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Effect of Land Diversion from Agriculture to Industry in a Dualistic Economy

Hiranya Lahiri*

Jadavpur University, Kolkata-700032, India

* E-mail of the corresponding author: hiranyaeco@gmail.com

Abstract

This paper seeks to analyze what will be the effect of diverting agricultural land for industry in a dualistic economy framework. In many LDCs, like that of India, the government's strategy for development has been forceful acquisition of agricultural land for industries which produce goods that do not lead to trickle-down effect to the unorganized sector. As a result, the largest part of GDP accrues to the tiniest section of the population, thus, leading to huge unemployment in the country. Definitely this is not the correct development strategy for an LDC.

Keywords: organised sector, unorganised sector, industrialization.

1. Introduction

The policy makers of LDCs often consider the development of the industrial sector as a necessary condition for the growth of the economy, and this often comes at the cost of the traditional of the agricultural sector. Infact, faster face of expansion of the industrial sector is considered as a pre-requisite for the growth of a LDC (Agarwala, 2006). As a result, government diverts land from agriculture to industry which produces luxury goods that are unaffordable to the poorer section of the population engaged in the agricultural sector. The purpose of this paper is to show that a developmental strategy in these lines is clearly suicidal for an economy.

Ghosh and Das (2006) consider a framework that goes on to show that subsidization of the industrial sector that produce goods which lack forward linkages do not lead to the trickle-down effect in an under-developed economy. Bhaduri (2007) further criticise the fallacy of creation SEZ as this is definitely not a pro-poor kind of developmental strategy. The correct growth regime for an under-developed economy is to create forward linkages that will help expand the organised as well as the traditional sector. Moreover, a growth process that leads to the accumulation of wealth in the hands of only a few leads to inequality and hence is not pro-poor.

This paper chalks out a theoretical framework in which diversion of agricultural land towards industry leads to a contraction in the agricultural sector as well massive employment in it. Further this process is clearly inflationary. Section 2 presents a two-sector model showing the inter-linkages between agriculture and industry. Section 3 does the comparative-static result of shifting agricultural land to industry and accesses its impact on output levels of the two-sectors and employment. Section 4 cites some of the recent experiences in India and provides statistical evidence to the result inferred in section 3. Section 5 concludes the paper.

2. Model

We shall now lay down a formal two-sector model. We consider that the two sectors are agriculture sector and the industry sector. The agriculture sector produces one type of output denoted by X while the output of the industrial sector is denoted by Y. The production structures of the two sectors are as follows. There are landlords who recruit labour and produce X, paying a nominal wage of W per worker. The production

function of X, as given in equation (1) is a positive function of labour recruited and land available for agriculture.

$$X = X(L_X, l_X) \tag{1}$$

The profit function of the landlord (who themselves own the land) is:

$$\pi_X = PX(\cdot) - WL_X \tag{2}$$

Hence the foc is:

$$\frac{\partial X(\cdot)}{\partial L_X} = \frac{W}{P} \tag{3}$$

Coming to the industrial sector, wages are rigid due to the existence of trade unions and the industrialists follow a Kaleckian-type of pricing, with a fixed mark-up of α over the average-variable cost of production. Production of Y is a positive function of labour and capital employed, the latter being fixed in the short-run. The profit function is therefore written as:

$$\pi_Y = P_Y Y(L_Y, \bar{K}_Y) - \bar{W}L_Y - r\bar{K}_Y \tag{4}$$

Where $$P_Y = (1+\alpha)a \tag{5}$$

And $$a = \frac{\bar{W}L_Y}{Y(\cdot)} \tag{6}$$

Regarding the inter-relationship between the two sectors, we assume that X is consumed only by the workers employed in the industry, and that, these workers spend their entire income on buying X. Now, given that α is the constant mark-up over the average-cost in industrial sector, the share of wages in Y is given as:

$$\frac{1}{1+\alpha} \tag{7}$$

Thus equilibrium condition in agriculture is:

$$PX = \frac{1}{1+\alpha} Y(L_Y, \bar{K}_Y) \tag{8}$$

The distribution of Y is as follows: the industrialists and landlords in the agriculture demand Y, who have marginal propensity to consume c_1 and c_2 respectively out of their profit incomes. None of them consume any X. Finally, Y is demanded for investments (I) by the industrialists and this investment is a function of the land available to them. Greater the land allotted to them by the government by diverting it from agriculture or say greater the amount of land purchased by them from the landlords, greater is the amount they invest in Y. The equilibrium condition in the industry is therefore:

$$Y(\cdot) = c_1\left(\frac{\alpha}{1+\alpha}\right)Y(\cdot) + c_2(PX(\cdot) - WL_X) + I(l_Y) \tag{9}$$

Where the argument of the in the I function denotes the land available to industrialists for investment purpose. Finally the land constraint is:

$$l_X + l_Y = \bar{l} \tag{10}$$

Now, equation (8) gives the equilibrium combinations of X and Y that keeps the agriculture sector in equilibrium and equation (9) gives pairs of X and Y that yield equilibrium in the industry. In X-Y quadrant, the former (shown by AA) slopes upward while the latter (shown by II) slopes downward. This is shown in

figure 1, where initial equilibrium is denoted by e_0.

3. Diversion of Land from Agriculture to Industry

Let us now analyse the effect of diverting agricultural land from agriculture to industry. Since, the amount of total land availability is fixed in the economy; clearly, there is a production loss in the agricultural sector. On the other hand, availability of land to the organized sector boosts up investment in the organized sector. Hence, the organized sector expands. This is illustrated in figure 1. The II curve shifts outward from II_0 to II_1 as availability of land boosts up investment, increasing the agricultural demand. Since output is demand determined, aggregate supply of Y increases. Regarding the effect on agriculture, reduced availability reduces output, and AA curve shifts inward to AA_1on the other hand increase in Y leads to increase in labour employment in the industry. Thus, total wage-bill increases. Since supply of agriculture decreases while demand increases, there is food inflation. Due to the mark-up pricing in the industry, price of Y does not decrease even after higher production of Y. As a result overall inflation in the economy increases.

Mathematically we can show this by differentiating equation (8) and (9) w.r.t. l_y. The two equations are:

$$\frac{\partial V(\cdot)}{\partial l_Y} = \left(\frac{(1+\alpha)}{\alpha s_1 + s_2}\right)\left[\frac{\partial I}{\partial l_Y} - c_2 W \frac{\partial L_X}{\partial X}\frac{\partial X}{\partial l_X}(-1) - c_2 L_X \frac{\partial W}{\partial X}\frac{\partial X}{\partial l_X}(-1)\right] > 0 \tag{11}$$

$$P\frac{\partial X}{\partial l_Y}(-1) + X\frac{\partial P}{\partial X}\frac{\partial X}{\partial l_Y}(-1) = \frac{1}{1+\alpha}\frac{\partial Y}{\partial l_Y} \tag{12}$$

Since the term in the square bracket given in expression (11) is positive, the sign in (11) is positive. Arranging (12), and using (11), we get

$$\frac{\partial X}{\partial l_Y} = \frac{\frac{-1}{1+\alpha}\frac{\partial Y}{\partial l_Y}}{P + X\frac{\partial P}{\partial X}} < 0 \tag{13}$$

As a result, we can conclude that the development policy of many LDCs like India of diverting agricultural into industrial units is not only leading to contraction in the agriculture, but also leading to unemployment in the unorganized sector. Moreover this process is clearly inflationary. What it boils to saying is that, we are placing higher and higher amount of income in the hands of only a small section of the population. Thus, we are actually increasing inequality by pursuing a development regime like this.

4. The Indian Experience

Here, we quote some of the Indian experiences of recent times. India has off late been a classic example of devising a road-map of this kind of development strategy. Forceful acquisition of land from agriculture to industry has been pursued in places like Singur, Nandigram and in Orissa. Diversion of land in these places have even led to blood-shed of many peasants as well as change in political regime of state. In India, the land-man ratio in the country has decreased from 0.38 in 1967-68 to 0.15 in 2005-06, implying greater "urbanisation" as well as higher incidence of unemployment in agriculture. The problem with urbanisation is that these industries are high-tech industries which have higher capital-labour ratio. Therefore, forward linkage is not created and incidence of employment continues to enlarge. Table 1 testifies this fact. Moreover, in India, the government policy has put higher and higher income in the hands of only a tiny part of the Indian population. This is evident from the fact from that share of unorganised sector in NDP has decline (see table 1). Therefore, the India-shinning story has been iniquitous and definitely is unsustainable in the long-run.

5. Conclusion

In this paper, we bust the myth of trickle-down effect as often advocated by the policymakers. The claim that higher pace of industrialization will lead to trickle down effect is not the case at all. Since expansion in the industrial sector is not labour intensive, unemployment increases even in the organised sector. Moreover, reduced land-availability in the agricultural sector leads to higher unemployment in this sector as well. The correct development strategy is the one that puts higher and higher income in the hands of a large section of the population, the strategy of diversion of agricultural land for industrialization is definitely the wrong strategy.

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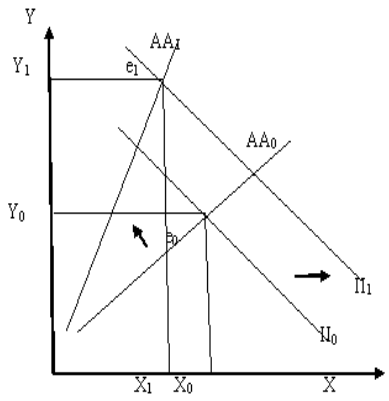

Figure1. Effect on Land Diversion from Agriculture to Industry

As land is diverted from agriculture to industry, output of industry increases while that of agriculture decreases.

Table 1. Employment and Unemployment in India

Category	(Million)			
	1983	**1993-94**	**1999-00**	**2004-05 (in 000 persons)**
India				
Population	718.2	894.01	1003.97	1092830
Labour Force	261.33	335.97	363.33	419647
Workforce	239.57	315.84	336.75	384909
Unemployment Rate (%)	**8.3**	**5.99**	**7.32**	**8.28**

Source: *Indiastat*

Unemployment in India has increased over the years, despite faster growth of industries.