational level of the younger

Figure 1: Growth in Agriculture (Crop Cultivation) (1970-71 to 2007-08, Rs crore, at 1993-94 prices)



Source: Based on the CSO's NSDP database, accessed from EPWRF (2003) and http://mospi.nic.in

Figure 2: Growth in State Income (NSDP) (1970-71 to 2007-08, Rs crore, at 1993-94 prices)

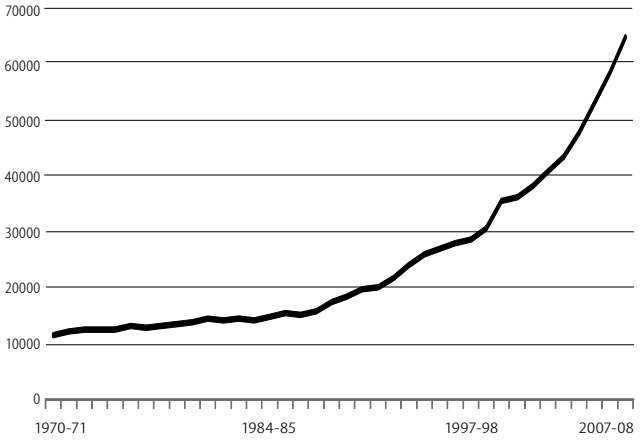
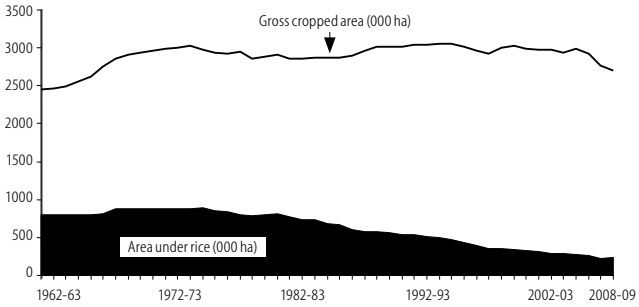


Figure 3: Trends in Rice Cultivation in Kerala for the Period 1962-63 to 2008-09



Source: *Kerala Economic Review*, various years.

generation and prompts them to search for "jobs" that offer regularity in employment and social security. In sum, they are seeking jobs and not work of a casual kind that that is often associated with a low labour status. This is reflected in that more than 85% of those registered in the employment exchanges had at least a matriculation certificate as of March 2009.[2] This should also be juxtaposed with the increasing opportunities in the non-agricultural sector, especially in services that offer higher wages and salaries for the relatively better educated. For Kerala, there is the additional attraction of the labour market in Arabian Gulf countries, where much higher salaries can be earned even by those with only high-school education. All these continue to contribute to a movement of young people away from agriculture. That is why Kerala is now witnessing a steady flow of migrant labour from eastern and central India for a variety of unskilled manual work, with wages that are two to three times higher than in those regions.

All these arguments are not intended to mean that agriculture development is not a problem in Kerala. On the contrary, my main purpose is to emphasise that Kerala's agriculture has to move to a higher level of productivity through the adoption of appropriate modern technology, facilitated by appropriate organisational and institutional arrangements. What should be worrying the government as well as the people is that Kerala's agriculture has been in another phase of stagnation since the late 1990s. This had been preceded by a period of growth from the mid-1980s. If we take the last four decades, the period up to the mid-1980s had been one of stagnation in agricultural production but it was followed by impressive growth until the late 1990s.[3] This has now again been replaced by a period of stagnation. But the overall growth of the Kerala economy since the second half of the 1980s has been quite impressive, reaching an unprecedented rate of 7.8% per annum during the last decade, led by both the secondary and tertiary sectors (Table 2). In the context of the economy growing at a high rate since the late 1980s, the poor performance of the agriculture sector has resulted in further pushing people away from it. Since it is the better educated who find it easier to move out of agriculture, the agricultural sector also lags behind others in terms of the number of educated people in it. However I must add that the average education of those engaged in agriculture in Kerala is much higher compared to all other states in India. Correspondingly, Kerala has a much higher potential for increasing agricultural productivity and thereby incomes. It could thus retain the required number of people in agriculture, assuring them not only livelihood security but also a decent income. It is the realisation of this potential that has emerged as a major challenge in the present context of Kerala.

Favourable Factors

The first and most favourable factor for further agricultural development in Kerala is that the economy as a whole is in a stronger position than before to support agricultural development. As I said earlier, this is because close to 90% of income in the economy is generated from non-agriculture, which makes it easier for the government to protect and support agriculture. This is also the historical experience of most of the developed countries where only a very small proportion of the workforce is engaged in agriculture. In countries such as Japan, the United States (US) and those in the European Union (EU), the high level of financial and other support for agriculture basically comes from the capacity of the non-agricultural sector, which is channelised by governments in a variety of ways.

A second favourable factor in my view is the relatively high level of educational attainment among farmers as well as agricultural labourers. This is a necessary condition for absorption of modern technological practices in agriculture. When innovative technology and practices are introduced, the learning curve for an educated agricultural workforce is likely to be much shorter than for a less educated one. This perhaps explains why Kerala's farmers usually respond more positively to new crops, new practices and modern technological advances.

A third favourable factor is the high density of organisations among farmers. As we can see in Table 4, the *Situation Assessment Survey of Farmers* carried out in 2003 by the National Sample Survey Organisation (NSSO) revealed that nearly 60% of the farmers were members in cooperative societies, compared to just 30% in all India. Nearly 20% of the farmers were members of registered organisations of farmers; my own impression is that there are also innumerable unregistered associational organisations such as *Padasekhara Samitis*.

Table 4: Membership Organisations and Access to Information on Modern Technology (percentage of farmer households, 2003)

Indicator	Kerala	All India
Membership in coop societies	59.7	30.0
Membership in registered farmers' organisations	19.9	4.8
Access to any government agency as a source of information on modern technology	18.3	7.2

Source: NCEUS (2008), "A Special Programme for Marginal and Small Farmers". Figures computed using NSS unit level data from the 59th round on *Situation Assessment Survey of Farmers*, 2003.

A fourth favourable factor is the existence of a vast network of primary agricultural credit societies, primary cooperative agricultural banks and rural development banks supported by central and apex cooperative banks. This is in addition to regional rural banks as well as the wide network of commercial banks, which also disburse loans for agricultural purposes. Also cooperative credit societies in Kerala have a much better record of functioning compared to the rest of India though they have to go a long way towards strengthening their activities and playing a more supportive role in increasing agricultural production and productivity.

A fifth favourable factor is a well spread out network of research, development and extension agencies in agriculture, including veterinary, diary, fishery and other services. Of course, there is the need to assess possible gaps between research and extension on the one

hand and extension and absorption by farmers on the other. Based on my limited interaction with agricultural scientists, extension personnel and farmers, I would venture to hypothesise that the extension activities as well as the absorptive capacity of farmers and agricultural workers have not yet acquired a critical threshold as to make a perceptible difference in agricultural productivity. Had this been the case, the growth rate in agriculture sector during the last 10 years would not have been as dismal as it has been.

A sixth favourable factor is the introduction and gradual institutionalisation of panchayati raj institutions at the village, block and district levels, to which nearly 30% of the plan funds are handed over. I think strengthening this system will go a long way towards changing the face of agriculture and related primary-sector activities, taking them to a higher level of productivity facilitated by modern technology and the introduction of innovative organisation. The potential of the panchayati raj in Kerala has greatly been strengthened by new organisations of women from poorer households such as Kudumbashree, which are now active in reviving a variety of agricultural activities through new forms of organisational intervention.

Unfavourable Factors

The importance of the favourable factors cited above should not be minimised, especially against the background of the situation in a majority of other states in the country, which are yet to attain them. However, Kerala has a few but quite critical unfavourable factors that need to be addressed as quickly as possible.

One is the failure of the public irrigation system in fulfilling its basic responsibility of managing water, especially for irrigation. Only around 16% of the gross cropped area is irrigated, and government canals account for less than 30% of this area. New methods of irrigation, especially those based on a decentralised framework involving efficient use of available water, are yet to catch on. Kerala has spent huge sums on public irrigation facilities, most of which have either not yet been completed or only partially completed with enormous time and cost overruns.

A second unfavourable factor from the point of view of farmers is the high cost of labour. The increase in wages for agricultural work has been much faster than the increase in labour productivity. This is because agricultural wages are largely set exogenously; first by trade union bargaining and then by a shortage of labourers because of the pull of high-wage activities such as construction. However, from the general point of view, high wages in the agricultural sector also mean higher incomes for agricultural labour households, contributing to a reduction in poverty. The only way to retain farmers' profitability or even enhance it is to go in for labour-saving technologies that will raise labour productivity while enabling payment of higher wages. But this could also lead to a move away from more labour-absorbing crops such as rice to less labour-absorbing crops such as coconut and rubber. This is what has been happening during the last three decades.

A third unfavourable factor is the low level of skill and specialised knowledge possessed by a majority of those who remain and work in agriculture. It goes without saying that the challenge of introducing modern and environmentally sustainable technological packages in agriculture is also dependent on the availability of a skilled and trained workforce. Although there are many examples of technological and organisational changes in Kerala in recent years (especially in horticulture, mixed farming with non-farming activities such as fish culture, livestock rearing, bee-keeping, and so on), the level of skill and specialised knowledge warrants urgent upgrading to realise the potential productivity in agriculture.

A fourth unfavourable factor is the absence of an institutional mechanism to take care of the risks associated with agriculture (for example, crop failure) and the absence of adequate social security cover for those who work in agriculture. In recent times, these two concerns are being addressed but there is still a long way to go in terms of coverage.

A last unfavourable factor perceived by many is the highly fragmented and small size of agricultural holdings. Marginal holdings less than one hectare in area comprise 87% and small holdings less than 2 hectares in area are 8.5%. This makes a total of 95%, which accounts for 78% of output. In India as a whole, the percentage of small and marginal holdings is around 84%, accounting for 51% of output (Table 5). I must point out that the small size of holdings need not necessarily be a deterrent to high productivity. This has been amply demonstrated by the historical experience of Asian countries such as Japan, China and Vietnam. For example, while the productivity of rice in Kerala is around 2.5 tonnes per hectare, it is well over five tonnes in these countries, with Japan close to seven tonnes.

Table 5: Percentage Shares of Small and Marginal Cultivation (2003)

	Kerala	All India
Holdings	95	84
Land possessed	80	46
Output	78	51

Source: NCEUS (2008), "A Special Programme for Marginal and Small Farmers". Figures computed using NSS unit level data from the 59th round on *Situation Assessment Survey of Farmers*, 2003.

The Future of Rice Cultivation

I must digress to make a short detour to the situation of rice cultivation in Kerala, which continues to attract considerable public interest and even concern. At the current level of rice productivity (the state average being 2.5 tonnes per hectare per season), it is extremely difficult for farmers to sustain rice cultivation given the high cost of labour. In rice-growing states/regions where productivity is higher than Kerala (such as Punjab, Haryana and coastal Andhra) but wages are lower, rice cultivation is a much more profitable venture. In many other states, even if productivity is low, the labour cost is considerably lower and that also makes rice cultivation a more profitable undertaking than in Kerala.

In the context of Kerala, there is an additional factor in the form of stiff competition from substitutable crops such as coconut and banana and a variety of mixed crops. This is because its agro-climatic conditions allow for the cultivation of a variety of crops in most parts of the state. There is no other state in India that has such a high density of different crops as Kerala. This is especially so because a large part of the cultivable rice lands can support mixed cropping as against monocropping in most parts of India. In addition, crops such as rubber were given special treatment through institutional support and it also happens to be a raw material for a number of growing industries. This has resulted in a continuous expansion in the area under rubber and also in productivity. The expansion of area under rubber was mostly at the expense of coconut; but this, in turn, has led to the spread of area under coconut to areas that were previously under rice. Of late, the economics of banana

cultivation also pose a serious challenge to rice cultivation by taking away land from it.

To this one must also add problems associated with the management of labour in terms of timely availability, supervision and other related aspects. For farmers who are less inclined to devote time and effort to the management of labour – and there are many, especially in households with a significant share of non-agricultural income – this is a factor inducing them to shift to less labour-absorbing crops, which also happen to be more remunerative.

It is therefore not surprising to see that there has been a decline in the area under rice cultivation since the mid-1970s (see Figure 3). The rate of decline has been much faster during the last 15 years compared to the previous 20 years. An expert committee on paddy cultivation that submitted its report in July 1999 examined the issue in great detail and made a number of recommendations that basically focused on increasing productivity as well as incomes through integrating rice cultivation with other related activities.[4] The instrumentalities for realising these two objectives included setting up institutions and organisations for the introduction of modern technology (not just mechanisation), thereby retaining around 3,00,000 hectares (net) of land under paddy with a cropping intensity of two, making it possible to reach 6,00,000 hectares of gross cropped area under rice with an average productivity of 3.5 tonnes per hectare. This was to be achieved by identifying block panchayats that were most suitable for paddy cultivation and produced relatively high yields. Such blocks were identified and listed in the report. I am not sure if the then government or the one that came to power after it paid serious attention to this report while formulating policies. I can only say that given the economic logic and the management constraints under which farmers operate, it is no wonder that the area under rice has shrunk to just 8% to 9% of the gross cropped area compared to 28% to 32% during the 1970s and 1960s, respectively.

While the economics may not favour rice cultivation from the farmers' point of view, I suppose there are powerful larger considerations that call for efforts to protect the cultivation of this crop. Central to this perspective is the environmental dimension because the ecology of rice cultivation serves as a medium for water retention, seepage and consequent recharging of ground water as well as providing natural drainage. Ecological and environmental scientists are of the view that filling up such natural drainage systems for growing other crops or for non-agricultural use will seriously damage the ecosystem, with adverse consequences to society at large. If Kerala's population recognises this larger and fundamental role of rice cultivation, there is a strong case to pay an extra price for the preservation of rice cultivation in the state. More on this later.

Strategy for Enhancing Productivity

I have already referred to the experiences of countries such as Japan, China and Vietnam to emphasise that the small size of holdings need not be a barrier to agricultural development. What these experiences suggest is the need for a "group approach", given that several operational decisions have to be taken jointly. With all the farmers' organisations in Kerala, it is not difficult to bring about a group approach in agricultural operations. A group farming approach was tried and tested for a brief period in the late 1980s and early 1990s but the official policy later got relegated to the background. However, it is my understanding that farmers continue to practise such an approach, motivated by objective conditions, and what is needed is a policy to strengthen it through appropriate incentives.

The central challenge is to overcome the current phase of stagnation – the second during the last four decades – in agricultural productivity. While technological solutions are often given due recognition and importance, an equal weightage is often not accorded to organisational and institutional issues. It is therefore important to focus not only on "farming" but also on "farmers", emphasising the two sides of technology and organisation in the process of transition to a modern agriculture. The concept of modern agriculture has also in recent times undergone a change in connotation. Today it is no longer considered desirable to encourage chemical fertilisers and pesticides, given the long-term damage they might inflict on the soil as well as human health. Therefore, alternatives in the form of bio-fertilisers and pesticides are being actively encouraged the world over. In many parts of Kerala, a beginning has already been made in this direction, if one goes by reports coming from village panchayats. The challenge is to not only to maintain the existing level of productivity but also to enhance it to meet the growing demand for agricultural products.

I must mention that when one talks about the introduction of modern technology, it is often confused with mechanisation. Although experts in the field do understand the many-sided nature of modern technology, this has to be emphasised in public policy and popular understanding. Technological changes based on hydrology (for water resource management) and biology (such as high-yielding varieties of seeds, tissue culture, bio-fertilisers and pesticides) are more powerful in enhancing agricultural productivity than the mere introduction of mechanical technology. However, the challenge here is not just the generation of modern technological solutions and innovation but its diffusion, which will result in their adoption by those engaged in agriculture for increasing productivity. This calls for appropriate innovations in organisations and institutional arrangements. An active and vibrant extension network is a necessary condition. The existing organisational arrangements for land and water management have, as I mentioned earlier, a dismal record. An alternative such as a decentralised system has only begun to emerge. Moreover the use of water in more efficient ways such as through precision agriculture, drip irrigation, and so on are still in their infancy. The basic units of planning for land and water management are watersheds, which have made some headway in terms of mapping, but tapping their potential is still a long way off.

Here I see a great window of opportunity for taking advantage of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). Although it is a social security scheme to provide some income through providing employment to needy rural households, it has demonstrated its capacity to create "natural capital" through land and water resource development. In Kerala, as well as in all of India, this scheme could be combined, wherever feasible, with other schemes and projects related to land and water management such as soil conservation, minor irrigation, schemes under the Rashtriya Krishi Vikas Yojana (RKVY), and so on. The synergy thus created could well exceed the sum of the benefits of such projects when taken up individually.

I would also like to flag an important gap that exists between research, extension and absorption of modern technology (see Table 6). This relates to the absence of a well-trained and skilled workforce engaged in agriculture that could help apply modern practices. The existing system in my view is top heavy with highly skilled researchers and other professionals but it lacks a well trained army of technicians who could work with farmers and agricultural workers in the field. In the healthcare system, the medical doctors are supported by an army of paramedical personnel, from nurses and lab technicians to health inspectors and health workers. Similarly, in engineering, engineers are supported by a battalion of diploma holders and technicians coming out of industrial training institutions, and the like. I am not sure such a contingent of agricultural professionals and technicians exist in the system, perhaps due to the absence of a national policy framework to set up training institutions for different levels of skills and technical expertise. This is something I think the national planning process in general and Kerala in particular should address itself to.

As already mentioned, there is a scarcity of workers willing to work in agriculture. But such scarcity is often not felt when new technologies are introduced and new ways of performing tasks are carried out such as mechanised transplanting and harvesting. This has to do with the notion of labour status and also the need for regular and secure employment. It is heartening to find that some village panchayats in Kerala have tried to overcome this constraint by encouraging and promoting the setting up of labour banks. On the other side, there is also the phenomenon of letting land lie fallow, especially those under seasonal crops such as rice. In recent times, in many panchayats, Kudumbashree groups have come forward to lease such fallow land for cultivation, enabling them to earn some income while contributing to agricultural production. The owners are given a sum of money that could be construed as a form of rent.

Table 6: Sources of Knowledge of Modern Farming
(Percentage of farmers)

Indicator	Kerala	India
Training programmes	2.8	0.9
Krishi Vigyan Kendra	8.4	0.7
Government demonstrations	3.0	2.0

Source: NCEUS (2008), "A Special Programme for Marginal and Small Farmers". Figures computed using NSS unit level data from the 59th round on *Situation Assessment Survey of Farmers*, 2003.

With some imaginative planning and promotional support, along with innovative organisational intervention, it is quite possible to contribute to the twin objectives of increasing agricultural production in the economy while promoting employment and income among the workers. I would therefore propose the promotion of what may be called land-cum-labour banks (LLBS) in panchayats, where owners of idle land could deposit their land and the people who are willing to work in agriculture could deposit their surplus labour. By matching these two, the LLBS could function in such a manner as to reward both parties. Such an arrangement can ensure a degree of regularity of employment and social security, as has already been demonstrated in some of the village panchayats where only the labour bank part has been attempted. They could also be the custodians of agricultural machinery and other tangible assets bought with the support of the government and its agencies. This will also overcome the difficulty of innumerable small farmers having to buy new machinery on their own. Ideally such LLBS can also function as agents of technological change by adopting innovative methods in farming, livestock rearing, fish culture and similar activities. They can also deal with the banking system for accessing credit.

While such alternative organisational interventions could be pursued actively as a matter of policy, farming and related activities are likely to remain private operations that are carried out by households. The thrust of a new strategy therefore should be in the form of encouraging a group approach, whether in the matter of buying inputs, hiring mechanical equipment, carrying out agricultural operations or even marketing agricultural products. There are many examples of such group-based activities that could, and need to be disseminated throughout the state to make a perceptible impact.[5] The basic objective of the new strategy should be to maximise the value per unit of land as well as per unit of labour because both these are in short supply. There is no doubt that this calls for a much higher level of public investment and also imaginative planning for encouraging innovation and its adoption by farmers.

While there are several encouraging developments in a few panchayats along the lines that I have indicated here, it is my firm understanding that Kerala has not yet reached a critical threshold in modernising its agriculture so that it will assure a decent livelihood to the families engaged in it, especially small and marginal farmer households. From the point of view of providing livelihood security and a level of income that retains a critical minimum of the population in agriculture, what is needed is an integrated approach that combines both farming and non-farming activities within the primary sector. Some of the well-known examples that are already talked about are rice cultivation, fish culture and livestock rearing or strengthening mixed cropping to reduce the risks associated with particular crops, alongside agro processing. However, from the basic livelihood security point of view, public policy has to provide for crop insurance and social security to take care of contingencies such as sickness and old age.

The Special Case of Rice Cultivation

It is in this larger perspective of a new strategy for agricultural development that we need to examine the prospects of rice cultivation as a special case. At the current level of productivity of around 2.5 tonnes per hectare it does not seem to be an economically viable proposition. The area now under rice is largely, if not only, concentrated in three regions where agro-climatic conditions as well as the critical factors of land and water management are in favour of its cultivation. These are the Kuttanad region, the Alathur-Chittur taluks of Palakkad and the Kole land region in Thrissur, where the reported yield is between four to five tonnes per hectare. At this level of yield, farmers have reported that rice cultivation is economically viable. Of course, a part of the cost is now borne by the rest of society in the form of subsidies for various purposes. The challenge therefore is to raise the productivity of rice to around 5 tonnes per hectare per crop for a large area under rice. A more focused approach targeting block panchayats (and village panchayats within them) with incentives for attaining this yield is worth pursuing as a priority. If at least 3,50,000 hectares can be retained under paddy cultivation and attain an average yield of at least 4 tonnes per hectare in the short run, it would exceed the maximum Kerala produced in the latter half of the 1970s. It is with this objective in mind that the planning

process has to help introduce appropriate technological and organisational solutions. We need to remember that the current area under rice is only 2,34,000 hectares (against a peak of 8,85,000 hectares in 1975-76) and the proposed initiative will have to restore at least 1,16,000 hectares to rice cultivation.

Public expenditure will have to be primarily directed at supporting production-oriented activities because the constraints in enhancing productivity continue to be technological and organisational in nature. Price support and untied cash subsidies may be attractive in the short run but they will have to be kept to a minimum. The effectiveness of public investment for land and water management and development continues to be a critical one for rice cultivation. The currently wasteful expenditure on large irrigation systems will have to be increasingly replaced by a decentralised system based on the development of watersheds. The idea of LLBs can be easily applied to the restoration of rice cultivation with appropriate policy support and a package of incentives within the panchayati raj framework. I would also emphasise the urgent need for creating a skilled army of agricultural technicians. Innovative rice farming methods such as single or double sapling farming, selection of seeds, application and control of water and a variety of similar practices will have to be explored and adapted through trial and error for wider dissemination.[6]

If the people of Kerala recognise and accept the ecological importance of rice cultivation, an extra price will have to be paid for retaining as well as developing it. This could be deemed an environmental tax or subsidy that society will have to be prepared to bear. Despite the various implicit and explicit subsidies that are now given to rice cultivation, the decline in area under rice has been quite sharp. What this points to is that all these subsidies put together have not been sufficient to deter farmers from moving away from rice cultivation. Whether this has been due to competition from other more profitable crops or a rise in the real estate value of land (despite a ban on such conversions) are important factors that call for detailed empirical investigation.

Some Tentative Conclusions

After a period of impressive growth in agriculture from the mid-1980s to mid-1990s, Kerala has fallen into yet another trough of stagnation since the late 1990s. This one has been characterised by a loss of 3,19,000 hectares of gross cropped area (between 1996-97 and 2008-09) compared to the 1,58,000 hectares lost earlier (1974-75 to 1986-87). The loss in the earlier period was restored during the period of growth (1987-88 to 1995-96). Whether a similar restoration will take place this time will depend very much on the shape of policies and programmes. While Kerala's agriculture continues to be a high value one in terms of value generated per unit of land, it has to successfully confront this new trial keeping in mind the fast-growing nature of the non-agricultural sector of the economy. In that respect, the current challenge is qualitatively of a different kind in Kerala's developmental history.

Given its favourable factors and the possibility of converting some of its unfavourable ones into favourable ones, Kerala is well equipped to move to a higher level of agricultural technology to realise its potential productivity. There are already many scattered examples of new technological and organisational solutions but they have not yet attained the momentum to push agriculture to another phase of sustained growth. The role of Kudumbashree in restoring (since 2003) nearly 31,000 hectares of fallow land to cultivation points to the possibility of overcoming this obstacle.

The planning mechanism now in vogue in the state has to take a hard look at agriculture, especially with a view to identifying its strengths and weaknesses and chalking out alternatives for further development. In such an exercise, two issues need to be addressed explicitly – one, the environmental dimension, and two, the need to create a skilled workforce. Public investment in agriculture and related activities call for careful planning and coordination so that synergies can be generated by combining several schemes and projects. It is high time Kerala moved away from wasteful public investment in water control (especially irrigation) and created appropriate alternative organisational mechanisms for a decentralised system in a multi-level planning and implementation framework.

Since the basic constraint is both land and labour, solutions will have to focus on raising agricultural productivity (since there is hardly any extensive margin in agriculture) and the incomes of farming households through a combination of farming and non-farming activities. Measures for covering risks in agricultural and related activities as well as providing adequate social security to those engaged in agriculture should form part of any new strategy.

Perhaps the time has come for a stock-taking of the entire gamut of issues for meeting the challenge of agricultural development in Kerala's fast-growing economy and its fast-transforming society.

NOTES

1 The Ashraya scheme launched by the state government in 2003 is an innovative one where the destitutes are identified by panchayats and municipalities. They are taken care of by the women's group Kudumbashree and given assistance through a convergence of several schemes such as free/highly subsidised foodgrains, medical care, palliative care, housing, and so on. The schemes are prepared by the local bodies and any excess of expenditure over income from existing schemes are filled by their own funds and contributions from the state government. The role played by the Kudumbashree women in the delivery of services is remarkable and worthy of emulation.

2 See Government of Kerala (2010; 467).

3 The earlier phase of agricultural stagnation has been analysed in detail. See Kannan and Pushpangadan 1988 and 1990.

4 See Government of Kerala (1999). The author was a member of this committee.

5 Such examples were telecast and discussed in a "social reality show" called Green Kerala Express to showcase the performance of village panchayats and municipal bodies. It was from February to July 2010 on the DD4 channel.

6 Such an experiment has already been carried in the Wadakancherry block panchayat in Thrissur district with a rice crop area on nearly 4,500 hectares. Started in 2006 under the leadership of the block panchayat, a 400-strong Green Army of trained agricultural labourers has been created. Machines for transplanting and harvesting have been purchased under plan funds and allocated to the Green Army. Through convergence of a number of schemes, including the MGNREGS, better irrigation and water control measures have been introduced. With timely credit made available by the cooperative bank and a number of subsidies, the farmers' cost of cultivation has been brought down. The average productivity of 3.5 tonnes per hectare was enhanced to be more than 5 tonnes per hectare within three years. A detailed study of the social, economic, organisational and technological processes of this experiment covering nine village panchayats in the block is called for. After a visit to this block panchayat, I was convinced that such actually existing examples need to be replicated in other suitable areas with appropriate adaptations.

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