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**Promoting Land Development in India and China:
Imperatives for Institutional Changes**

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Abstract

Development of land and water resources has played an important role in raising and sustaining farm productivity right from the early phase of development in People's Republic of China. These measures, known as Farmland Capital Constructions (FLCs), have generally assumed special significance in China vis-à-vis India, partly because of the relative scarcity of land in the former. However, the major driving force for promoting FLC, was utilization of surplus labour, which formed a major source of capital formation in rural economy. Hence, FLC in China was seen as a critical pre-condition for improving farm productivity right since the early fifties. Compared to this, Soil Water Conservation (SWC) programmes in India had received little importance till mid-eighties when Integrated Watershed Development Programmes (WDPs) were recognized as a critical policy intervention, especially for dry land regions. But, the crucial difference between the two lies in the fact that, for long, the SWC programmes were undertaken mainly as relief work or employment generation activities, with little concern for improving farm productivity in a given time frame.

To a large extent this was due to the differences in the agrarian structure, which govern the ownership as well as actual control over land and water resources. In China it is the state or people's collectives, which owned and controlled these resources where as the ownership to a large extent, is vested with individual households. As a result, a strong organizational structure was built-up for managing the FLC activities in China, which subsequently got linked up with the targets for food grain production at the national level. In India the SWC measures, especially on the privately owned cropland, has been largely governed by market-determined incentives, and at times, also by the state's subsidies. While this did help in expanding the area under cultivation in the initial phase i.e. till early seventies, the SWC programme, subsequently got relegated to the welfare-induced relief works programmes often carried out in an adhoc manner because of the resource crunch. Consequently, their impact on asset creation and crop production might have been somewhat limited as compared to China.

The collective system, in the post reforms period however, has undergone substantial changes seeking more of private controls and incentives to sustain the investment on land. At the same time private ownership of land and water resources in India has led to over exploitation, especially of ground water and thereby neglecting some of the important measures for SWC. Ironically therefore, degradation of natural resources in China is caused due to lack of appropriate private incentives, whereas in India, degradation is caused by

absence of collective institutions. As a logical corollary, China is now trying to 'decollectivise' the use of land whereas India is striving for a participatory mechanism.

This paper compares the experiences in India and China and draws lessons for policy formulation. The important lessons are: (a) self-financing nature of FLC/SWC is a crucial factor for achieving effective results; (b) while private incentives are important, the state ought to exercise certain control over the use of land and water, which essentially are contiguous resources; and (c) conservation of these resources alone is not sufficient; it should be systematically linked with the macro level targets for enhancing crop productivity.

JEL Classification s: Q15, Q18 and N14

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I. INTRODUCTION

Land development through various soil and water conservation measures is a basic investment, essential for sustaining productivity of cropland, especially in dry land regions. Several traditional methods have been developed and practiced in India and China both having a long history of crop cultivation. However, many of these traditional practices were grossly neglected during the pre-independence period when agrarian relations in these countries were dominated by strong feudal characteristics. Hence, at the time of the independence, both countries had recognized the urgency of land reforms, which in turn, were expected to enhance investment on land. The urgency for such investments however was more acute in China because of the relatively stronger feudal structure and the resultant severe degradation of land that had taken place before China became a socialist republic. Compared to this, India had relatively favourable crop land: man ratio and at the same time, had diverse agrarian system providing relatively better incentives for farmers to invest in the land which they tilled. In spite of these differences, both India and China pursued a policy of promoting land development through various measures like consolidation of holdings, expansion of irrigation and checking of soil erosion. But the mechanisms through which these policies were pursued were quite different owing to the stark difference in the political system adopted by the two countries. In India, the focus was on individual incentives through credit and market support, in China the focus was on promoting centrally controlled collective institutions.

Since then, significant efforts have been made in both countries to develop crop land through various physical measures like irrigation and soil-water conservation (SWC) more recently known as watershed development programmes (WDPs) in India; and farmland capital construction (FLC) & water conservancy programmes in

China. Subsequently, thousands of hectares of land have been leveled and shaped along with a significant increase in irrigation potential covering about 28 and 48 per cent of the cultivated land in India and China respectively. With these, the two countries have also succeeded in attaining technological transformation through 'Green Revolution', which led to self-sufficiency in food production at least at the macro level. Of course there is an important distinction i.e. China unlike India, has also ensured food security at household level where India is significantly lagging behind.

At the turn of the 21st century however, both countries have been facing large-scale degradation of land though, with varying levels of input use and the associated levels of crop yields. China with almost double the rate of fertiliser (chemical) use and with more extensive irrigation has achieved yield levels that are more than double that of India. Despite these differences, the two countries are facing the difficulties in extending this yield growth to the dryland/rainfed regions unless, significant investment are made once again in the form of SWC/FLC. While both the countries have recognized the need for such measures, the institutional mechanisms developed therein are diagonally opposite to each other. But, this time the direction of institutional change sought in the two countries is quite different as compared to the initial phase. For instance, India is facing the problem of scattered and non-economic land holdings with almost total absence of collective organisations to develop land and water resources on a community basis. Contrary to this, China is facing a problem (despite the presence of community organisations) because of inadequate private incentives to look after the community land and water resources. Thus, both countries are facing significant institutional constraints for promoting investment in land development. Evolving these institutions, *prima facie*, is difficult because the link between farmland development and productivity related incentives is often complex and uncertain. Also, there is a critical interdependence between development of public and private land. What is therefore needed is a balance between community and individual incentives to take care of the resources under both private as well as public ownership/use in an integrated manner.

It is in this context, this paper examines experiences in India and China with respect to land development and the role played by the institutional mechanism under the changing policy environment in the two countries. The idea is to understand what kind of incentive structures as well as regulations are likely to work under each system. It is hoped that a comparative analysis on this crucial aspect will bring out some important lessons for promoting investment in land development, a critical precondition for sustaining food grains production in the long run. This is important especially, in the context of the large segment of dry land agriculture, which constitutes 51 and 67 per cent of the gross cultivated area in China and India respectively (Table 1).

II. LAND DEVELOPMENT IN CHINA AND INDIA: INITIAL CONDITIONS

While land development has been considered very important for increasing farm productivity both in India and China the approaches adopted by the two countries has been fairly divergent. Besides the basic difference in the political system, the approaches also reflect differences in the initial conditions obtained in the two countries at the time of their independence. Table 2 provides a comparative picture of some of the important indicators for India and China during the mid-fifties. Following observations bear special significance.

First, China not only had smaller area under crop per capita, it had relatively higher level of the base-yield from which further growth would have been relatively more difficult to achieve. While the average growth in grain-output during 1952-57 was fairly comparable between the two countries (i.e. 3.7 per cent in China and 3.6 per cent in India), it would, indeed, have meant more efforts to achieve this growth in China because of the relatively higher level of base-yield.

Second, much of this increase in production has been achieved through area expansion though, more in the case of China vis-à-vis India. In fact, if one considers the entire period starting from 1949 to 1957 in China, the growth in grain output and area under grain crops had increased at the rate of 8.6 and 3.0 per cent respectively. The comparative figures for India during 1950-51 to 1956-57 were 5.3

and 2.0 per cent respectively. Obviously farmland capital construction would have played a more important role in China, where area expansion was more crucial than that in India.

Third, widening of the irrigation base was a key element in the strategy of increasing the area as well as production in China; between 1949 and 1957, as net irrigated area had increased from 16 to 31 million hectares. This is significantly higher as compared to India where the increase was only marginal i.e. from 20.8 million hectares in 1951-52 to 22.7 million hectares in 1955-56. Apparently, in India, the expansion of cropped area was achieved mainly by promoting farmers' own investments under the nation wide campaign of 'Grow More Food'. The strategy was to provide (a) cash subsidies on purchase of inputs; (b) credit support for developing water resources through minor irrigation; and (c) extension support. Here, the thrust was mainly on price and market support rather than on utilization of labour for capital formation.

Thus, in the initial phase of five years itself, China's net irrigated area had surpassed that of India by an absolute figure of about 8 million hectares. Nevertheless, given the favourable land population ratio, per capita production of food grains in India remained significantly higher i.e. about 431 kgs. vis-à-vis 307 in the case of China. This, once again, suggests the relative urgency for increasing grain production in China vis-à-vis in India right from the early fifties.

2.1 Farm Land Constructions in China

Farmland Capital Construction had emerged as one of the most outstanding features of the transformation of agrarian economy in the early phase of the socialist development in China. This, essentially, involved development of land and water resources through a variety of measures like clearing and shaping of land including clear felling of forests, preparing drainage and water ways for controlling of floods, rejuvenating irrigation systems, manuring and other measures for harvesting rain water etc. These measures were considered critical for improving land productivity especially, at a time when land, in small pieces, were being distributed to a large

number of peasants having hardly any resources, except their own labour, to invest on their and. Rural capital construction therefore could be directly linked with the process of capital formation¹.

Three specific features characterized this basic approach. First, farmland capital construction in China was considered as an integral part of the agrarian reforms for promoting agricultural productivity in a planned manner. Second, undertaken on a collective basis, these measures could break the scale barriers of individual farms. And third, private ownership of land ceased to exist first under the development of the Advanced Cooperatives in 1955-57 and then under the communes system. Under the later scheme, responsibility of maintenance was fixed with the respective cooperatives and/or production teams rather than with the individuals.

Regardless of these favourable conditions, there were certain potential constraints that may have exerted adverse influence on the actual outcome. For instance, during the initial phase, when incentives for individual efforts were high (due to private ownership of land), the farm economy was facing chronic shortage of resources including the basic tools as well as draught power etc. for carrying out farm operations. By the time cooperative movement got strengthened in the mid-fifties, the private incentives were withdrawn. It is therefore, plausible that the

1. Apparently, this is quite similar to public works programmes or employment guarantee schemes taken up in several developing countries including India. However, there are two basic differences between these approaches. First, there was no direct payment for the use of surplus labour in the sense of making financial provision under the Central or the State Governments. To a large extent, this was a part of the overall arrangement for ensuring basic needs of the rural households, which involved a complex mechanism of adjusting surplus and deficits. Accumulation of fund used for capital construction was often included in the consumption fund (Muquiao, Xue; 1981). To a large extent, the self-financed nature of the FLC was possible because of the second aspect of the basic approach. Full utilization of labour in itself was a political goal in the early phase of the agrarian transformation in China. It is imperative to note that this kind of 'primary accumulation' basically involved hardships, which could be acceptable only under a collectivist as opposed to individualist values (Patnaik, 1988, p.39). This in fact, is the basic thrust of the Chinese approach as different from the 'participatory approach' being widely tried out under the various natural resources management programmes in the third world, which essentially remains individualistic.

farmers' own limited efforts for soil improvement on private plots did not bear significant results. The large-scale measures for soil-water conservation might have taken some time before the actual impact on land productivity could have been realized. By the time, this gestation period (5-7 years) was completed; the production organisation was also changed from cooperatives to commune system. How far this reversal of the incentive structure could ensure requisite efforts for maintenance of the SWC-structures etc. is an important question, which needs further probing.

2.2 Soil Water Conservation in India

Using surplus labour for creating rural assets has been a fairly common feature right from the initial phase of development in India. However, in practice, such measures are being viewed as employment generation programmes rather than as basic investment, which should essentially precede other strategies for productivity enhancement through yield augmenting technologies².

Ideally, in an economic system with private ownership of land, this kind of autonomous investments should come up through private initiatives of the land owners which, at best, could be supported by the state promoted market processes.

² India offers one of the glaring examples of how public works programmes, initiated as a process of asset formation, and got turned into employment generation or relief works programme. The Community Development Programme, launched during 1952-1963 in every district in India was a fairly ambitious scheme for ensuring basic infrastructure to a large number of villages in each block. However, once completed, this programme could not be linked with direct asset formation on a continuous basis. Instead, special employment programme and rural works programmes were initiated with the main objective of providing additional employment to the landless and small/marginal farmers respectively. Unfortunately, most of these programmes were thinly spread because of the budgetary constraints and created poor quality of assets because the central thrust was on employment generation *per se* (i.e. sort of a dole), rather than productivity enhancement (Hirway and Terhal, 1995). The latter was being undertaken separately through Intensive Area/ Agriculture development programmes using substantial amount of capital funds for machinery etc. (Government of India, 1976). In China, capital construction and employment generation were almost identical.

To an extent, this was demonstrated by the initial experiences with respect to expansion of cultivated land in India. For instance, the increase in cultivated land from 119 million hectares in 1951 to 140 million hectares in 1971 was achieved mainly by developing degraded forest as well as non-forest land. Much of this development however, took place through efforts of the individual cultivators. The state support though, in limited manner, came mainly through establishment of the Land Development Banks³ with the basic mandate of providing medium and long-term credit for carrying out various measures on private land. Besides this, the government also undertook SWC work where the initial focus was mainly to check erosion in the catchments of the major irrigation projects⁴. For private land, measures like land shaping, terracing and field bunding were mainly left to the initiatives of the individual farmers since the government's efforts were fairly limited and confined mainly to relief works, which in any case is the state's responsibility. As a result, soil water conservation, including those on public land remained haphazard and subject to unplanned fire-fighting operations instead of being treated as basic investment, essential for sustaining the productivity of land.

The situation however, changed with the emergence of watershed development programmes (WDP) especially since mid-eighties⁵. The WDP-approach, unlike the earlier efforts for soil-water conservation, seeks to make requisite investments in

3. In India, the financial support from the state can be grouped into three broad categories viz; direct outlays on the provision of production requisites; (b) long term investment in irrigation and flood control; and (iii) support to the institutional development for credit, extension, cooperative organisations, R & D etc. (Singh, 1992). Land Development Bank and Land Development Corporations were instituted as a part of the support in the last group.

4. For instance, the first initiative immediately after the independence, was the river valley schemes to check soil erosion in some of the major river basins in the country. This was followed by dry land farming demonstration and survey of ravines in the II plan. Reclamation of cultural wastelands and settlement of landless agricultural labourers came to the centre/stage in the third plan i.e. during 1961-66 (Government of India, 1976; 245).

5. For details an policies and experiences of soil-water conservation in India (Shah, 1998).

land, water and forest so as to ensure livelihood support for the people dependent on these resources. Thus, instead of focusing mainly on conservation aspects, the WDP, of late, have tried to address the productivity aspects in a more comprehensive manner. In fact, the approach as of now is being viewed as the critical strategy for enhancing food grain production in dry land regions from which future growth in production will have to be realized increasingly⁶.

But, given the complex structure of ownership of land, water and forest vested with various stakeholders viz; individuals, community, local bodies, and different departments in the government, implementation of WDPs becomes somewhat difficult. Some of the features that make the implementation of WDPs more complicated are (a) it lays emphasis on conservation rather than on promoting the use of a particular natural resource/input; (b) the scientific treatments measures cut across the boundaries of individually owned farms as well as revenue villages; (c) it involves trade-offs across resources as well as individual stakeholders; (d) the resultant impact is often slow and at times non-tangible; and (e) the process is interactive and continuous hence, requires fine tuning between physical and social engineering.

To overcome these problems, watershed programmes of late, have laid increasing emphasis on flexibility, participatory processes and institutional building. NGOs, with their presumably better skills in these aspects, are being involved in the project implementation process, more than ever before. In this context, Watershed Development Project (WDP) initiated by the Ministry of Rural Areas and Employment marks a major break through because of the three important features (Turtan, C. *et al*, 1998) viz. unprecedented devolution of decision making power

⁶. Regarding the future growth in food grain production in India it has been noted "It is clear that, at the existing level of irrigation and available improved varieties, the bulk of the unexploited potential to raise crop yield is largely concentrated on unirrigated areas spread over environment with high, medium or low rainfall. The realization of this potential requires a far more sophisticated application.... In fact, resource degradation caused by inadequate attention to soil and water management seems to have contributed to sub-optimal economic efficiency of the inputs used in technology based intensification of Indian agriculture" (Desai and Vaidyanathan, 1995; pp.159).

backed up by the financial allocation directly to the district level and hence to the village organisation level; creation of partnership between Government Organisation (GO), Non-Government Organisation (NGO) and people; and flexibility in terms of technical as well as financial norms for watershed treatments.

Some of the recent experiences suggest that watershed programmes, by and large have achieved limited impact, confined mainly to the irrigation effects (Kerr, *et al* 1998). As a result, either a part of the natural resources within a watershed remains under-developed (e.g. community waste land or various moisture conservation practices for enhancing the crop yield); or funds are being utilized mainly for making high cost structures. Both these may have serious socio-economic as well as environmental implications. For instance, it may leave a large part of the local communities - both landed as well as landless outside the net of the project benefits. More so, if the project fails to initiate a process of negotiation within the village community and arrive at a mechanism of inter-dependencies and cross subsidization among different categories of stakeholders. Similarly, environmental objectives like regeneration of common property land resources and water-use efficiency remain unattended.

Not surprisingly therefore, the measures undertaken both on private as well as public land are found to be poor in quality and devoid of effective efforts for maintenance. Of course, it may be noted that India is not a unique case in this respect⁷. Such experiences are largely shared among a number of countries in Africa where SWC work had been undertaken on a larger scale. Observations from most parts of the developing economies thus suggest that despite the massive efforts for soil moisture conservation the outcome has been quite dismal; bunds have been broken and vegetation never survived. Also, there are enough evidence that because of the poor maintenance, these measures have increased, rather than reduced, soil erosion [Shah, 1998].

⁷. Various studies pertaining to soil water conservation in Africa indicated "in Lesotha all the uplands were protected by buffer stripping by 1060; in Nyasaland, 1,18,000 kms. of bunds were constructed between 1945-60; and in Rhodesia half of the native land in eastern provinces was protected by contour strips by 1950" (Stocking, 1985).

III. CHANGING POLICY INITIATIVES AND OUTCOME: CHINA AND INDIA

A number of studies on Chinese agricultural growth vividly describe the success of the commune system, which led to significant achievements not only in terms of production and productivity, but also in terms of meeting the food requirements as well as containing the food consumption beyond a certain level. This resulted in creating a surplus that could be effectively invested in the other vital sectors like health, education and rural capital construction besides the high priority industrial sector. While the existing literature is quite eloquent about the approach and the achievements listed above, not much has been written on the role played by the communes system in influencing investment on farmland and its linkages with the incentives systems under its different structures and forms. The evidence, by and large, suggest that the commune system was not successful in increasing farm productivity despite its special emphasis on FLCs. This however, does not imply that FLCs did not have any significant link with productivity, for the latter is influenced, at least in the short run, by a large number of factors other than FLCs.

It is difficult to empirically ascertain a direct link between FLCs and farm productivity except in the case of water conservancy and irrigation related measures. Nevertheless, it might be important to understand the interface between the institutional arrangements and the efficacy of the FLCs. This issue is particularly relevant in the post reforms period where private incentives are being seen as a critical precondition for ensuring on-farm investments including FLCs.

Contrary to this, the policy dilemma in India is to modify the ownership structure in a manner so as to create a favourable environment for collective efforts and sharing of benefits. For, it is clearly recognized that markets may not provide right kind of signals/incentives for promoting investment as well as appropriate management of the common property resources like pastures, forests and above all water. The need therefore, is to incorporate institutions as a critical component by introducing transaction costs associated with the building and operation of institutions for watershed projects (Mills, 1999). The limited experiences in India and also elsewhere suggest that though necessary, such institutions are difficult to evolve

and sustain for long especially in an operating environment where rest of the system is by and large, driven by private ownership and rules of the market. It becomes essential therefore to redefine the role of the state in managing WDPs within a predominantly participatory mode.

In absence of a clearly defined role of the state intervention in India, the contrast between the two countries remains fairly striking. This can be highlighted by the fact that in China the investible resources - both labour as well as capital - are to be primarily contributed by community, with the state having final control over the outcome or production targets and procurement etc. However, in India, the state acts mainly as a provider of investible resources with hardly any control over the outcome and its distribution, which ideally, is left to the community. This kind of a 'responsibility-free' system does not seem to work effectively for attaining either of the two objectives viz; resource mobilization and output distribution.

Despite the basic differences in the operating environment, a recent review (Shah, 2000) of the experiences in China and India indicated certain commonalities between the two countries. Of course, in so far as the technical specifications are concerned there may not be much difference because the primary objective in both countries was to increase food grain production with the help of the limited land and water resources. What is however, surprising is that some of the outcomes also appear to be somewhat similar. For example, FLCs like several of the SWC-work in India were carried out mainly to meet the targets. Similarly, the plantation programme often had rather low survival rate. A number of other instances can be identified especially where the results were not so much encouraging. The major difficulty in making this kind of a comparative assessment however is that there are no quantitative data pertaining to the coverage, quality as well as effectiveness of these measures in both the countries. The analysis therefore, remains somewhat impressionistic, using the anecdotal evidences from the existing literature. Given these limitations, the following analysis tries to map out broad contours of the policies and the tentative outcomes in India and China.

Table 3 provides a comparative picture of some of the important aspects of FLC/SWC work over different policy regimes in the two countries. Following observations emerge.

- i. In terms of policy measures, the two countries have adopted a fairly similar approach to face the shared problems of low productivity, production-gap in food grains at macro level, absence of basic infrastructure in rural areas, scanty financial resources, and small and fragmented holdings.

Both countries started with a common programme, which included land reforms, consolidation of land, expansion of cropped land, and sharing of labour as well as other farm inputs. But, the process of divergence started very soon with China going the commune's way involving large scale farming, full utilization of surplus labour and mobilization of local resources to be diverted for rural capital construction (RCC) and FLC within the region. On the other hand, India took off on promoting private investment especially, for the cropped land. For the remaining investment, state had to assume the major responsibility. As a result, investment on SWC and rural works programmes were neglected owing to the financial resource crunch. Crucially, this constraint was overcome through labour accumulation in China.

- ii. While the primary responsibility of FLC was vested with various institutions of the local governance i.e., communes, provisions were also made for the rights of the communes to mobilize resources such that these activities could more or less become self-financed. This, in turn, would promote efficiency and also establish links with farm productivity. Moreover, the pressure of meeting the production quota would necessitate productivity orientation in FLC-work. The reason for this to not have worked effectively during large parts of the post-sixties is because of the contradictory signals coming from the leadership at higher level. For instance, the nature of production organisation during the period of Great Leap Forward as well as Cultural Revolution was going back and forth. This in turn, created confusion and at the same time, offered a substantial scope for political maneuvering at the local level. Consequently, the actual outcome of the FLCs, especially those other than irrigation, seems to have been mixed.
- iii. The factors which were primarily responsible for what, by and large, can be considered as success of FLCs in China were twofold: First, significant emphasis on mobilizing local resource - both labour as well as capital. Second and more important, is political control from the higher-level leadership. Both

these have been missing in the Indian case. As a result, the local bodies in India neither felt compelled for mobilizing the requisite resources for basic investment in land and water resources nor, were they considered finally responsible for ensuring availability of the basic infrastructure in the rural economies. Strangely, instead of ensuring financial autonomy as well as accountability of the panchayat bodies, the state in the Indian case tried to further intensify their controls by introducing special employment or relief works programmes, which had rather limited links with farm productivity. While it can be argued that the relatively large scale investment in SWC and irrigation - both public as well as private - have yielded reasonably good success, the SWC measures to be undertaken at a micro or village level, had been grossly neglected in comparison to China. This was mainly because of the lack of local finances and the institutions, which can be held accountable for such developments.

- iv. Notwithstanding these differences, both countries seem to have focused on the measures, which give positive results in terms of productivity within a short period of time. In the process, the long-term measures for soil and water conservation seem to have been largely neglected. In China, the neglect might be due to pressures for meeting the production targets or due to the extreme policies of 'eating from the same pot' and lack of rewards for performance. In India, the neglect was mainly due to financial dependence on the state, which had declining priority for agriculture.
- v. The major achievements in yield in both countries are based on the centrality of Green Revolution approach with increasing importance of seed-fertilizer-irrigation technology rather than promoting sustainable agriculture in dry land and/or low productivity regions.
- vi. Consequently, both countries are facing environmental degradation, saturation in the yield growth using the Green Revolution approach, and need for inducing private investment in agriculture. While in China this necessitates reforms in land rights and cooperativisation of private holdings, basic investment by the state on the community resources with collective management becomes a necessary requirement in the Indian case.
- vii. Finally, both systems need an appropriate form of cooperative and/or collective efforts for better management of their natural resources. But, at the present juncture China has to move from complete to partial collectivization, whereas India needs to move from a more or less complete dependence on the state to a decentralized collectivization with declining dependence on political authorities at the state/central levels.

Prima facie, this suggests that the task ahead for India is much more difficult than that in China for the sheer fact that moving from restrictions to freedom is a relatively smoother transition than going the other way round. Moreover, India is yet to provide effective support in terms of health, education and nutrition to a large proportion of the rural population, which also needs efforts for building up local institutions. Finally, the yield levels achieved even in irrigated areas are fairly low as compared to China. The need therefore is not only to increase the yield level, but also to make the available stock of food grains reach the poor. With these special challenges faced by India what is inescapable for both the countries is to focus increasingly on land and water resources. What follows is a brief account of the environmental degradation that is currently being faced by China and India.

IV. PRESENT SCENARIO: SOME ISSUES

4.1 China

Following the ten years of turmoil and a significant change in political leadership in the post-Mao period, agrarian structure in China took a U-turn towards restoration of democratic rights of the peasants under what came to be known as 'household responsibility system'. The new policies adopted in 1979, and consolidated by 1984, laid special emphasis on providing special incentives to the peasants and the communes to resume investment on farmland capital construction, which apparently had suffered a lot during the previous phase.

Not surprisingly therefore, agricultural production did show a significant increase with a much more diversified production basket as noted by a large number of studies taken up during the post-reforms period⁸. For instance, it has been argued that "decollectivisation of recent years have been accompanied by an unprecedented acceleration of growth rate of grain harvest which grew by 5 per cent per annum between 1977 and 1983. Much of this increased production and

⁸. Ironically, the production estimates for the period immediately after the reforms are also likely to be subject to an upward bias for the reason as that in the case of the initial phase of 1949-52 i.e. to boost-up the people's morale in favour of the new policies.

productivity was accompanied by simultaneously shifting the heavy load of underemployed labour from farms to other sideline activities. Removing this burden by engaging them in trade and industry was essential not only for enriching the rural economy but also for reducing the cost of food production as well as for increasing labour productivity (Jean, 1999).

However, with this, and also with the growing consumption levels among rural households, investment on farmland capital construction started dwindling, contrary to the expectations. Moreover, with shifting of priorities, even community based investment started slowing down. Hence, soon after the record harvest of 407 million tonnes in 1984, the growth in agricultural production had shown a set back in 1985. It is important to note that only a part of this decline was attributable to the unfavourable climatic conditions. In fact, there was a realization that much of the productivity gains, achieved due to reorganization of production relations, were exhausted. And, that the future growth will face the new challenges of increased investment in (a) irrigation, (b) farmland capital construction and (c) environmental regeneration. The policy makers saw in this, need for a fresh round of reforms with further liberalization of land rights, which by then, were considered essential for enhancing investment in farmland capital construction.

The next stage i.e. the post-1984 period was therefore marked by a serious debate on restructuring of the contract system involving long-term contract, land readjustment and circulation (Gao and Chi, 1977). It was being increasingly realized that the existing contract responsibility system was still not conducive enough for inducing farmers' investment on land. This was so because (a) despite the increased freedom over disposition of land and surplus income, farmers still had to pay the arbitrary charges imposed on them by the higher authorities; (b) the responsibility system gave right to each member of the collective to use land, which implied that with every newborn member, the land-rights had to be readjusted even within the contracted period of 15 years; and (c) declining landholdings, much below the critical minimum size of two hectares.

The issue of land adjustment was crucial at this stage. There were mainly two types of land adjustments: first refers to small scale adjustment which takes place due to changes in population within households; and the second refers to large scale adjustment which takes place at village level every three to six years. In the event of the second type of readjustment, households have to first return the land to the collective for redistribution. This implied that households may get different pieces of land when such redistribution took place. This kind of readjustment obviously, is quite unfavourable for promoting long-term investment on land (Gao and Chi, 1977).

Similarly, absence of a mechanism for land circulation also resulted in unnecessary tying down of rural labour to land. This was becoming increasingly problematic with the expanding opportunities for undertaking various sideline activities. Finally, the contract responsibility system seemed to have resulted in faster fragmentation of land, and thereby reducing the scale of operation further. Together, these factors seem to have resulted in sub-optimal use and waste of cultivable land, which had already started shrinking because of the growing demand from the industry-urbanization combine. Thus, on the one hand, those who were willing, did not have enough land, while others, who did not want to cultivate their small plots, let the land lie waste.

In order to cut down expenses, farm households at times, had refused to accept social services and some had even sold their tractors and other farm machines in order to till their plots more cheaply. Consequently, in some of the low-productivity areas, farmers' income grew very slowly, and at the same time, they were not able to shift to the areas of high productivity lest, they may lose their land-rights. Ironically, many of the farmers did not like to give up their land rights, despite the low farm productivity as well as income, partly because they expected better price for land-rights in anticipation of the growing modernization in the economy.

The new developments in the post-reforms period thus, had necessitated another round of reforms with respect to the property rights regime in China. As a result quite few changes had already started taking place by the end of the last decade. For instance, collective property was being converted into shares and distributed to

individuals. Similarly, land had also started being cultivated collectively. The same was true for forest regions (Gao and Chi, 1977). Apart from this, re-renting and land circulation as well as accepting land as a form of capital had also started taking place in the later part of the nineties. It is expected that these kinds of changes in the agrarian system may facilitate the on-going process of rural reforms and pave way for a stable enterprise system characterized by a variety of economic elements.

4.2 India

The contemporary situation in India is marked by continued search for appropriate ownership-structure, combination of partners/stakeholders and institutions within the overarching framework of "participatory development". A recent review of the experiences of WDPs in India suggested, "successful projects are, so far, few in number and have operated under special conditions which can not be easily replicated. If success is to be sustained, and is to spread quickly to the new areas, new partnerships will be needed between central and state governments, district administration, panchayati raj institutions, non-government organisations, line agencies and communities themselves (Turton, *et al* 1998).

Thus despite the euphoria of participatory processes, questions still remain about the quality of participation and equity in terms of benefit sharing. The diverse experiences from field thus, have led to a realization that local communities have to play a 'major but not exclusive' role in a participatory approach. This, in turn, suggests recognizing the critical role of the state and its bureaucracy to work with participatory approaches without fundamental changes (Thompson, 1995). This is essential, not only for scaling up, but also for ensuring certain outcomes that have direct bearing on national level objectives like increase in food grain production.

Apparently, the policy making process in India does not recognize the need for state intervention as a means for achieving national targets. This is so, probably because WDPs are yet to be systematically linked up with the objective of food security at the level of macro planning. If this is ensured, the inevitability of state's pro-active intervention and effective governance in the specific context of WDPs will also be

clearly recognized. At present what is missing in the present discourse on participatory approach is appreciation for a "stick" which the state ought to use in order to put certain basic pre-conditions at place. These are modifications in the existing property rights, 'regulated' rather than 'free' use of common property resources, and input-use efficiency. Ideally, these are some of the basis aspects on which the state ought to take a lead so as to help shaping up participatory institutions on a sustainable basis. The Chinese experiences provide useful lessons in this context.

V. FUTURE DIRECTION

The crucial issue facing China's agrarian economy is the need to mobilize resources, essential for exploring new avenues for a yield-based growth, which seems to have reached a plateau. In the wake of rapid economic reforms, the need is to search for a new set of institutional mechanisms that can (a) provide adequate incentives for promoting long-term investment on farmlands; and (b) at the same time, ensures proper maintenance and future management. While the recent moves towards cooperative efforts is a welcome step, one is not sure whether sheer dependence on individual initiatives can meet the investment needs, many of which may not bear immediate fruits in a visible future. Three central questions thus, emerge time and again:

First, is the process of rapid decollectivisation really necessary to ensure growth in farm investment as well as production? Second, how to generate adequate incentives for mobilizing private investments in FLCs (and also in agricultural R&D) that have long gestation period? And third, how to mobilize additional resources for taking care of the hitherto neglected resources and regions? Apart from revamping the tax structure, is there a scope for revitalizing the collectives especially, in the low productivity dry land regions, so as to combine the local labour force with the financial support that has to come largely from the state?

Against this, the issues facing the Indian policies pertain to collectivization of ownership and control of natural resources, especially those under common

property regime. Community pastures, degraded wasteland and water (other than ground water) are the major concerns in this context. The major problem with CPRs at present is that they are subject to 'open' rather than 'regulated' access. Participatory processes and institutions can bring them under regulated access but, these institutions, even if properly developed, take a long time before they acquire a status of the binding principles/rules. What is therefore needed during the transitory phase is stronger governance, which can ensure efficient use of land and water resources. This, inevitably, would involve a tripartite system with a growing partnership between the community, the developmental agencies and the state. The recent initiatives for watershed development projects do provide a scope for a system like this. But the problem with these participatory institutions is that they operate in a scattered and often-isolated manner, without being directly linked with the macro level objectives of enhancement of production through input-use efficiency.

Apparently, most of these issues also have important political undertone hence, they can be resolved only in the larger context of policy-making processes in the two countries. Following suggestions, emerging from the experiences of China and India may bear special relevance for promoting investment in FLC/SWC in a manner that can ensure productivity growth along with environmental sustainability. These are:

- i. Self-financing characteristics of FLC in China are the most crucial aspect for ensuring economic as well as institutional sustainability. This should be retained to the maximum possible extent. Among others, a possible means to achieve this is by linking up the wage income from FLCs with additional investment in the sideline activities like animal husbandry, processing of cattle feed, and animal products, and promotion of high value products like horticulture etc. by using modern methods of production.
- ii. Economic incentives alone may not be sufficient to take care of the long-term needs in terms of FLC-work. Some kind of political persuasion and monitoring might be necessary to go along with the legal and economic reforms. This is relevant not only for China but also for India. For, participatory institutions cannot entirely be taken as a substitute for effective governance by the state.

- iii. There is a close complementarity between public and private investments, which need to be explored adequately. If properly supported by extension and credit services, private investments do come up with a variety of institutional and/or market developments that can take care of the scale problem. At present, the WDPs in India tend to depend heavily on public investments, without any further efforts to calibrate a private investment that follows. In this context, Chinese experiences with regard to regulated decollectivisation in the recent times, might help in blending the two.
- iv. The important lesson for India is that it should learn to forge ahead, in a time bound manner, by facilitating community ownership of resources (including ground water), and closely monitoring the outcome of such initiatives. The Chinese experiences demonstrate special relevance of the state in achieving a new balance between incentives and targets, and consolidating them within a given time frame.
- v. Finally, the most striking feature of the Chinese experience is that despite being a strong state, it is able to try out different institutional options for land and water management. Should India explore new options for ownership and control of land and water resources through alternative property regimes? This issue calls for an active public on a priority basis.

Table 1: Agriculture in China and India: Some Important Features (1993)

Indicators	China	India
Net Sown Area - NSA (million hectares)	97	142
Gross Sown Area - GSA (million hectares)	149	186
Gross Irrigated Area as % to GSA	49	36
Yield of Food Grains (Kgs./Ha)	4100	-
Cropping Intensity	1.55	1.31
Use of Chemical Fertilisers – 1996 (NPK-Kgs/ Ha of NSA)	367	99
Daily Per Capita Supply of Calories (1996)	2844	2415

Source: Central Statistical Organisation (1995), Statistical Abstract of India, Government of India, New Delhi; and China Statistical Year Book (1996), China Statistical Publishing House, Beijing.

Table 2: Initial Conditions in China and India: 1950-51

Indicators	China	India
A. Initial Conditions		
1. Net sown area (Million Ha.)	110	119
2. Area under food grains (" ")	108	97
3. Gross cropped area (GCA) (" ")	114	132
4. Grain production (Million Tons)	125	51
5. Population (Million)	575	361
6. Per capita grain production (Kgs.)	217 (288)*	141
7. Grain yield (Kgs./Ha)	1093	522
8. Gross irrigated area as % to GCA	18.4	17.1
9. Use of chemical fertilizer (Million tons)	0.08	0.07
10. Per capita net sown area (Ha)	0.19	0.33
11. Per capita net sown area for population in agriculture (Ha)	0.25	0.43
B. Growth (I Plan) %		
12. Agricultural production	4.5	3.6
13. Net sown area	3.7 (14.2)**	7.7
14. Yield	23.3	15.9
15. Irrigation	30.0	24.3

Note: * As per the official estimates
 ** Taking 98 million hectares of net sown area as a base in 1949

Sources: Estimates for China are based on National Bureau of Statistics, *Statistical Year Book* (Beijing: China Statistical Publishing House, 1966), and estimates for India are based on H.L. Chandok and the Policy Group, *India Database: The Economy*, Vols. 1 and 2 (New Delhi; UM Books, 1990).

Table 3: Profile of Policy Initiatives Under Different Phases: China and India

Country	I. Pre-Independence Phase (Before 1949)		
	Problems	Measures	Status/Outcome
China	Severe neglect of traditional FLCs especially water conservancy; increasing pressure on land; highly suppressive land relations	Traditional labour sharing; intensive manuring; improved seeds	Limited flood control, lack of investment in FLC and opening of new land; already higher levels of yields.
India	Moderate degradation because of the relative low pressure of population; less suppressive land relations, and low input agriculture with livestock as an important part of the coping up strategy in dry land regions	Special dry land farming programme started during the colonial period; Traditional irrigation system with community management; State's support for water conservancy under the princely states in dry land regions like Rajasthan and Gujarat	Frequent droughts; low and uncertain yield in general and dry land region in particular
II. First Five Year Plan: Upto 1956/7			
China	Complete land reforms; Co-operativisation and Collectivization; Labour pool for FLCs; Emphasis on opening new land for cultivation and repair of irrigation channels and flood control	Consolidation of holdings; Capital-labour substitution in FLCs; Increased area under crop; Expansion of irrigation; Improved management of the traditional water conservancy system and reduced siltation leading to flood control; but unscientific use of pasture and forest land.	
India	Partial land reforms and consolidation of holdings; Area expansion through price-incentives, input subsidy, extension support, development of market and various area development programmes under 'Grow More Food' campaign	Limited success in land reforms with insignificant achievements in consolidation of holdings; Expansion of cropped area by converting culturable wasteland; Fairly good response to the public support system and price incentives	

Table 3 (Continued)

Country	III. Towards Green Revolution (1958-1966)	
	Measures	State/Outcome
China	Large scale communes and reversal to smaller communes; Limited incentives for sideline activities; Major investment in irrigation and flood control in the high productivity regions	Revival from the deep fall in crop productivity and output; Diversification and new crops; Intensive irrigation; Communes based management of FLCs with some incentives for private investment on crop-land
India	Large scale investment in major irrigation systems; river valley projects for checking soil-erosion; Command area development projects	Soil water conservation on large scale irrigation project; private initiatives for checking soil erosion especially on irrigated sloppily land
	IV. Green Revolution/Cultural Revolution (1966-76)	
China	Delinking productivity and rewards; Merging of administrative and commune management; Pressure to perform especially with respect to FLC and RCC; Shifting of labour teams to more productive regions; Heavy dependence on chemical fertilizer within high productivity region; Emphasis on grain-production alone	Stagnation in cropped land; Disincentive for private investment on crop land; large scale FLC/RCC in order to meet the targets without much concerns for quality and maintenance; large scale deforestation; moderate achievements in yield-growth with already high level of base year yield
India	Promoting yield through subsidies and extension services; Concentration of a few high yielding crops like rice and wheat in select areas; relative neglect of dry land crops/regions; Emphasis on higher yield rather than input-use efficiency; Private investment to check erosion on irrigated land	Significant increase in yield with low base level yield; Growing inter-regional inequality; Increased stability in yield at macro level; Stagnation in net sown area; Increased private investment in response to public investment

Table 3 (Continued)

Country	V. Post Reforms/Post Green Revolution (1978 And After)	
	Measures	Status/Outcome
China	<p>Increased fragmentation land; Efforts to stabilize landholdings; Reduced private investment on crop-land due to changing land rights in the initial phase of the post-reforms period; weak link between FLC and productivity in order to get quick results; Increasing diversification; Initiating large scale projects for afforestation and watershed development mainly at the instance of the external agencies</p>	<p>Rapid reforms in land-rights; Diversification of crops from grains to commercial crops; Shortage of labour to under FLCs; Increase in yield mainly due to increased use of chemical fertilizer; Reduction in net sown area due to sectoral diversification and urbanization; Under reporting of the actual net sown area; Saturation in yield growth; Increasing concern of land degradation and environmental sustainability; Realized need for reviving the co-operative system</p>
India	<p>Realized need for widening the coverage of Green Revolution across crops and regions; Increased recognition of the need for supporting dry land farming; Formulation of special programmes for wasteland development through plantation; Promotion of dry land farming through Integrated Watershed Programmes; Special subsidies for small and marginal farmers to adopt the modern inputs; Large scale SWC-work under special employment programmes and relief work programmes</p>	<p>Spread of HYVs/Improved seed for some of the dry land crops viz; bajri, maize, groundnut, mustard, cotton etc. Rapid development of social forestry with monoculture of commercial plantation; Encouraging results from pilot watershed projects in dry land regions and also from wasteland development at select places; Shrinkage of public investment in agriculture in the past eighties; Absence of link between special employment programme and increase in farm productivity</p>

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