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LAND RESOURCES AND POLICY IN KARNATAKA

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R S Deshpande and M J Bhende*

Abstract

Land is certainly a crucial component in the family of all natural resources. Land-use trends therefore, can impact the economy and ecology simultaneously and sometimes at cross-purposes. Therefore, a long term policy for land use based on trends and carrying capacity is earnestly needed. But given the present trend of liberalization, it is difficult to theoretically justify the process of directing land-use policy from above with State intervention. This can however, be achieved with the help of a proper incentive structure and the chalking out of a broad path for policy purposes. This paper attempts the policy initiative in the land sector based on land-use trends and carrying capacity.

Introduction

A medium-term land-use policy becomes an important tool for handling not only the optimum use of land but also helps in addressing the problem of degradation. Policy interventions in this sector, therefore, require full assessment of the present status, likely impact of the historical, existing and intended policy interventions and, above all, the effectiveness of the institutions dealing with this. Such analysis is confronted with multifarious uses of land for different economic activities. Here it becomes necessary, to bear in mind that land use categories work at cross-purposes and make the process of decision-making difficult. In addition to this, given the present trend of liberalisation, it is difficult to theoretically justify the process of directing land-use policy from above with State intervention, especially when most of the other factors of production are left to free market forces. Probably the only justification for managing and directing land use with a centralised policy, can be its optimum economic use (incorporating social costs and benefits) and sustaining land as a non-renewable resource from the food security and environmental point of view. Therefore, there is wide agreement on the need to have a long-term policy for land-use among academicians and environmental activists.

Land as a basic production resource in the agricultural sector has various uses in the other sectors as well. Management of land resource, therefore, involves inter-sectoral economic linkages as well as intra-sectoral influences caused by different land uses. Broadly speaking, we can classify

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land use into five main categories. The first is land under agricultural crops especially seasonal crops, where use pattern as a dynamic connotation becomes the most important category for any land use policy. Within this category we find land is allocated to foodgrains as also to the non-foodgrain (commercial) crops. The allocation decision between these two sectors depends largely upon relative prices and price elasticity of demand of different commodities. In addition to this, the income elasticity of demand for various commodities also has significant influence on the land-use pattern. However, in a broader sense, to obtain future projections of land-use patterns, it is necessary to arrive at land resources required for different purposes of food and commercial crop economy based on the trends in consumption of these crops. The second use of land relates to forests, in which forest land is defined as land legally allocated to the forest department. Quite often legal ownership and actual use of land in this context are confused. Recently, the Forest Department with the help of the National Remote Sensing Agency has completely mapped the forest area to arrive at different categories of forests. In addition to this, we have orchards and plantations which are ecologically similar to forest lands. The third important component of the land-use policy relates to land for dwelling purposes, urban uses and industrial uses that depends upon the growth of population, rate of change in employment, sectoral composition of employment, and growth as well as changing structure of the industrial sector. Given the process of liberalisation it is more likely that the pressure of population as well as demand for industrial use of land is likely to increase substantially. Fourth, we have large land mass being under-utilised with respect to its economic capability. This group includes fallows, cultivable wasteland and land used for miscellaneous tree crops. These lands have good potential for alternative use but are in the category for various reasons. Lastly, we have vast patches of degraded land spread across each of the categories and also existing separately.

In this paper, we have tried to analyse the existing pattern of land use in Karnataka from the perspective of evolving a long-term policy directing use of land resources in the State. The paper broadly covers four important aspects. Initially, we have discussed the impact of national and international policies on land use in Karnataka. This is followed by an elaborate analysis of institutional impact of agrarian structure in the state. Tracing the changes in land use category is the third important component of this paper. We have analysed this at the district level for all the districts of Karnataka over the last four decades. Finally, we have presented policy contours for Karnataka State.

Impact of International and National Policies on Land Use in Karnataka

The global and domestic economic scenario is changing fast, responding to the policies favouring liberalisation and globalisation. Land

being the major economic resource in a developing country like India, policy changes at the international level as also interventions from the domestic economic parameters influence variations in land use. Therefore, it becomes essential to address the issue of responses of the land-use to global and domestic policy changes. Since independence, land use in India largely remained unaffected by international policies and will continue to be so in future also. However, other policies do impact the land use indirectly. Trade is one such process through which land use gets altered in favour of trade-concentrated commodities. Trade policy is one of the most important international policies that has the potential to impact the domestic land-use policy. Provisions of the WTO like removal of quantitative restrictions and imposition of tariff barriers can influence land-use. Even after these policies become operative, the contribution of foreign trade to gross domestic product in India may remain between 9 and 10% (9.6% in 1996, 9.3% in 1997, 8.8% in 1998 and 10.8% in 2000-01). Agricultural exports presently form about 2% of the GDP (1.95% of GDP in 1996, 1.83% in 1997, 1.62% in 1998, and 1.52% in 2000-01). The contribution of agriculture to India's foreign trade has been decreasing and it is around 19% (20.4% in 1996, 19.5% in 1997, 18.5% in 1998 and 13.3% in 2000-01) (GoI, Economic Surveys, 1996-98, 2000-01). Considering the enormity of the land mass and land use categories, coupled with the meagre contribution of agricultural trade, changes in international trade may not impact land-use very significantly. Heuristically, in Karnataka, even with the largely varying domestic prices, land-use has remained largely inelastic, dominated by the food crops. Thus, even if India's (or Karnataka's) land use is exposed to international prices, which are relatively stable compared with domestic prices, land-use will continue to be inelastic at macro level. This trend will continue as long as food grain production continues to dominate the priorities in Karnataka and in India. Our marginal propensity to consume food commodities is still on the higher side and the proportion of people below the poverty line is still around 33% of the population. The available empirical evidence clearly demonstrates that Karnataka's land use will continue to be more responsive to domestic demand pressures rather than international policies. It is clear that international trade and price developments do not appear to have much influence on land allocation decisions. Therefore, it would be interesting to explore the impact of domestic developments on land-use, specially those dealing with institutional changes.

Interventions from institutions matter in the land-use pattern both as incentive creator as well as land-use modulator. A large number of institutions have direct as well as indirect influences on land-use pattern. Institutions that influence land-use include formal, informal, state initiated and locally generated institutions. The influence occurs through a legal or modulated framework as well as from the creation of incentive structure or a regulatory body. These are the vehicles by which regulations are made and implemented, business and commerce are organised, and

individuals and communities participate in and influence trends. They may be formal or informal, ephemeral or long term, public or private, constituted for a particular purpose and operate at local, community, regional, national or international level. Institutional shortcomings have been frequently recorded as causes of development failure (Chadha et al. 2002). This indicates the need for strengthening institutions and their building capacity to discharge their functions more effectively. With the need to reduce public expenditure, and to improve national economic performance, many functions and institutions currently in the public sector are planned to be moved into private control.

Karnataka Land Revenue Manual, Land Acquisition Act of Karnataka and Land Reforms Acts and Karnataka State Land Use Board are the major legal institutional instruments governing land-use pattern in the State. Among the non-state informal village institutions, the most important ones are: caste (jati) panchayats, village panchayat (non-PRIs), traditional village administrative structures (Gowda, Patel, Shanbhog, Kulkarni, Patwari etc). These institutions directly or indirectly influence patterns of land-use. We can group them among legal institutions, monitoring institutions, and incentive-creating institutions. The main institutions influencing, the land-use patterns in Karnataka can be categorised into four groups: each of them has a major bearing on the ultimate land-use patterns of the state (Burns and Deshpande 2001).

- (i) Institutions governing land ownership and monitoring land-use
- (ii) Institutions for development of technology and transfer/ dissemination of the technologies developed.
- (iii) Institutions covering supply of credit and finance to the farming community.
- (iv) Institutions that help marketing of agricultural commodities.

These four components directly or indirectly monitor the use of land resources and tone the agrarian structure¹ in the State. One of the important interactions is the following.

Land reforms is an integrated programme of measures designed to eliminate obstacles to economic and social development arising out of defects in the agrarian structure. Land reforms constitute an important component of the overall programme of agrarian development including modification in rural credit, land division, land taxation, marketing facilities, co-operative organization, agricultural education and advisory services. Land reforms aim at providing greater equity in income and wealth. Following the directives from the National Government, Government of Karnataka also introduced land reform legislation and modified them from time to time. Land reforms involved the following components:

- (i) Abolition of intermediaries
- (ii) Ceiling on land holdings

- (iii) Land redistribution
- (iv) Tenancy reforms which include: (a) regulation of rent, (b) security of tenure for tenants and (c) conferment of ownership on them
- (v) Agrarian reorganisation including consolidation of holdings and prevention of sub-division and fragmentation; and
- (vi) Organisation of co-operative farms

The main objectives of land reforms are to achieve greater equality and efficiency in use of resources (Govt of Karnataka 1993). Karnataka's Land Reform policy was developed with the twin objectives of (i) conferring ownership on erstwhile tenants and (ii) redistribution of surplus lands available after land ceiling to the deserving. This policy has relatively achieved its objective by fixing a ceiling on land holdings and conferring ownership to tenants. Up to the latest amendment in 1995, land reforms did not promote land lease. The purpose of land reforms was to make more rational use of the scarce land resource by affecting condition on holdings, imposing ceilings on holdings so that cultivation can be done in the most efficient manner without any waste of labour and capital. It is a means of redistributing agricultural land in favour of the less privileged classes and of improving the terms and conditions on which land is held for cultivation by the actual tillers, with a view to ending exploitation (Aziz and Krishna 1997).

Land reforms in Karnataka are considered to the better-implemented reforms as compared with those in many other states in the country not only by analysts from Karnataka but by others also (Sinha and Pushpendra 2000). The reforms in Karnataka are certainly pragmatic in their content but the process of implementation leaves a large area unattended to. The major achievements include the acquisition of surplus land, abolition of intermediaries and abolition of tenancy, at least the recorded old tenancy. The main failures listed by the analysts in the context of reforms are the distribution of surplus land, the quality of the surplus land, economic viability of the distributed land and conduction of check on concealed tenancy (Thimmaiah and Aziz, 1984). Among the major failures of land reforms, concealed tenancy, reverse tenancy and marginalisation of holdings are the most important ones. Land going out of agricultural sector for non-agricultural uses and interestingly the other sectors have no land ceilings.

There are a few interesting observations, which emerge out of the broad trends shown in table 1. Marginalisation of land holdings is occurring very fast and this may result in bringing down the viability of small and marginal farms (Aziz and Krishna 1997). With this pace of marginalisation of land holdings, it is feared that a large number of small and marginal farmers are likely to go out of business, swelling the ranks of the urban poor. The area under large and medium farms is fast decreasing, though this has not shown any significant effect on the

production probably due to inverse size-productivity relationship. However, this it is likely to be problematic in future in the context of the fast changes that are taking place in the agricultural sector. In Karnataka, the number of holdings operated by different size groups are; 26.10 lakh marginal, 17.07 lakh small, 12.04 lakh semi medium, 5.94 lakh medium and 1.06 lakh large holdings. The land concentration is 0.685 as against the all India level of 0.713. The average size of holdings is 1.95 ha and the number of holdings with land less than 1.0 ha accounts for the maximum share of 42% of the total holdings in the State, which in itself is cause for concern. The ceiling limit on land holdings in Karnataka is 4.05-8.10 ha for irrigated land with two crops, 10.12-12.14 ha for irrigated land with one crop and 21.85 ha for dry land.

Table 1: Trends in Land Holdings in Karnataka 1970-1990

(Area under holdings in 000 ha)

Sl. No	Size Class	1970-71	1976-77	1980-81	1985-86	1990-91	1995-96
1	Marginal	549	638 (16.2)	733 (14.9)	866 (18.2)	1,072 (23.7)	1,248 (16.4)
2	Small	1,221	1,319 (8.0)	1,543 (17.0)	1,888 (22.4)	2,308 (22.2)	2,480 (22.3)
3	Semi-Medium	2,205	2,288 (3.7)	2,572 (12.5)	2,880 (11.9)	3,200 (11.2)	3298 (11.1)
4	Medium	3,792	3,858 (1.7)	4,018 (4.1)	3,881 (-3.4)	3,770 (-2.9)	3,489 (-7.45)
5	Large	3601	3,254 (-9.6)	2,880 (-11.5)	2,364 (-17.9)	1,971 (-16.6)	1,593 (-16.6)
6	Total	11,368	11,357 (-0.01)	11,746 (3.4)	11,879 (1.1)	12,321 (3.7)	12,109 (-1.7)

Source: Agricultural Censuses of Karnataka for the respective years.

Note: Figures in brackets are percentage increase/decrease over previous censuses.

The Karnataka Land Reforms Amendment Bill 1995 has brought about major change in agrarian relationship in the following areas.

1. Allows lease of agriculture land for aquaculture for a period of 20 years in the districts of Dakshina Kannada and Uttara Kannada up to 40 units (around 220 acres).
2. Agricultural land can be bought or inherited by any one whose income from non agricultural source is below Rs. 2 lakh
3. Up to 108-acre of agricultural land can be bought for industrial development purpose.
4. Up to 28 acres can be bought for educational institutions
5. Up to 54 acres can be bought for places of worship

6. Up to 54 acres can be bought for housing projects
7. Up to 108 acres can be bought for horticulture including floriculture and agro based industries

After this amendment, Government has permitted leasing out land up to 40 standard acres for aquaculture, 20 standard acres for industrial development, 4 standard acres for educational institutions recognised by the State, 20 standard acres for housing projects; and 20 standard acres for horticulture including floriculture and agro-based industries. This policy has brought about changes in land use especially in the urban fringes and in semi-urban areas, where absentee landlords are promoting floriculture/horticulture. In fact, instead of leasing out land, farmers have resorted to total sale of their land, and this in many case has resulted in farmers becoming tenants (or even wage labourers) on their own land, due to poor portfolio management. The probable implications of the changes in land policy of the earlier vintage and with the 1995 amendments are summarised in Table 2.

Table 2. Land Reforms Implications and Likely Changes

Sl. No.	Land Reform Measure	Implications and Likely Changes
1	Abolition of intermediaries	Successful but this is likely to re-emerge in other forms
2	Abolition of tenancy	Partially successful. Gave rise to un-recorded tenancy and reverse tenancy. Land tenancy market will have to be opened up
3	Ceiling on land holdings	Partially successful but unlikely to sustain in near future
4	Agrarian reorganisation including consolidation of holdings and prevention of sub-division and fragmentation; and	Consolidation of holding either through state efforts or by co-operation likely to emerge strongly.
Proposed Changes		
1	Organisation of co-operative farms	Small and marginal farmers are likely to form consortiums not in the co-operatives way
2	Increased ceiling limit for specific purposes (educational institutions, industries, housing, horticulture)	Land concentration in the hands of resourceful individuals is likely to increase.
3	Widening the definition of agriculture	Misuse of the provision is more likely
4	Allowing non agriculturists to hold land	This was happening earlier. Land concentration is likely to change.

The main purpose of the amendment is to supplement the objectives of the new agricultural policies of the Government of Karnataka and augmenting the process of liberalisation and globalisation initiated by the Government of India. Karnataka State, on the policy front, is getting into the process of liberalisation in a big way and the state has initiated a good number of interventions to boost these. However, the inter-sectoral competition in the land-use still needs to be critically looked into and analysed rationally.

Soil degradation is a serious problem in the State and we have about 77 lakh ha in the degraded land category, out of which a large portion falls in the command areas. Different sources quote varying figures about degraded land. However one common feature emerging out of these data is that the land is being degraded at a faster rate in the command areas due to violation of the cropping pattern recommended by the Command Areas Authorities. We can see from Table 3 that land erosion due to water amounts to about 58 lakh ha and this is the highest kind of degradation faced in the State. Among the command areas, Tungabhadra Command Area has the highest area affected by water logging, salinity, alkalinity etc. (see Annexure, Table 1). All this is due to violating the norms provided by land use policy instruments.

Table 3: Land Degraded under Command Areas in Karnataka

(Area in lakh ha)

Sl No	Command Areas	Areas Affected by Water Logging, Salinity and Alkalinity
1	Kabini	5834
2	Harangi	738
3	Hemavathi	1882
4	Krishnaraja Sagar	8101
5	Upper Krishna Stage I	19445
6	Bhadra Reservoir Tunga Anicut Malaprabha/Ghataprabha	12358
7	Malaprabha	3713
8	Ghataprabha, Stages I and II	4893
9	Ghataprabha, Stage III	4893
10	Tungabhadra	53415

Source: Government of Karnataka (1993). Shri T R Satish Chandran Committee Report.

Changing Trends in Land Use

Land regulatory institutions not only make an impact on the ownership patterns but also have a lasting effect on land use. Regulatory institutions create incentives or disincentives for different categories and in the final analysis the land-use undergoes change. Trends in land-use categories thus indicate the impact of institutions among various other factors on changes in land use. Growth pattern for different land use categories is analysed here at State and District level using time series data covering a span of forty years (1955–56 to 1995–96). The secondary data available with Directorate of Economics and Statistics, Govt of Karnataka, provided distribution of total area (geographical/reporting) into nine-fold land classification. No doubt, it is appropriate to study the trends in different land use category at agro-climatic zonal level to draw more meaningful micro plans. But as data on land use are not readily available at the level of agro climatic zones (Data on zones are not feasible as zones cut the district boundaries and time series data at taluka level are not easily available). Keeping this limitation in view, in the present study, the district has been chosen as unit to analyse the growth in different land use categories at desegregated level.

Analysis of land use at state level indicates that lands classified under net-sown area, under forests and under non-agriculture uses have registered positive and significant growth rates of the magnitude of 0.12, 0.42 and 1.28% per annum respectively (1955–56 to 1995–96). Surprisingly, the land classified as Current Fallow has also registered a positive and significant growth of the order of 1.04% per annum. This is a disturbing trend. The area gained by first three categories of land use mentioned above have been contributed by Permanent Pastures, Other Grazing Lands, Cultivable Waste, Other Fallow, Land under Miscellaneous Tree Crops and Groves not included under Net Sown Area, and Barren and Uncultivable Waste. These land-use categories have registered negative and significant decline during the reference period (GoK 2001). These are the two major observations that one obtains from the aggregate level analysis.

District wise analysis of growth in land-use under the nine-fold category has been undertaken to capture growth at the desegregated level. In respect of area under forest, six districts, namely, Shimoga, Hassan, Bidar, Gulbarga, Raichur and Mandya have registered positive growth rates of more than one per cent per annum (see Annexure, Tables 2 to 5). On the other hand, in four districts (Chitradurga, Chikmagalur, Mysore and Dharwar), area under forests has registered positive growth rates. In these districts, the area under forests is growing at the rate of less than one percent per annum. In seven districts, namely Bangalore, Kolar, Tumkur, Dakshina Kannada, Kodagu, Belgaum and Bijapur, there is no significant growth in area under forest. Interestingly, Uttara Kannada

which has nearly 80 per cent of its land under forests and Bellary which has only 13 percent total land under forests, have registered negative rates of growth (see Annexure tables). This tracking of the problem should help in the policy formulation process.

Land classified under barren and uncultivated (B&U) wasteland is growing at more than one percent per annum in Bangalore, Kolar and Hassan districts. In the districts of Mandya, Bijapur, Uttara Kannada, Bellary and Gulbarga, B&U wastelands are growing at the rate of less than one percent per annum which is not necessarily encouraging. Area under this category of land is declining in Shimoga, Chikmagalur, Mysore, Belgaum, Dharwar, and Raichur districts. In the districts of Chitradurga, Tumkur, Dakshina Kannada, Kodagu and Bidar, this category of land did not show any significant growth rates (see Annexure tables).

As many as nine districts have recorded positive and significant growth rates of more than one percent per annum in respect of Land Put to Non Agricultural Uses, which for the other five districts is increasing at the rate of less than one percent per annum. Only in three districts, namely, Shimoga, Uttara Kannada and Bidar these growth rates are not statistically significant. Thus, this trend reflects the fact that area put to non-agricultural purposes is increasing at a fast rate in most of the districts in the state. With respect to area under Cultivable Waste, Bidar district has registered a growth of more than one percent per annum and the remaining eighteen districts have registered either non significant or negative rates of growth. A similar trend is observed in respect of land under permanent pasture & other grazing, where Uttara Kannada District alone has registered positive growth of more than one percent per annum and all the other districts other than Kodagu which has non-significant growth rate. Land under Misc. tree crops which is not included in Net Sown Area has shown positive and significant growth in Bangalore, Chikmagalur, Mandya, Mysore, Belgaum, Uttara Kannada, Bidar, Raichur, Chitradurga, Kolar and Bellary districts. Area under this category of land shows negative growth in Shimoga, Tumkur, Dakshina Kannada, Kodagu, Bijapur, Dharwar and Gulbarga districts. Only Hassan district does not register significant rate of growth (see Annexure tables). This is an indication of cultivators shifting towards perennial crops or the preference to seasonal crops is diminishing significantly.

Area brought under cultivation has positive growth rate in as many as twelve districts, viz. Bangalore, Chikmagalur, Kodagu (growth rate is more than one percent per annum), Chitradurga, Kolar, Shimoga, Tumkur, Dakshina Kannada, Hassan, Mandya, Mysore and Bidar. This is evident from the fact that Net Area Sown has shown an increasing trend in these districts. Interestingly, Net Sown Area has registered negative growth rates in Belgaum, Bijapur, Dharwar, Uttara Kannada, Gulbarga and Raichur districts, whereas Bellary district has non-significant trend in respect of area brought under cultivation.

Land classified under Current Fallow indicates that the land has not been cultivated during the reference year. Growth in area under Current Fallow is more than one percent per annum in Bangalore, Kodagu, Mysore, Belgaum, Bijapur, Dharwar, Uttara Kannada and Bellary districts and less than one percent per annum in case of Mandya District. This phenomenon has three different explanations. First, larger portion of land is left fallow in districts which are moving towards commercial agriculture or plantation crop economy. This is resorted in order to concentrate resources on smaller portions of land. Second, rain-fed districts also show such tendency due to their dependence on the monsoon. Finally, increasing trends towards urbanisation also leads to such reaction by the decision-maker. On the other hand, Chikmagalur, Dakshina Kannada, Hassan and Bidar districts have registered negative significant growth in area under Current Fallow. The resource-constrained districts of Chitradurga, Kolar and Tumkur did not show any trend. Land under Other Fallow indicates that these lands were not brought under the plough for more than one year but they have not out of cultivation for more than three years. Nearly 13 districts, have registered either negative or non-significant growth in area under Other Fallow, while six districts, namely Bangalore, Kolar, Dakshina Kannada, Mandya, Gulbarga and Raichur have registered growth of more than one percent per annum.

Towards a Land Use Policy

Unlike capital, land is neither an abundant nor an easily regenerating resource. Limits to its use and setting-in of degradation can be easily visualised. More than that, land is a resource, that is subject to economic and environmental degradation at a large rate. At the same time, the process of reclamation of land is not only very expensive but also requires long durations of time. Therefore, its distribution among the user-categories and optimum economic efficiency in its use through policy intervention assumes prime importance.

Any land-use policy should broadly address the following objectives

- (i) Prevent further deterioration of land resource by appropriate preventive measures,
- (ii) Restore the productivity of degraded lands by adopting appropriate package of practices and technology,
- (iii) Meet the consumption needs of the growing population.
- (iv) Allocate land for different uses based on land capability, economic and environmental efficiency.
- (v) Install efficient and effective administrative structure for prescribing, regulating and monitoring land use by all concerned.

One of the major limitations of the implementation of land use policy in India is the lack of a resource-based system approach and non-recognition of the integrated inter-linkages between different uses of land. Operational plans for any individual land-use category are quite often pursued independently by the concerned departments without any horizontal co-ordination. These target-oriented operational programmes are bound to use the infrastructure and other services inefficiently and over the years have resulted in wearing out of the quality of land. In such case, a medium/long term perspective on land use becomes a prerequisite.

Perspective planning for land use requires full assessment of the present status, the likely impact of the historical, existing and intended policy interventions, and the State level constraints that are likely to emerge in implementing such perspectives. Therefore, while formulating the medium-term perspective it is essential to assemble the long-term trends in land use, the earlier processes of policy framework identified constraints in land use and major structural determinants of land use.

A perspective plan of land use in the state can therefore include the following:

- (i) It should be attempted at two levels namely at broad state level as well as at the district level.*
- (ii) It should aim to integrate agriculture with the allied sectors of the economy. Integrate forest management with agro-industries by restructuring forest policy and redefining its social relevance, economic objectives, and environmental goals.*
- (iii) Redefine social objectives of land policy. These should reduce incentives for agricultural land ownership as a tax shelter for the rich and as a way of subsistence living for the rural poor. Taxation of agricultural income, land tax to promote productive use of land, free freights on forestland can be used to promote economic as well as environmental gains to the nation. Monitoring land-use and taxation of land should be the responsibility of the local level institutions.*
- (iv) State level land use boards can play promotional and facilitating roles in institutional infrastructure and technology development, extension, and effective post-harvest administration.*

The above exercise is required not only to evolve a medium-term plan but also to direct policy tools towards problems that are likely to hinder such plans. Therefore, as a first step it is essential to begin on two fronts viz. (i). assembling of policy changes in the land-use sector and (ii) analysing the long-term trends in the policy. This will involve collecting and collating the changes in the policy that directly or indirectly affect land-use. Land-use projections for Karnataka based on growth rates in

the past as well as on carrying capacity have been worked out and are presented in Annexure Tables 6 and 7.

Towards a Policy and Monitoring Framework

(a) Policy for Arable Areas

- (i) The watershed development programme should be implemented in three phases namely resource conservation, resource development and resource utilisation with human interface. The programme should ensure farmers' participation in development activities, including its financial components.
- (ii) Environmental protection laws which relate to acts such as felling of trees should be made more stringent and the planting of the appropriate species on land should be supported by incentives in favour of growing the recommended crop or trees and disincentives for departures from recommended land use. Such a package of incentives and disincentives should be carefully worked out.

Institutional Requirements for Policy and Monitoring

- (i) The State Land-Use Board is recognised as an agency but does not function as a co-ordinating and supervising agency of the State Government for ensuring land resources management, development, and conservation. It is necessary to correct this shortcoming. It should have technical and managerial staff of proven ability to prepare annual action plans for training of extension personnel and co-ordinating the activities of different departments in the implementation of the action plan for agricultural development. It should also function as a regional resource centre for the production management information system (PMIS) at the state level.
- (ii) The classification and maintenance of land records of rights should be given high priority and land records should be constructed before any field-level investment planning is taken up in the micro-watersheds. Bhoomi programme of Karnataka State has covered significant ground in this direction. Land-use planning recognises the capability of land for alternative uses, but the social benefit-cost calculations vary depending on the ownership. For this reason, a clear demarcation of biosphere reserves, forests that give sufficient yield of non-timber forest produce, community lands, the urban green belt and private land needs to be done on a priority basis.

- (iii) For effective land use, capability classification under the FAO system of land evaluation has to be preferred over the USDA system. Land-use survey organisation should be decentralised to district or even taluk level to suggest most appropriate land use and a data card maintained for each holding.
- (iv) The solution to this problem is to decentralise land revenue administration and allocate social development programmes like drinking water, primary education, and health care to a constitutional self-government closer to the people. For this purpose, the proposed constitutional amendment on Panchayat Raj should ensure adequate financial autonomy and the adequate law and order machinery that must go with it if it is to function effectively as a constitutional third tier of government for micro-ecology development through land-use planning.
- (v) Land-use decisions have strong linkages across sectors. Therefore, the policy has to take into account the needs across sectors and present an integrated view of agricultural land use policy with other sectors. Forest policy has to be integrated with agro-industries also needs to be connected with the agricultural sector. The economic objectives and social relevance of these policies have to be kept in view.
- (vi) The concept of land reforms may have to be reviewed in line with the concepts of the new economic policy. Although abolition of tenancy has been the ideal of many land reform movements, it is debatable whether tenancy can ever be entirely abolished even if the man-land ratio in agriculture is favourable for its abolition. A variety of circumstances may necessitate its continuance to some extent in all situations. Even if redistribution of land is carried out, every rural family cannot possibly be given a piece of land sufficient to provide even subsistence. In the short run, the only realistic course of policy is to recognise the inevitability of some tenancy and to legalise and promote the most productivity oriented form of this tenancy, and not attempt to outlaw it. Empirical research is required to determine the precise manners in which alternative tenancy arrangements affect input use and productivity.

Annexures

Annexure Table 1: Soil Degradation Status of Karnataka

Kind of degradation	Degree of degradation				Total Area
	Slight	Moderate	Strong	Extreme	
Water erosion	661* (3.4)**	3675 (19.2)	139 (0.7)	1393 (7.3)	5868 (30.6)
Nutrient loss	-	-	600 (3.1)	30 (0.2)	630 (3.3)
Salinity	-	100 (0.5)	-	-	100 (0.5)
Sodicity	-	-	10 (0.1)	-	10 (0.1)
Water erosion + Compaction & crusting	420 (2.2)	472 (2.5)	-	49 (9.2)	941 (4.9)
Water erosion + Nutrient loss	55 (0.3)	47 (0.2)	30 (0.1)	-	132 (0.6)
Total					7681 (40%)

Note: * Figures indicate degraded area in '000 ha
 ** Figures in parentheses indicate percentage of TGA

Source: Government of Karnataka (2001). *Perspective Land Use Plan for Karnataka – 2025*, State Land Use Board, Bangalore.

Annexure Table 2: Land Utilisation – Compound Growth Rate – 1955-56 TO 1995-96 – Bangalore Division

Land-use	Bangalore		Chitradurga		Kolar		Shimoga		Tumkur	
	G.Rate	R ⁻²	G.Rate	R ⁻²	G.Rate	R ⁻²	G.Rate	R ⁻²	G.Rate	R ⁻²
Forest	0.63 NS	0.04	0.15*	0.22	0.001 NS	NEG	2.82*	0.89	-0.03 NS	0.02
Barren and uncultivable waste	1.32*	0.40	-0.23 NS	0.03	1.34*	0.73	-2.87*	0.59	0.25 NS	0.06
Land put to non-agricultural uses	2.04*	0.80	0.29*	0.36	0.77*	0.82	0.01 NS	0.01	0.50*	0.26
Cultivable waste	-2.03*	0.83	-1.48*	0.31	-0.61*	0.20	-3.44*	0.76	0.16 NS	0.01
Permanent pasture and other grazing land	-2.29*	0.56	-1.39*	0.85	-1.92*	0.94	-1.01*	0.60	-1.75*	0.80
Land under misc. tree	4.02*	0.70	0.81*	0.75	0.94*	0.46	-3.28*	0.50	-7.22 *	0.79
Crops and groves not included in net area sown:										
Current fallow	2.46*	0.65	-0.24NS	0.004	0.01 NS	NEG	-1.52 NS	0.04	0.12 NS	NEG
Other fallow	2.64*	0.23	-3.62*	0.75	1.06*	0.14	-0.58 NS	0.04	-0.91*	0.25
Net area sown	1.21*	0.14	0.53*	0.21	1.06*	0.71	0.71*	0.87	0.53*	0.60

Note: * Statistically significant at 10 percent level, Based on Land Use Data,
 Directorate of Economics and Statistics, Govt. of Karnataka, Bangalore
 NS: Not significant
 NEG: Negligible

Annexure Table 3: Land Utilisation -Compound Growth Rate-1955-56 TO 1995-96 - Belgaum Division

Land-use	Belgaum		Bijapur		Dharwar		U. Kannada	
	G.Rate	R ²	G.Rate	R ²	G.Rate	R ²	G.Rate	R ²
Forest	0.26 NS	0.01	-0.01 NS	0.03	0.13*	0.31	-0.02*	0.55
Barren and uncultivable waste	-1.09*	0.59	0.63*	0.25	-2.85*	0.82	0.91*	0.45
Land put to non-agricultural uses	9.25*	0.72	1.31*	0.68	6.23*	0.88	-0.17NS	0.02
Cultivable waste	-1.73*	0.66	-1.18*	0.61	-1.68*	0.58	-2.77*	0.98
Permanent pasture and other grazing land	-1.72*	0.84	-2.12*	0.55	-1.68*	0.46	10.50*	0.68
Land under misc.tree crops and groves not included in net area sown.	3.01*	0.26	-1.17*	0.21	-3.32*	0.65	1.50*	0.56
Current fallow	4.28*	0.67	3.81*	0.540	4.83*	0.65	3.90*	0.70
Other fallow	-5.58*	0.92	-0.62NS	0.06	-1.79*	0.43	-1.18*	0.64
Net area sown	-0.12*	0.37	-0.25*	0.34	-0.13*	0.20	-0.15*	0.13

Note: * Statistically significant at 10 percent level, Based on Land Use Data, Directorate of Economics and Statistics, Govt. of Karnataka, Bangalore
NS: Not significant

Annexure Table 4: Land Utilisation -Compound Growth Rate-1955-56 TO 1995-96 - Mysore Division

Land-use	Chikmagalur		D.Kannada		Hassan		Kodagu		Mandya		Mysore	
	G.Rate	R ⁻²	G.Rate	R ⁻²	G.Rate	R ⁻²	G.Rate	R ⁻²	G.Rate	R ⁻²	G.Rate	R ⁻²
Forest	0.89*	0.82	0.09 NS	0.07	2.71*	0.76	-0.04 NS	0.04	1.98*	0.33	0.28*	0.90
Barren and uncultivable waste	-1.38*	0.75	-0.14 NS	0.05	1.25*	0.88	-0.05 NS	0.07	0.79*	0.38	-0.77*	0.44
Land put to non agricultural uses	1.50*	0.79	1.25*	0.91	1.29*	0.79	0.68*	0.65	1.91*	0.81	1.86*	0.74
Cultivable waste	-1.35*	0.72	0.04 NS	NEG	-1.26*	0.60	-4.89*	0.95	-0.50 NS	0.07	-1.01*	0.66
Permanent pasture and grazing land	-1.90*	0.96	-0.25*	0.46	-3.20*	0.95	-0.76 NS	0.03	-2.13*	0.88	-1.78*	0.56
Land under misc.tree	2.76*	0.61	-0.91*	0.83	-0.03 NS	0.01	-0.19*	0.15	1.98*	0.16	1.03*	0.15
Crops and groves not included in net area sown.												
Current fallow	-3.78*	0.71	-2.73*	0.83	-3.40*	0.62	5.24*	0.55	0.22 NS	NEG	2.74*	0.37
Other fallow	-2.30*	0.57	1.17*	0.18	0.80 NS	0.03	-2.83*	0.3	3.98*	0.52	0.35 NS	0.03
Net area sown	1.16*	0.95	0.43*	0.43	0.94*	0.89	1.56*	0.84	0.28*	0.27	0.66*	0.85

Note: * Statistically significant at 10 percent level, Based on Land Use Data, Directorate of Economics and Statistics, Govt. of Karnataka, Bangalore
 NS : Not significant
 NEG: Negligible

Annexure Table 5: Land Utilisation -Compound Growth Rate-1955-56 TO 1995-96 - Gulbarga Division

Land-use	Bellary		Bidar		Gulbarga		Raichur		State	
	G.Rate	R ²	G.Rate	R ²	G.Rate	R ²	G.Rate	R ²	G.Rate	R ²
Forest	-0.83*	0.64	5.15*	0.92	2.17*	0.56	4.88*	0.81	0.42*	0.91
Barren and	0.22*	0.35	0.97 NS	0.08	0.38*	0.12	-2.55*	0.86	-0.35*	0.75
Uncultivable waste Land put to non agricultural uses	0.16*	0.32	0.01 NS	NEG	1.34*	0.81	1.34*	0.72	1.28*	0.97
Cultivable waste	-0.45NS	0.04	1.08*	0.25	-3.26*	0.90	-0.50*	0.15	-1.24*	0.93
Permanent pasture and other grazing land	-0.94*	0.12	-1.79*	0.63	-0.81*	0.51	-0.82*	0.72	-1.64*	0.93
Land under misc.tree Crops and groves not included in net area sown.	0.31*	0.11	2.41*	0.20	-3.32*	0.5	1.98*	0.34	-0.40*	0.45
Current fallow	1.71*	0.20	-1.37*	0.240	1.37*	0.13	2.05*	0.36	1.04*	0.35
Other fallow	-2.85*	0.50	-0.85*	0.14	2.89*	0.16	3.21*	0.27	-0.84*	0.3
Net area sown	-0.11 NS	0.05	0.11*	0.15	-0.20*	0.16	-0.33*	0.65	0.12*	0.24

Note: * Statistically significant at 10 percent level, Based on Land Use Data,
Directorate of Economics and Statistics, Govt. of Karnataka, Bangalore

NS : Not significant

NEG: Negligible

Annexure Table 6: Land Use Projections for Karnataka

(Area in hectares)

Particulars	Year				
	2000	2005	2010	2015	2020
Total geographical area	19187919	19187919	19187919	19187919	19187919
Forests	3282592	3330082	3365144	3432520	3482059
Barren and uncultivable land	718310 3.7	705827 3.7	693561 3.6	631509 3.3	619665 3.2
Land put to non agri. use	1531808 8.0	1632386 8.5	1739567 9.1	1803787 9.4	1925505 10.0
Cultivable waste	368745 1.9	301320 1.6	230071 1.2	260108 1.4	241352 1.3
Permanent pastures and Other grazing land	812555 4.2	698076 3.6	588713 3.1	584060 3.0	533745 2.8
Land under miscellaneous Free non-crops included N.S.A	310425 1.6	304266 1.6	298230 1.6	242312 1.3	236513 1.2
Current fallow	1076775 5.6	1108944 5.8	1144148 6.0	1057549 5.5	924316 4.8
Other fallow land	451662 2.4	408009 2.1	365125 1.9	347980 1.8	331544 1.7
Net sown area	10635047 55.4	10699010 55.8	10763359 56.1	10828094 56.4	10893219 56.8

Note: Figures are in hectares and those in the second row are percentages to the total geographical area.

Annexure Table 7: Projected Land Use Based On Carrying Capacity of Land During 1991

(Area in hectares)

Category of land use	Year			
	2000	2005	2010	2015
Forest	3559201	3786984	4029306	4244219
Land put to non-agriculture use	1379330	1467605	1561514	1644801
Net sown area	12395607	13188905	14032840	14781314
Area under foodgrains	8470853	9012975	9589699	10101187
Area under non-foodgrains	3924754	4175930	4443141	4680127
Area to be double cropped	1760560	2489895	3269481	3953220

Note

- 1 Agrarian structure refers to the manner in which man-land relationships are governed and covers the way in which land is held and cultivated. In addition to this, it also covers the rights and privileges enjoyed by different categories of people who have access to land.

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