INDIGENOUS RURAL CAPITAL FORMATION AND ECONOMIC DEVELOPMENT

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It goes without saying that economists have made much of the need for, and mechanism of, capital formation in the process of economic development, but hardly any have looked at capital formation--and in particular, rural capital formation--as it actually occurs in developing countries. For example, all that Lewis can find to say is:

> "... those peasants who save tend to invest either in lending to less fortunate peasants, or else in buying land, and in neither case is the result an increase in capital formation. Buying land raises the price and alters the distribution of land, but it does not make land more productive. If the peasants own the land they may invest in improving it, but most of the techniques of improving land involve a temporary reduction in its yield (fallows, rotations, afforestation, grass strips, erosion control), and are not popular in areas where the pressure on the land is considerable. Peasants also like to invest in cattle, but the attitude of many peasants in Asia and in Africa to cattle is not commercial, so that in many cases this investment is a burden rather than a source of profit."[1]

Other writers have explicitly or implicitly agreed with Lewis's view, in so far as they have had a view, but my contention is that it is inaccurate and misleading. Moreover, I shall attempt to show that rural productive investment is more extensive than is generally realized, and that the potential importance for economic development of rural investment is not insignificant. Furthermore, the nature of some types of rural investment has major implications for certain branchs of development economics: In particular for social cost-benefit analysis. These are the kinds of investment that involve direct unpaid family labour rather than the purchase of capital by the accumulation of savings. In reference to this I use the terms 'labour-investment' and 'labour-capital,' where these refer to 'investment or capital formed with the direct use of unpaid family labour,' that term being somewhat cumbersome for frequent use.

Before going on to look at the empirical data, it is worth noting a conceptual point here. That is, that there cannot be a simple distinction between types of investment that involve savings and types of investment that do not; there are generally only differences in degree, although sometimes these may be very great. In other words any particular type of investment (e.g., construction of terraces) may <u>either</u> be 'savings-investment' (if the labour is hired) or 'labour-investment,' but some types are unlikely to be labour-investment (e.g., investment in a tractor). Moreover, even with labour-investment, some consumption may be foregone, for example,

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[1]W. A. Lewis, <u>The Theory of Economic Growth</u>, George Allen and Unwin, London, 1955, p. 227.

if the labour used to construct bunds is diverted from currently productive activity. For instance, it is clear from a Kenyan case[2] that terracing and the like conflicts with current productive activity because it is considered too difficult work in the slack dry season owing to the hardness of the ground.

A more general concept of labour-investment is the idea that utility is foregone, which includes both 'leisure,' and consumption, the extent to which there is saving, depending on circumstances. However, it is clear that insofar as labour-investment exists and that this is not carried out entirely by diverting labour from current production, then total investment may be greater than total savings (if we are allowing savings to include foregone production as well as simply foregone consumption).

The Extent and Nature of Rural Capital

Much of the available information, especially quantitative, is for India, two of the major sources being the All-India Rural Credit Survey of the mid-fifties and the National Sample Surveys. From the latter, Hoselitz[3] calculates the ratio:

Gross Investment/Gross Income = 12 percent (1950/51)

From the All-India Rural Credit Survey he obtains:

Net Investment Including Housing/Net Output = 8.5 percent (1951/52)

Net Investment Excluding Housing/Net Output = 7 percent (1951/52)

Of course the accuracy of the data leaves very much to be desired, especially with regard to the inventory of capital items and more so, their valuation.

The ratios vary quite a lot from region to region, from village to village and no doubt from year to year. One village had an investment ratio of 16.5 percent and one District of Bombay State in the mid-fifties was apparently investing 23 percent of its income.[4]

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[2]J. U. Heyer, Agricultural Development and Peasant Farming in Kenya, unpublished Ph.D. thesis, University of London, 1966.

[3]B. F. Hoselitz, "Capital formation, saving, and credit in Indian agricultural society," in Capital, Saving and Credit in Peasant Societies, ed. by R. Firth and B. S. Yamey, George Allen and Unwin, London, 1964.

[4]ibid.

Purcal, in a study of Malaysian rice farmers[5] valued the labour-investment in bunding and other types of water control, by applying a slack season wage and a busy season wage to the labour time put in. Investment ratios were about 10-15 percent, although it is not clear how much was depreciation.

Turning from aggregate investment ratios to the composition of the capital-mix, we immediately run up against the problem of deciding what is capital and what is not. This is really a question of deciding on the productiveness of items, given that they are assets, i.e., that they supply utility or output or both for more than one year, and that land is excluded. The two major items in this regard are buildings and livestock. Farm buildings that are not human dwellings are fairly acceptable as capital since they presumably raise output indirectly and last for more than a year, but there is no accepted convention as regards dwellings; sometimes they are considered part of the capital stock, their output being rent, actual or imputed; sometimes they are considered durable consumer goods. There is also the problem that human dwellings may serve for livestock shelter or other 'farm' purposes such as storage; or extensions of the dwellings may function in this way, so that there is no clear distinction between consumption and production.[6] Draft cattle are presumably respectable capital, but other livestock may or may not be, depending on one's view.[7]

Bearing all these difficulties in mind, we may scrutinise Table 1 for the composition of the Indian rural capital stock, where it can be seen that livestock are the dominant type of investment. It is difficult to find out how much investment is labour-investment, but Tara Shukla[8] suggests that about 60 percent of bullocks are purchased, 40 percent home-reared (i.e., labour-investment), and probably much construction work is labour-investment.

For Africa, there is virtually no reliable data, but it is worth simply listing types of capital formation, some of which may be unsuspected. Also it is worth mentioning that there is likely to be more labour-investment than in the more monetised Asian countries.

Economic trees, such as cocoa, coffee, oil palms, etc., are an obvious case of rural investment, and mostly labour-investment; terracing, fencing, drainage, bunds, ploughs and draft animals, are the other major forms and are principally in evidence in the more densely populated and intensively cultivated regions, such as the Ethiopian highlands, the Lake Victoria

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[5]J. T. Purcal, Rice Economy: Employment and Income in Malaysia, Honolulu, University Press of Hawaii, 1972.

[6]But this sort of confusion applies to labour as well as capital. Are fishing and hunting labour or leisure? They are certainly intended to be productive!

[7]Interestingly (and confusingly) enough, the words 'cattle' and 'capital' are derived from the same root.

[8]Tara Shukla, Capital Formation in Indian Agriculture, Bombay, 1965.

region, including the Kenyan highlands and Rwanda and Burundi, Northern Nigeria and Cameroun, and Southern Nigeria and the coastland through Benin, Togo and Ghana. But it is wrong to suppose that these are the only places where there is much investment; it is surprisingly widespread, albeit hard to find in sparsely populated areas, like Zaire, much of the Sahel, or the central-southern bulk of Tanzania. Lack of space prevents any detailed description of African examples of capital formation, however.

Table 1

Capital formation on Indian farms (percent)

	1951-52	1961-62
Livestock	45.4	55.3
Implements, etc.	10.5	14.2
Bunding and other land improvements	7.7	11.1
Digging wells and other irrigation	13.3	10.0
Reclamation of land	4.3	3.6
Construction of farm buildings[1]	4.8	3.6
Orchards and plantations	4.8	1.4
Other	9.2	.9
	c.100.0	c.100.0

[1]Excludes residences.

Sources: All India Credit Survey and All India Rural Debt and Investment Survey, Reserve Bank of India Bulletin, June 1965.

Factors affecting the level and character of rural investment

Two broad forces are singled out here as being of major influence: One is population pressure and the other is the land tenure system where this is intended as a broad term to cover allocation and taxation of land and security of tenure.

(i) Population pressure

Boserup[9] in effect suggests that as populations grow, new techniques tend to be established which involve harder work and the substitution of

[9]E. Boserup, The Conditions of Agricultural Growth, George Allen and Unwin, London, 1965.

capital for land (as well as social and economic reorganisation of various kinds). This view is supported by the Indian data shown in Table 2, where a fairly clear relationship between population and capital stock is apparent.

Simon's recent inter-country study of investment in irrigation[10] also tends to support the population pressure hypothesis. For instance, he has the following regression equation fitted to data from 18 Asian countries:

$$I/C = \text{constant} + 6.06\ P/C \quad (R^2 = .42), \quad (t=3.43)$$

where I = irrigated area,
C = cultivated area and
P = population.

Cross-sectional, District, data from Sierra Leone show a quite strong correlation between the rate of investment in the clearance, bunding, etc., of swamps for the permanent cultivation of rice, and the shortness of the fallow under shifting cultivation (as an indicator of population pressure).[11]

The reader may well wonder what the policy implications of this process are--after all, it is not being suggested that people are doing any more than running in order to stay in the same place (or perhaps not even to keep up their standards of living). The point is that insofar as capital formation is already ongoing in response to population growth, then diverting resources from agriculture, or even within agriculture, will probably have a cost not only in foregone output, but in foregone investment and thus future output. Conversely, encouragement of the ongoing process of investment is likely to be a less costly strategy than one that neglects the process.[12]

(ii) Land tenure

Tables 3, 4, and 5 give data from three Indian village studies, suggesting that investment per acre falls with increasing farm size. That there tends to be this kind of inverse relationship to farm size for labour input per acre and output per acre is now generally accepted (although with some reservations about the meaning of the relationship), but as far as is

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[10]J. L. Simon, "The positive effect of population growth on agricultural saving in irrigation systems," Review of Economics and Statistics, Feb. 1975, pp. 71-79.

[11]John Levi, "Population pressure and agricultural change in the land-intensive economy," Journal of Development Studies, Oct. 1976.

[12]For discussing of the cost of ignoring the existing investment process see John Levi "African agriculture misunderstood: Policy in Sierra Leone," Food Research Institute Studies, Dec. 1974.

Table 2

Indices of durable physical assets, India

	All assets	Excluding houses	Excluding houses and land	Excluding houses, land and irrigation	Population
1920/21	92.9	94.4	82.1	80.2	74.75
1925/26	93.5	94.6	83.3	84.4	77.91
1930/31	95.9	96.2	86.7	87.7	81.40
1935/36	96.4	96.3	88.5	88.6	86.37
1940/41	98.2	98.0	92.0	85.6	91.93
1945/46	99.2	99.2	93.9	87.6	95.80
1950/51	100.0	100.0	100.0	100.0	100.00
1955/56	103.4	104.1	108.7	108.2	109.91
1960/61	N.A.	110.4	127.0	120.1	120.82

Source: Tara Shukla, Capital Formation in Indian Agriculture, Bombay, 1965, p. 111.

known, such a relationship for investment has not been noted.[13] At first the evidence seems to conflict with that of Griffin,[14] which appears to show a positive relationship between capital per acre and size of farm on a large sample of Sri Lanka rice farms. However, the 'capital' referred to is decidedly not of the labour-investment variety, i.e., it only includes tractors and weedicides; there is no mention of land improvements, buildings, livestock and the like.

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[13]Mazumdar noticed that Indian Farm Management Survey data from the fifties depicted declining capital stock per acre with increasing farm size, but did not know what to make of it. D. Mazumdar, 'Size of farm and productivity: A problem of Indian peasant agriculture,' Economica, N.S. Vol. XXXII, 1965.

[14]K. Griffin, The Green Revolution, U.N.R.I.S.D., 1972.

Table 6 refers to the same survey as Table 5, and it shows how the character of 'investment' (including land) varies with farm size (although we are certainly in need of more data than this for firm evidence). Clearly there is a transfer of land, as suggested by Lewis (in the above quotation), from the smaller to the larger size groups, and thus growing inequality.

Table 3

Fixed investment per acre in three zones of Haryana State
Rs. by farm size, 1971/72

	Total i't	Ave. acres	I't per acre
Zone I			
Small	975.7	8.32	117.3
Medium	1,331.3	14.54	91.6
Large	2,843.7	27.92	101.9
Zone II			
Small	896.9	13.57	66.1
Medium	1,318.6	20.15	65.4
Large	1,857.2	33.67	55.2
Zone III			
Small	601.7	5.04	119.4
Medium	754.1	19.76	38.2
Large	1,833.4	30.27	60.6

Zones: I = assured irrig.; II = relatively less assured irrig.; III = unirrigated.

Investment: = Purchase of farm machinery, livestock, poultry and equipment, purchase and construction of farm buildings (seems to be implied--though not clearly stated--that buildings are non-residential), reclamation of land, plantation, and other fixed investment.

Sample: 24, 31 and 29 farmers in Zones I, II and III respectively.

Source: K. N. Raj, et al, IJAE, 1972.

Table 4

Investment per acre by farm size, in four Indian villages
c. 1970 (?)

	Size group (acres)	Ave. operational area (acres	I't excl'g land R's	I't per acre R's
"Traditional" farms	-5	3.82	168	44.0
	5 - 10	7.13	202	28.3
	10 - 15	12.31	128	10.4
	15 - 20	12.67 (?)	165	13.0
	?0 +	21.74	167	7.7
"Modern" farms	-5	3.44	448	130.2
	5 - 10	7.31	408	55.8
	10 - 15	12.44	286	23.0
	15 - 20	18.11	335	18.5
	20 +	29.17	558	19.1

Investment includes: House and buildings, livestock, tools, machinery, land improvement.

Source: Ghosh, IJAE, 1969.

Table 5

Investment by farm size, Bihar, 1963-64
(36 holdings in each size group)

Acres	Net i't excluding land (R's)	Ave. acres	Net i't per acre (R's)	Net i't excluding farmhouse (R's per acre)
Less than 2	87	1.42	61.26	11.97
2 - 5	91	3.44	26.45	15.70
Over 5	179	10.59	16.90	12.75

Table 6

Net "Investment" by type and farm size, Bihar, 1963-64
Ave. per holding, R's

	Acres			All sizes	Percent
	-2	2 - 5	5+		
Purchase of land	-10	24	214	76	39.2
Purchase of livestock	- 9	42	84	39	20.0
Implements, etc.	5	8	10	9	4.1
Construction and improvement of farmhouse*	77	37	44	52	26.5
Bunding, land improvements and land reclamation	14	1	27	14	7,2
Development of irrigation	-	3	6	3	1.5
Laying orchards and plantations	-	-	8	3	1.5
				195	100.0

Source: Shastri, Indian JAE, 1965.

*Not clear how much is residential, but it seems unlikely that the small farmer would invest more in his house than the large farmer.

I have not found much hard evidence for the influence of security of tenure on investment, although it is said with regard to India at least that investment among sharecroppers appears from the evidence to be biased towards construction of farm houses and livestock rearing, whereas part-owners and owners are more diversified.[15] Also "... khatedar farmers who have most secured rights in land have invested largely in irrigation (33%) improved farm machinery and equipment (29%) and land improvement (10%). Non-khatedar farmers who cultivate land as sharecroppers have invested mostly on milch cattle (49%) draft animals (17%) and farm buildings (22%)."[16]

A very clear statement of the effect of tenure security is in a study of Jamaican farmers[17] among whom those with insecure tenure said that it was not worth while investing labour in soil conservation (lateral ditches, terraces, etc.) unless they were sure of the return for several years, and that such investment would actually increase the likelihood of the land being repossessed, whereas farmers with secure tenure were investing in soil conservation.

All of the above evidence reinforces the arguments in favor of land reform, land tax, or both, as means of raising investment, both because a smaller average size of farm would mean a higher average investment per acre, and thus higher investment, and because they would inhibit the chanelling of investible funds into the barren and destructive transfer of land towards the large farms.

Lack of space prohibits any discussion of rates of return, but Lal's estimates for wells in Maharashtra[18] and the writer's for investment in swamp development in Sierra Leone suggest that they are rather sensitive to plausible variation in the important parameters (shadow wage, yields, etc.), but that they can be reasonably high (which is also suggested by Gotsch's

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[15]Indian A.E.S. Conference, Report of Rapporteur (Mrs. Tara Shukla), IJAE, 1969.

[16]Ibid.

[17]D. T. Edwards, Report on an Economic Study of Small Farming in Jamaica, Institute of Social and Economic Research, University College of the West Indies, Kingston, Jamaica, 1961.

[18]Deepak Lal, Wells and Welfare: An Exploratory Cost-Benefit Study of the Economics of Small-scale Irrigation in Maharashtra, Development Centre Studies. Series on cost-benefit analysis. Case Study No. 1, Paris, O.E.C.D., 1972.

estimates for Persian wheels in the Punjab).[19] Perhaps the lesson to be learned from this is that it does not bode too well for public rural investment, which is not noted for its sensitivity to micro-economic parameters.

Another major implication of the importance of labour-investment is that it seems to remove savings from the central place it occupies in thinking on economic growth and cost-benefit analysis. In particular, the Little-Mirlees Method[20] tends to employ the assumption that one Rupee of savings is more socially valuable than one Rupee of consumption because savings is thought to generate growth; although Lal[21] allows that for the very poor, present consumption may be worth as much as savings, or future consumption. Labour-investment, though, does not involve foregone consumption - at least not much - but rather, foregone non-labour time, which in the poor rural areas of the world is not all that scarce! Thus my view is that labour-investment is relatively low in social cost, whereas savings-investment is socially costly;[22] the standard assumption should perhaps be reversed, with one Rupee of savings worth less, not more, than one Rupee of consumption.

It is possible too, that indigenous investment has an interactive or synergistic effect when combined with other forms of innovation (the whole return being greater than sum of the individual returns). That this was so in Japan is suggested by Sawada's evidence[23] that most of the small scale irrigation works were created before the Meiji restoration and formed the basis of the later development through new rice varieties and fertilizer.

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[19]C. H. Gotsch, et al., 'Linear programming and agricultural policy: Micro studies of the Pakistan Punjab,' Food Research Institute Studies, Vol. XIV, No. 1, 1975, p. 19.

[20]I. M. D. Little and J. Mirlees, Manual of Industrial Project Analysis in Developing Countries, Vol. 2, Social Cost Benefit Analysis, Paris, OECD, 1968.

[21]op. cit.

[22]Indeed it looks rather tautological to say that the sacrifice of consumption by the poor is socially costly.

[23]S. Sawada, 'Technological stages in agricultural development, their determinants and perspectives,' in The Future of Agriculture, papers and reports of the 15th International Conference of Agricultural Economists, Oxford, 1974.