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TACKLING AGRICULTURE IN A DEVELOPING COUNTRY: A PROPOSAL FOR INDIA

Indira Rajaraman

Abstract

More effective taxation of agriculture is central to the development issue. An OLS cross-country regression across developing countries shows that every one percent increase in the share of agriculture in value addition lowers the tax/GDP ratio by a little over one-third of one percent, after controlling for shares of imports and services. The paper goes on to argue that agriculture can become possible, if never easy, to tax if it is attempted at the lowest, local level of subnational government. The information vacuum that confounds any attempt to tax agriculture is least formidable at local level, and compliance incentives exist when taxes paid are seen to feed into provision of productivity-enhancing local public goods. The paper provides a feasible design for a simple norm-based crop-specific tax on agricultural land leviable at local level, and provides estimates of the levy range for different regions of India. The recommendation carries general validity even for non-federal developing countries, provided local government institutions exist in rural areas, analogous to those in cities.

JEL Classification: H71, Q10

Keywords: hard-to-tax; agricultural taxation; local government.

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I. INTRODUCTION

Agriculture is commonly rated the hardest to tax of all hard-to-tax sectors.¹ This is universally the case, principally on account of the spatial spread of the activity and the need for state-contingent levies, given the intrinsic vulnerability of agriculture to external weather-related shocks. Both conditions become further confounded in the developing country context. Two additional difficulties in the developing world are the absence of standard account-keeping, and the practice of payments in cash or kind, not routed through banks even where the banking system does extend into rural areas. Together, these make for an information vacuum in which self-declared incomes are impossible to verify except in the context of plantation agriculture.

The difficulty of taxing agriculture does not matter in developed countries, where agriculture accounts for a minor share of GDP.² It does matter however in developing countries like India where agriculture still accounts for 25 percent of GDP (Economic Survey 2002-03). The average tax/GDP ratio in the OECD club stands at 37 percent (OECD Revenue Statistics). Even countries at the low end of the OECD spectrum, such as Japan and Korea, have tax/GDP ratios at around 25 percent. As compared with that, India has a tax/GDP ratio, aggregating across Centre and states, at around 15 percent of GDP. If countries in this class aspire to shares of public expenditure in GDP comparable to those found at the low end of the OECD spectrum, they would run fiscal deficits of the order of 10 percent of GDP, and that is exactly the case in India today.

¹ The three hard-to-tax sectors are conventionally taken to be small business, services and agriculture, in ascending order of difficulty, although all components of the hard-to-tax are not necessarily small (Bird, 1983).

² Agriculture in the 30 countries of the OECD receives a net subsidy amounting to 3.9 per cent of total revenues (OECD Agricultural Outlook and Revenue Statistics). The share of

The difficulty of taxing agriculture thus is more than just a piquant fiscal footnote. It leads to an insufficiency of public revenues in the very regions of the world where public goods are chronically under-supplied. Taxing agriculture more effectively therefore becomes central to the development issue. Aside from leading to revenue additionality in the fiscal system in aggregate, which is desirable in itself, it will move taxation towards better cross-sectoral parity, and hence improve the efficiency of the tax system.

On the need for taxing agriculture effectively, there is overwhelming agreement among economists from the time of Ricardo. The uniform endorsement of the need for effective taxation of agriculture in developing countries in particular contrasts strangely with the reality that no developing country "utilized the undoubted potential of properly constructed agricultural taxes as part of a conscious development policy as well as to raise revenue" (Bird, 1974:41).

In the event, other non-transparent means of implicit taxation were substituted, through the classic policy of import-protected industrialisation. This raised the price of industrial goods consumed by the agricultural sector well above world prices, while agricultural prices remain at (or below) world prices; and by restricting imports led to overvalued local currencies and thereby lower earnings in domestic currency from agricultural exports.³ This then led to pressure for subsidised inputs for agriculture, and thus to the maze of price distortions the unravelling of which is the core of the typical programme for structural adjustment and reform in developing countries. Input subsidies tend to be sticky and typically survive the reversal of implicit taxation.

tax revenue sourced from agriculture is not known, but is unlikely to exceed 3.9 per cent, implying negative net taxation of agriculture.
³ See Bautista, 1986 and Schiff and Valdes, 1992.

As long as implicit taxation interlocked with appeasement through subsidy remains in place, explicit taxation of agriculture will be difficult to introduce. The correction of these price distortions cannot be smooth or instantaneous. During that process there must gradually be brought into place a transparent mechanism for explicit taxation of agricultural incomes without, however, any of the historical insistence on the need for transferring resources out of agriculture. The last is especially important.

The need for within-sector retention of any resources raised from agriculture for infrastructure development and productivity-enhancing land improvements within the sector carries an economic efficiency justification (Newbery, 1992), and is key to inducing voluntary compliance with an agricultural tax. Investigations of the joint growth and poverty outcomes of alternative macroeconomic policy configurations point to the centrality of rural infrastructure, and road connectivity in particular, for poverty-reducing growth (Fan, Hazell and Thorat, 2000).⁴ The agriculture sector is the one sector where the link between growth and poverty reduction is empirically established (Ravallion and Datt, 1996).

Jurisdictional retention, along with reasonable rates of levy, and systematic provision for catastrophe exemption, should make it possible to overcome the compliance resistance to agricultural taxation.

The ineffective taxation of agriculture in the developing world has in part resulted from the form of taxation attempted, typically a modern income tax based on self-declaration, symmetrical to that used for industry. This is despite the mainstream consensus in the literature on the need to approach taxation of agriculture through a presumptive norm-based levy on land, in proportion to potential output (Ahmed and Stern 1989; Rao 1989). This is what has led to

⁴ See also Newbery, 1992, Bhalla and Singh, 2001, and Ahmed and Hossain, 1990.

asymmetry of revenue outcomes between industry and agriculture. It is also argued here that the revenue insignificance of agricultural taxation has in part been because it has been attempted at the wrong level of government. It is at the level of local government that the information costs advanced (Skinner, 1991 and 1993) as a possible explanation of why even land-based taxation of agriculture has failed as a serious revenue source despite its undoubted efficiency advantages, are most easily overcome.

The twin difficulties posed by agriculture are the need to evolve norm-based methods for administrative feasibility, while at the same time retaining the flexibility to accommodate legitimate external shocks so as to approximate to the risk-sharing properties of conventional income taxation. A land tax which does not carry some catastrophe exemption provision for negative external shocks, whether idiosyncratic or non-idiosyncratic, is inequitable, and would not find widespread acceptance in practice.

Thus, with the appropriate form of taxation levied at the appropriate level of government, jurisdictional retention of revenues, reasonable rates of levy, and a systematic catastrophe exemption provision, agricultural taxation should be feasible in an efficient and equitable manner.

In what follows, section II performs a cross-country regression to examine whether there is empirical evidence on an inverse relation between the tax/GDP ratio and the share of agriculture in aggregate value addition within the class of developing countries, as distinct from that clearly evident across all countries, developed and developing. Section III examines the prescription in the literature for the efficacy of land-based taxation of agriculture, and examines Indian experience with respect to agricultural taxation in that light. Section IV sets out the design for a feasible crop-specific levy that is parsimonious in the recurring information requirements for assessment, and adapted to skill levels typically found at local levels of government in developing countries. Section V sketches

very briefly the case for assignment of rights of levy of land taxation of agriculture to the local level of government. Finally, section VI concludes the paper.

II. IS AGRICULTURE HARD-TO-TAX: CROSS-COUNTRY EVIDENCE

Agriculture accounts for a higher share of value addition in the economies of developing countries, and is undoubtedly a major reason for lower tax/GDP ratios relative to those in the developed world. There are clearly however other contributory reasons, such as the better tax administration, penetration of the banking system, and an all-round better institutional framework for monitoring and verification.

This section reports the results of a simple cross-country regression within the class of developing countries to see if, holding the institutional framework broadly constant, there is a statistically significant relationship between share of agriculture and tax/GDP ratio.

The results are reported in table 1. The basic data were sourced from World Development Indicators (WDI 2001) for a final set of 70 developing countries, and are averaged for each variable across the (calendar) years 1994-95. A two-year average was taken to iron out single-year anomalies. The period was chosen so as to maximise data availability, with the series for some countries such as the Russian Federation and Belarus not beginning until the mid-nineties, and for some others not extending beyond the mid-nineties to more recent years. Even so, data for some variables and countries had to be sourced from adjoining years before 1994 or after 1995.

The selection of countries was dictated by availability of tax revenue data from the source used, for which reason alone 93 developing countries had to be excluded (Bangladesh, Tanzania and Nigeria surprisingly among them). From

among the set for which tax data were available, the developed countries were excluded, which essentially meant an income truncation point at \$10000 per capita, converted into U.S. dollars from local currency units at constant 1995 exchange rates. Within this cut-off income level, oil-producing countries of the Middle East were also excluded, because these are countries which typically rely on non-tax oil revenue rather than on taxes. Iran and Oman for example had a tax/GDP in the 7-8 per cent range. A few countries (Maldives for example), had no data on sectoral shares in GDP. The final set of 70 countries ranges, in average GDP per capita over the years 1994-95, from 101 in Ethiopia, to 9236 in Slovenia.

The WDI data on taxes, although they do not explicitly say so, are clearly from the evidence of the numbers confined to taxes collected by national-level governments. These therefore had to be corrected using data on tax revenues of subnational governments from the Government Financial Statistics Yearbook of the IMF for the same years. This correction was applied to 23 out of the 72 countries. The correction factor ranged from a low of 1.02 for Kenya, to more than 2 for China, the Russian Federation and Argentina.

The data source clearly had only the aggregate share of agriculture in GDP at factor cost, with no supplementary data on the share of plantation agriculture. As will be seen in the next section, agriculture is not uniformly hard-to-tax. Plantation agriculture in developing countries is among the easiest-to-tax sectors, as easy as organised manufacturing. Indeed plantation agriculture is integrated with manufacturing in the case of tea plantations, for example, where the final product of the plantation emerges only after processing. It did not prove possible to decompose the share of agriculture into the hard-to-tax core, which is non-plantation agriculture. This will clearly bias the estimated coefficient of the agriculture term.

In addition to agriculture, the specification included the share of the service sector, also rated as hard-to-tax. Here again, as in the case of agriculture, there are some easy-to-tax segments, like government service and modern professional services. A partitioning along these lines is not easy to do for a large set of developing countries. What was certainly clear from casual inspection of the data is that there is clear underestimation of services particularly in countries presently under Communist rule, such as China and Albania, where GDP measurement traditionally carries a focus on the material product alone.

Thus, the sectoral shares carry a large noise component, both because of the inability to partition out the hard-to-tax components of the GDP in a fine-tuned way, and because of inherent definitional and conceptual unevenness in measurement across the set of developing countries.⁵

The final specification was a simple single-equation cross-sectional regression of tax/GDP in percentage terms on shares of agriculture and services as a percent of total value addition, after controlling for the share of imports in GDP. Import tariffs are traditionally the easiest sources of revenue in developing countries, and the import share serves also as a control variable for size of country. The variable was not defined as exports plus imports, because structural adjustment programmes in the eighties have all but eliminated export taxation in developing countries (see FAO, 1993 and Rajaraman 2003a).

The results are shown in table 1. The signs of all the terms accord with prior expectation. The coefficient of the agriculture term is negative and significant at the 0.2 percent probability level, and shows a fall by a little over a third of one percent in tax/GDP for every rise by one percent in the share of agriculture in GDP. The coefficient of the services term is also negative, but is

⁵ Details on the measurement deficiencies of GDP in India can be found in the Report on the National Statistical Commission (Government of India, 2001).

not statistically significant. Finally, the share of imports in GDP carries a positive coefficient, with statistical significance at the 0.05 per cent level. The estimated equation explains only one-third of the variation in the dependent variable, but even that is impressive given the noise level in the data. There are other clearly important factors bearing on tax/GDP ratios found in the developing world, such as for example, the importance of the mining sector. Mining, like large-scale manufacturing and imports, offers the advantage of a small number of high-value taxable points.

Table 1
Impact of sectoral shares on tax/GDP ratios of developing countries

Dependent Variable: Tax/GDP (%)		70 countries		
Average: 1994-95		(GDP per capita < \$10000)		
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	27.52	9.01	3.05	0.0033
Agriculture/GVA	-0.35	0.11	-3.19	0.0022
Services/GVA	-0.12	0.14	-0.87	0.3868
Imports/GDP	0.18	0.05	3.67	0.0005
R-squared	0.35	Mean dependent var		21.99
Adjusted R-squared	0.32	S.D. dependent var		9.95
F-statistic	11.89	Prob(F-statistic)		0.000003

Source: Data from WDI, 2001, supplemented by IMF, Government Finance Statistics Yearbook.

Clearly agriculture acts as a depressant on tax/GDP. The centrality of this constraint on public goods provision in the very countries desperately indeed of public goods, has simply not been given the attention it deserves in the development literature.

III. LAND-BASED LEVIES: THEORY AND INDIAN EVIDENCE

The exemptions necessary to keep a conventional income tax on agriculture state-contingent, but which at the same time are difficult to verify in the absence of standard account-keeping, and with prevalence of cash transactions, are what make such levies administratively feasible only in the plantation or other large-holding context. As will be seen in the brief account of Indian experience with agricultural taxation in this section, even income taxation of plantation agriculture has evolved over time towards norm-based methods.

A norm-based presumptive approach to taxing any activity, involving assessment of taxability independently of self-declaration, calls for:

- The identification of objectively measurable indicators specific to each sector or economic activity, which in the case of agriculture will clearly be land sown, and the use of these to establish not merely taxability, but also the taxable income generated per unit of the chosen indicator/s.
- The need for robust survey-based norms linking taxable income to these observed indicators.

Presumptive approaches are efficient, because the whole of income corresponding to incremental effort above the norm, accrues to the economic agent (Sadka and Tanzi, 1993). In the case of agriculture, in particular, the essential productive asset, land, is in fixed supply, and unequally distributed. Therefore a fair tax based on potential returns to land is both efficient and equitable. A levy explicitly related to the income stream generated is by definition related to ability to pay, unlike valuation-based levies on land as

wealth.⁶ *In rem* levies, on land regardless of ownership characteristics, are less informationally demanding and therefore administratively simpler than *in personam* levies, based on the assessee, by land ownership characteristics.

A land-based tax bears clearer jurisdictional markers than a tax on output or exports of the kind advanced by Hoff, 1991 and Hoff et.al., 1993, and is for that reason recommended here. Since the incidence of an output tax falls in long-run competitive equilibrium on the consumers of agricultural products in proportion to their consumption, an output tax is more an indirect tax suited to levy by higher levels of government rather than a replacement in any sense for the within-sector generation of revenues that a well-designed land tax makes possible. A land tax helps to establish a jurisdictional link between taxes paid and public goods provided, and therefore carries externalities in terms of collective consciousness extending far beyond revenue collected.

India has had an income tax since 1886, one of the earliest countries to introduce it, but agricultural income was excluded from its ambit, since there was already in place a land-based levy called the land revenue. Much later, the need to have an income tax on agriculture was recognised, and rights of levy legislatively assigned in 1935 to subnational governments of what were then termed Provinces, now States. This separation of powers continues under the Constitution of independent India.⁷ There is however a definitional separation of livestock and other non-cultivation rural activities from cultivation, so that what is excluded from the income tax at the national level of government (Central government) is agricultural cultivation alone.

⁶ See Davey, 1999, who advances that as a reason for the rise in income and transaction taxes as sources of revenue in the OECD world; and also Rajaraman, 1997.

⁷ Under section 10(1) of the (presently operative) Income Tax Act of 1961, supported by the constitutional separation of taxation powers under Article 246, in conjunction with Entry 46 in List II of the Seventh Schedule. However, the separation of powers between Centre and States is not complete. Under the Central income tax, assesseees are required to declare agricultural income, for determination of slab rates of income tax applicable to non-agricultural income, in what is called a partial integration provision. Also, agricultural

The land revenue remains in place in most states, although some agriculturally prosperous States like Haryana and, more recently, Punjab, have abolished the land revenue.

The agricultural income tax by contrast is far less universal, although the right to levy it is uniformly granted to all states. There has been a reduction over time in the number of states levying an agricultural income tax,⁸ to only six States which have plantation agriculture (Assam, Karnataka, Kerala, Tamil Nadu, Tripura and West Bengal); and in the number of taxable crops from what in earlier years was a much larger set.⁹ Tamil Nadu was the last state to drop taxation of non-plantation crops. Figures for 1991 which was the last year when both were covered, show that non-plantation crops accounted for 85 percent of the workload, but only 5 percent of total revenue collected (Acharyulu, 1991).

With the exception of Assam and Tripura, none of the states with an agriculture share in GDP at 40 per cent or more levy an agricultural income tax.¹⁰ Thus the experiment in levying an agricultural income tax spanning a period of four to five decades shows a natural evolution to a taxable set of plantation crops alone. It is clear that plantation agriculture, which of all agricultural activity is closest to manufacturing in its larger scales of operation, formal records of accounts, and links to the banking system, is the only activity within the agriculture spectrum that has proved revenue-productive through a conventional tax based on self-declaration.

land has been included for assorted periods in the past in Central taxation of wealth and capital gains, and the cessation of these was not precipitated by legal defeat.

⁸ The Raj Committee Report in 1972 lists a total of eleven states then levying an agricultural income tax.

⁹ In Kerala, paddy and other field crops were excluded from 1 April 1981. Further exclusions of sugar and orchard crops like mango were added on in 1986. The Karnataka confinement to plantation crops dates from 1 December 1982.

¹⁰ These are Sikkim, Jammu & Kashmir, Punjab, Rajasthan, Tripura and Uttar Pradesh.

The combined yield from land revenue and the agricultural income tax in 2000-01, the most recent year for which figures of collections¹¹ across all states are available, amounted to a mere 0.6 per cent of total national tax revenue aggregating across Centre and states; and 1.5 per cent of tax revenues collected by the states. Land revenue accounted for over 90 per cent of the total. When land revenue on non-agricultural land, such as the West Bengal cess on coal mines, is excluded, the contribution to national tax revenues drops to 0.4 percent.¹²

State governments have had no interest in restructuring the land revenue to improve its buoyancy because the revenue from the levy is shared with rural local governments (panchayats), fully in some States, partially in others (Rajaraman, et.al., 1996). This did not at the same time give local governments a stake in improved collections, since the sharing of revenue was most usually not by origin, in terms of jurisdiction of collection, but by formula. The formula was most usually a uniform per capita sum, or some other such with redistributive intent. This left neither the receiving nor the levying government with a stake in improved collections. The laws in place restrict the minimum period between rate revisions to as much as thirty years, and in practice much longer.

However, the need to find additional resources for local governments after they were granted Constitutional status as a third tier in the federal structure of the country through the 73rd Amendment in 1992 is undoubtedly what has driven the rate revisions visible in the nineties. At the same time however there have been retrograde moves, with Punjab repealing the land revenue in 1997, adding one more to what were previously five states not levying land revenue. Haryana stopped levying land revenue in 1986. These two states have the highest agricultural productivity levels in the country.

¹¹ Revised estimates, which may differ from the final figures of actual collections.

¹² This was possible to do only for 1996-97, for which a breakdown of land revenue by sub-heads of account was available; it is not routinely reported for all years.

In response to repeated expressions of dissatisfaction with the poor yield of agricultural taxation in India in official documents and by academic economists, a Committee on Taxation of Agricultural Wealth and Income (the Raj Committee) was appointed in 1972. The principal recommendation was a progressive agricultural holdings tax (AHT) on agricultural income, defined to *include* income from livestock, fisheries, poultry and dairy farming. The AHT was norm-based, calculated from regional average crop yields, but its critical defect was the attempt at universal coverage of all crops, which required information on the cropping pattern of each cultivator in each assessment year. Levy rates varied progressively by holding size.

Not surprisingly, the recommended tax was not implementable. This failure marks a major hiatus in the attempt to tax agricultural income in the country, because it placed the final seal of political impossibility on the entire issue.

What is important and relevant at this point in time is that the original exclusion in 1886 of agricultural income from taxability was predicated on land revenue being of "comparable magnitude" to the income tax. That this had ceased to be the case even by 1935 was what led to the assignment to the states of the right to tax agricultural income over and above land revenue. The revenue failure of state-level taxation of agricultural income provides the basis for reopening the issue today.

With only plantation agriculture amenable to the agricultural income tax, states have tended to overtax plantations to compensate for their inability to tax non-plantation agriculture. The *lowest* slab rates for corporate assesseees lie between 40-50 per cent (with the single exception of Karnataka at 30 per cent). In the highest income slabs, tax rates on *total* income are in the 60-65 per cent range in three of the six states, albeit with a cap on the marginal slab rate at 80 per cent in two of the three. These are much higher than the present-day

(uniform) 35 per cent rate of levy under the Central corporate income tax (excluding surcharges, which vary by year).

This and other anomalies, such as the exemption for export income (now on a phase-out starting April 2000) under the Central corporate income tax which is not granted under the state-level tax have given rise to pressure from the plantation companies for agriculture to be brought under the Central income tax.¹³

Three of the six states which presently levy an agricultural tax have only tea plantations. Since tea is sold only after further manufacturing processing, the taxable base for the agricultural income tax is a fixed¹⁴ proportion of value addition at the manufacturing stage, as assessed for the Central Income Tax authorities. That in effect leaves only three of the six states with independent powers of assessment.

All three states presently levying a tax on agricultural income independently of the Central income tax have a presumptive option, whereby progressively slabbed specific rates in rupees per unit (acre or hectare) of land are payable as an alternative to regular assessment, and independently of actual production. Thus, the alternative of rates per land unit, either flat or slabbed by holding size, have been known and on offer wherever serious attempts have been made to tax agricultural income in the country. Details on these schemes are summarised in table 2.

The popularity of the compounding option will clearly be a function of how the slabbed rates per hectare compare with regular assessment rates, but as the figures in table 2 show, only a small per cent of those eligible do not opt for it. Two of the three states presently require that the presumptive option once

¹³ Further supported by a recent government report; see Government of India, 2003.

¹⁴ Limited to 60 per cent of total value addition.

exercised remains in force for three years, and cannot be independently opted for every year. If that were the case, assesseees would opt for presumptive payment only during years of upside variation in returns, so that the flat rate would in effect cap the revenue realisable per acre. However, the three-year commitment becomes inequitable in the event of a negative shock (whether idiosyncratic, i.e. specific to the farmer, or non-idiosyncratic, i.e. extending to a whole region).

Table 2

Presumptive Options to the Agricultural Income Tax on Plantations

Name of Scheme	Composition	Compounding	
	Karnataka	Kerala	Tamil Nadu
Eligibility			
Ceiling	20ha	500ha	20ha
Floor	6ha	3ha	3.2ha
Crop-specific	No	Yes	No
Number of rates	..	8	..
Ratio highest/lowest rate	..	3.38	..
Assesseees opting (1998-99) (% eligible)	86	72	100

Source: Rajaraman, 2003b.

Notes: These are the present-day features of the schemes on offer. The confinement of the agricultural income tax to plantations occurred at various points in time in the three states; the last was Tamil Nadu in 1991.

This underlines the twin difficulties of taxing agriculture: the need to evolve other than accounts-based methods for administrative feasibility, while at the same time retaining the flexibility to accommodate legitimate external shocks. Any scheme for taxation of agricultural income has to carry some systematic

provision for catastrophe exemption in a country where agriculture is still largely rain-dependent (and indeed, even in countries where it is not).

Thus the revealed evidence over time shows, in accordance with expectations, the evolution of the agricultural income tax in the direction of a land-based levy, away from the system of assessment based on books of accounts because of its unsuitability to agriculture as an activity.

Even for the regular assessment route, all three states have crop-specific norms in respect of yield, cost of cultivation and net income per hectare which serve as benchmarks for assessment.

The land revenue over much of the country is also presumptive in conception, in that it is related in principle to average returns to the land. The actual relationship between levy and land productivity may be seriously lagged, inadequately stratified, or otherwise deficient, but the principle underlying the levy has always, historically and presently, been the productivity of land, however that productivity might have been assessed. Thus, presumption in the agriculture context is widely based in practice, and voluntarily opted for wherever it is an alternative to regular assessment.

IV. THE DESIGN FOR A FEASIBLE CROP-SPECIFIC LEVY

It is clear that the principle of norm-based presumption of income from land is known and currently on offer in India, so that a more widely-based presumptive scheme for taxation of profitable crops should pass the test of legal and assessee acceptability.

The land-based levy recommended here has necessarily to be crop-specific since returns to cultivation are not equalised by cropping pattern shifts, even within a homogeneous agro-climatic region. Any of a number of barriers to

entry, ranging from factor-specificity to imperfections in credit markets can prevent factor shifts to the most profitable crop in a region.

Specification of norm-based crop-specific levies per hectare calls for a taxable surplus parameter as follows:

$$\psi_{ij} : [TR-TC]_{ij} / TR_{ij}$$

where

- ψ = taxable surplus parameter
- TR = total revenue
- TC = total cost
- i = crop
- j = state/region

A parameter of this type clearly calls for stability in the cost-revenue relationship. If there is no stability over any range of the observed cross-sectional yield domain, the crop is quite simply not amenable to norm-based taxation. This further requires that the parameter must be defined with respect to a reference yield, or yield range.

Even if there is stability in the underlying relationship between input use (and hence total variable cost) and the targeted yield, stability with respect to observed yield will obtain only if there is reasonable conformity between targeted and observed yields. This conformity would not exist at very low levels of observed yield, nor possibly at very high levels. Thus, stability in the cost-revenue ratio may reasonably be expected only above some threshold yield (TR), below which observed yield is too low to fall within the targeted range.

The surplus parameter ψ_{ij} can then be applied to any current year, t, to obtain an estimate of the taxable surplus and thereby the levy admissible for the ith crop in the jth region as follows:

$$TR_{ijt} = Y_{ijt} \times P_{ijt}$$

$$L_{ijt} = r \times \psi_{ij} \times TR_{ijt}$$

$$R_{ijt} = L_{ijt} \times A_{ijt}$$

where

$$t = \text{year}$$

$$TR; Y; P = \text{Total farm revenue per hectare; yield per hectare; price}$$

$$r = \text{rate of levy on taxable surplus}$$

$$L = \text{absolute levy in Rs/hectare}$$

$$A = \text{Area (in hectares).}$$

$$R = \text{Total tax revenue}$$

The only recurring information required for assessment purposes is:

1. A listing of cultivators growing each of the crops in the selected subset for each season;
2. Identification of those cultivators in each list whose yields fall below a stipulated exemption yield (failure) threshold.

The further informational advantages of *in rem* as opposed to *in personam* levies is that no information is required on the total holding of the cultivator, nor indeed on whether he is an owner or a lessee.

While average returns to crop may differ on account of factor-specificity, it is clearly possible that there could be crop-substitutability at the margin. Thus a levy based on average returns could lead to some distortionary movements at the margin into crops with a lower tax. It is difficult to estimate the possible distortion on this account. Indian agricultural policy has had such a distortionary impact, resulting from the setting of minimum support prices for the major foodgrain crops, that the impact of crop-specific levies might actually be corrective of those other distortions. Agriculture the world over is in general

characterised by price interventions of this kind more than other sectors of economic activity.

The crop-specific supplementary levy recommended here is specified per acre sown to a particular crop, not with respect to total income from a crop, aggregating across acreage sown to it. Following from this, there is no acreage threshold. But there is a need for a taxable threshold per acre, specified in terms of crop yield, a readily observable indicator, rather than net income, which is not readily observable. If input subsidies presently in place are reduced in the process of fiscal reform, clearly the tax will need to be adjusted downwards. After the initial levy is quantified, subsequent adjustments of this nature are relatively simple to do.

Whatever the efficiency and equity properties that recommend agricultural taxation based on land, dealt with in the previous section, the key to successful implementation lies in its feasibility. Feasibility in turn requires three critical operational properties:

- parsimonious information requirements for assessment;
- systematic, as distinct from discretionary, provision for catastrophe exemption, whether specific to a farmer (idiosyncratic) or covering an entire tract or region (non-idiosyncratic);
- assessee acceptance.

The second facilitates the third, is particularly necessary in the absence of perfect risk markets, and adds to the equity properties of a levy that inherently suffers from information asymmetry between assessor and assessee.

Indian agriculture carries input subsidies, with nationally uniform (fertiliser) and cross-sectionally varying (water and electricity) components. Any changes in these will clearly alter the taxable surplus parameter and levy rates estimated. Correction of input prices in itself carries a potential growth dividend, given the

considerable evidence on declining soil productivity resulting from overuse of underpriced surface and ground water (Joshi and Tyagi, 1991). Indeed there is a possible trade-off between the crop-specific tax as initially specified with input subsidies in place, and a lower tax subsequently specified in a package with corrected input prices, which can be used to gain taxpayer acceptability in a mutually reinforcing sequence, with jointly favourable growth and fiscal outcomes. Eventually, with agricultural income having been raised by the productive use of the initial tax revenues, the tax could be restored, and further enhanced, for subsequent rounds of improvement to agricultural infrastructure. Clearly, for all these corrections to be possible, the design of the tax has to be sufficiently simple in a computational sense for a re-setting of its value to be easily possible.

Acceptability is of the essence for voluntary compliance with an agricultural tax. Even where the crop-specific levy rates per hectare are based on field surveys, the relativities have to accord with the local ordering in terms of profitability. There cannot be any national uniformity in this respect nor indeed should such uniformity be sought. The essential difference between the scheme recommended here and the failed AHT is that no attempt is made to find a universal substitute for the land revenue presently in place. The cross-sectional pattern of relative rates of land revenue can be left untouched, with the absolute rates themselves reset if need be at their indexed value.

Although there could in principle be a nationally prescribed list of taxable crops, there will be variation across regions in respect of which crops, from among this list, is actually chosen for taxation. In a country as agro-climatically diverse as India, productivity variations can be so wide as to straddle a crop on either side of the taxable income threshold across regions. Even if a nationally uniform crop list is prescribed, there cannot possibly be uniformity across regions in rates of levy per acre sown to the crop.

There are two ways by which to generate the data needed to estimate the taxable surplus parameter. The first, and certainly the first-best, would be to conduct region-specific field surveys. Field surveys carry the advantage that cross-sectional data across cultivators can be used to identify the threshold defining the lower limit of the stable cost-revenue domain, which can then serve as the reference yield and also as the catastrophe-exemption yield, below which the cultivator will be exempt from having to pay the tax. The operational advantage of a taxable threshold so obtained is that it is independent of yield averages and therefore does not need redefinition over time.

Empirical evidence from a study of returns to three commercial crops in Northern Karnataka (Rajaraman and Bhende, 1998), shows a difference by a factor of as much as 18.6 between the highest and lowest return crops on irrigated land; and, surprisingly, a lower factor of 13.9 between the highest return crops on irrigated and rainfed land. An interesting finding of the field survey was that the highest-return crop had the lowest coefficient of variation in yield of 0.39. This may always be so, if the underlying production function permits of minimisation of the damage caused by any given exogenous vagary by application of more inputs. The coefficient of variation of cost is much lower than that for revenue for each crop, and between crops is once again lowest for the highest return crop, as low as 0.09. This once again suggests the existence of a best-practice input package, which minimizes downside risk, and which is most uniformly approached for high-valued crops where the higher expected return justifies the incremental cost.

The scheme suggested here trades off simplicity at the expense of some regressivity among cultivators falling above the threshold yield. A levy specified at a uniform percentage of total revenue above the threshold would be more equitable, but will require information on the exact quantum of yield obtained by each cultivator and will therefore be harder to implement. A workable tax design for panchayats has to be simple in design.

The second, and second-best, basis on which to construct taxable surplus parameters, is secondary data from official surveys, which are done everywhere as part of the national income estimation exercise. If these yield data on cost of cultivation, even if only average figures for a region or subnational unit, they can provide a basis for construction of the taxable surplus parameter. The disadvantage of basing the parameter on average regional crop yields, is having to deal with the issue of whether the taxable surplus parameter calls for redefinition over time, and how this is to be done.

Two approaches are possible. One is through simple application of the unadjusted taxable surplus parameter obtained at the anchored average yield for the years for which cost of cultivation data were available. Alternatively, if the surplus parameter itself is to be adjusted to crop yield variations, a set of coefficients, β_i for the i^{th} crop, will be needed thus :

$$\Delta \psi_{ijt} = \beta_i \Delta \text{Yield}_{ijt}$$

where

$\Delta \psi_{ijt}$: Difference for the i^{th} crop in the j^{th} region between the taxable surplus parameter for the t^{th} year and the base parameter

$\Delta \text{Yield}_{ijt}$: Difference for the i^{th} crop in the j^{th} region between current yield in t^{th} year and the anchor yield.

The adjusted taxable surplus parameter for yield rates different from the anchor yield can be obtained thus:

$$\psi_{ijt}^a = \psi_{ij}^b + \Delta \psi_{ijt}$$

where

ψ_{ij}^b is the base or anchored parameter; ψ_{ijt}^a is the adjusted parameter for the t^{th} year.

Symmetric adjustment across yield changes around the anchor yield implies adjustment for all values of $\Delta \psi_{ij} > \text{ or } < 0$. Higher yields than the anchor yield offer a chance for raising larger tax revenue via a higher surplus parameter.

Asymmetric adjustment provides reprieve for yield shortfalls alone, with no enhancement for higher yields, and is done only for yields below the anchor yield, thus:

$$\begin{aligned} \psi_{ijt}^a &= \psi_{ij}^b + \beta_i \Delta \text{Yield}_{ijt} \text{ for } \Delta \text{Yield}_{ijt} < 0 \\ \psi_{ijt}^a &= \psi_{ij}^b \text{ for } \Delta \text{Yield}_{ijt} > 0 \end{aligned}$$

Asymmetric adjustment effectively presumes the anchor yield to be a threshold beyond which the surplus parameter stabilises.

If the taxable surplus parameter is based on regional yield averages from secondary data sources, the taxable threshold yield will also have to be specified independently. Risk markets for agriculture are not in general very well developed in the developing world, but in India, there is a crop insurance scheme, introduced in October 1999 covering the major cereal and commercial crops, providing cover for yield failure below a threshold set at a prescribed percentage, falling in the range 60-90 percent (termed indemnity rates), of a moving yield average. The prescribed percentage for setting of threshold yields are inversely related to crop yield volatility. Higher volatility goes with a lower percentage.

Not all state governments participate in the scheme, but the prospects are that participation will increase over time. Crop insurance is classically an area where market failure arises, not so much because of information asymmetry, but on account of the fact that exogenous risk is correlated across individuals in a

region (Duncan & Meyer 2000).¹⁵ This makes it possible to reduce risk through pooling through diversification across agricultural zones with non-synchronized exogenous shocks. In accordance with the recommendations that follow from the theory, the coverage of the scheme in India has steadily increased over the time, thus reducing risk within the pool. For the same reason it is certain that participation will increase over time.

The scheme is area-based, not therefore covering idiosyncratic risk. The prescribed threshold wherever it is available can however be used for idiosyncratic yield failure specific to an individual farmer as well. All insured farmers of the specified crop and area obtain compensation quantified thus: $((TY - Y)/TY) \times 100$, where TY is the area-specific threshold yield, and Y is the area-specific actual yield. The percent shortfall extends to all farmers in the area.

Thus the crop insurance thresholds provide the rudiments of a basis on which to specify exemption thresholds, in the absence of field surveys. This leaves only the need for a region-specific taxable surplus parameter for each crop, that can be applied as a constant to per hectare revenue each year to generate the levy per hectare for that year.

Progressivity is a major concern in India, and was a central feature of the failed AHT scheme of the early seventies, because 78 per cent of Indian agricultural holdings are less than 2 hectares in size, and only 1.6 per cent larger than 10 hectares in size (Rajaraman, 2003b). In the scheme designed here, progressivity is embedded in the variation across crops in levy rates per hectare. But the levy rate itself is scale invariant, as are the levy rates presently on offer as alternatives or supplements to the conventional assessment channel. A progressively structured rate structure by holding size only encourages fictitious ownership splits.

¹⁵ See also American Journal of Agricultural Economics, 2001 for a symposium on crop insurance; Jalan and Ravillion, 2001; and Newbery, 1993.

For India, an exercise (Rajaraman and Ghosh, 2002) was performed to generate taxable surplus parameters and levy rates per hectare using secondary data from Cost of Cultivation surveys, conducted by the Ministry of Agriculture for the construction of minimum support prices for the major field crops. The published data from these surveys are extremely uneven in coverage, in terms of years and crops cross states. Within these limitations, the surplus parameter was estimated at a reference (state-specific) yield anchored to some selected years for a set of eight field crops - paddy, wheat, groundnut, rape/mustardseed, sugarcane, cotton, potato and onion - for the mid-nineties, in a set of fourteen states overall.

The results are summarised in table 3 for the year 1996-97. The taxable surplus parameters were calculated for a triennium of three years in the mid-nineties, and were applied to crop yields averages at the level of each major state growing the crop for the year 1996-97, to obtain levy rates per hectare for that year.

At a 1 per cent rate of levy, the total tax revenue possible was Rs 4.9 billion in aggregate across the eight selected crops for 1996-97, subject to the limitations of state coverage in the data source. The total revenue amounts to 80 percent of the Rs 6.2 billion collected that year from land revenue on agricultural land. When the results were reworked with adjusted parameters, the impact on tax revenue was negligible in most cases. The final figures of aggregate tax revenue across the chosen crops and states showed only a roughly 3 percent difference between symmetric and asymmetric adjustment, and a fall of under one percent with asymmetric adjustment relative to the unadjusted levy (Rajaraman and Ghosh, 2002). These estimates do not make any deductions for cultivators experiencing yield failure that year.

Paddy and wheat yielded 60 percent of the total tax potential from the levy, because of the large area sown to these two crops.

Table 3

Summary Table of Tax Potential (1996-97) Computed at Tax Rate 1%

	No. of states	ψ (%)	GCA m.ha.	Tax payable Rs/ha.	Total tax revenue (Rs billion)
Crops					
Paddy	6	31.4-41.1	22.9	38-87	1.36
Wheat	6	34.4-50.6	21.6	52-116	1.72
Sugarcane	5	34.9-67.8	3.2	121-428	.65
Cotton	7	24.1-61.0	7.9	49-139	.57
Groundnut	5	18.1-42.4	5.6	20-72	.22
Rapeseed & Mustard	5	40.6-61.0	5.6	44-104	.36
Potato	1	24.6	0.3	103	.03
Onion	1	46.2	0.1	129	.01
Total			67.2		4.9

Source: Rajaraman, 2003b.

In the end, the feasibility of the tax proposed rests on the reasonableness of the levy rates per hectare. At a 1% rate of levy for the crop year 1996-97, the rates range between a low of Rs. 20 per hectare for groundnut in Maharashtra to Rs. 428 per hectare for sugarcane in Karnataka. For the two cereal crops, paddy and wheat, the levy ranges between Rs. 38 per hectare for paddy in Orissa and Rs. 116 per hectare for wheat in Haryana. Set against the higher ranges of present rates of levy of land revenue in states without plantation agriculture, of Rs. 48-85 per hectare, these rates are prima facie reasonable, and feasible. The agricultural income tax on plantations, works out as an average across exempt

and tax-paying holdings, to Rs. 415-2075 per hectare. The levy range of the crop-specific supplementary levy clearly falls towards the land revenue end of the spectrum, which is as it should be. Far higher levies can be contemplated for profitable horticultural sunrise crops not covered by standard cost of cultivation surveys. Since these newer crops are typically water-intensive, it is essential from both efficiency and equity perspectives that levies on these crops should be used to finance local watershed and other conservation programs.

The principal consideration to be kept in mind when using value addition figures from standard data sources is the definition of cost used. These will vary across countries. In general it is essential to ensure that costs include labour and managerial costs, both paid-out and imputed. The rental value of leased land is commonly included in cost where land is leased in, and imputed for own land. The latter signifies the cost foregone by not leasing out the land. However, in the context of tax potential, the rent foregone also constitutes a taxable income as it represents payment that the owner receives from himself rather than from a different lessee. Thus, while rental value of own land does constitute cost (and so should be subtracted from revenue to obtain surplus), it also represents taxable income to the farmer (and should be added back). The relevant cost specification for computing the taxable surplus is therefore one in which rental value of own land is not included. The impact of not deducting the rental value of land raised the taxable surplus parameter by between 16-30 per cent of total revenue per hectare.

The regressions investigating the functional dependence if any of the taxable surplus parameter on crop yield, were based on pooled data for all states for each crop. For any assessment year, there is a choice between using the unadjusted value of ψ , or adjusting it to the crop yield in the assessment year using the β parameter.

Table 4**Values of β_i**

Dependent Variable: ψ_i (%)		Pooled state-level averages		
Independent Variable: Yield _i (qtl/ha)		1990-98		
Crops	No. of obs.	β_i	(t-value)	\bar{R}^2
Paddy	30	0.264	(1.87)	11.1
Wheat	33	0.563	(4.41)	38.6
Groundnut	23	3.414	(2.83)	27.6
Rapeseed	20	3.276	(4.75)	55.7
Cotton	24	2.242	(1.61)	10.6
Sugarcane	24	0.109	(3.39)	51.8
Potato/Onion	8	0.062	(0.21)	46.3

Source: Rajaraman, 2003b.

A further exercise was performed, using these values of β_i to obtain an adjusted parameter for each district, for 11 of the 14 states. These were then applied to district-level crop yields per hectare valued at the state-level farm harvest price to generate the levy per hectare in each district. The district-level adjustment led to no marked change in terms of aggregate revenue, but the range in terms of levy per hectare exhibited the enormous underlying variation in yield, and therefore the need for decentralised setting of levy rates, for equity rather than revenue reasons.

Clearly there will be unevenness of revenue across districts accruing from such a levy, but that is no reason whatever for either not assigning rights of levy to panchayats, nor for abandoning jurisdictional retention. Poorly endowed districts without revenue prospects from such a levy can be granted entitlements to independent and transparent grants. Furthermore, entitlements to shares in

such a grant provision can be easily and objectively determined from acreages sown to crops designated as taxable in a state.

An important caveat that must be sounded again is that the crop-specific levies were worked out subject to data availability in the Cost of Cultivation surveys, and exclude paddy for example in Tamil Nadu, a major crop in that state. On the other hand, the revenue calculations from the crop-specific levy do not deduct for yield failure.

V. ADVANTAGES OF LOCAL TAXATION OF AGRICULTURE

There is nothing intrinsic to the design of the crop-specific levy outlined in section IV that requires levy by local government rather than by State governments, as long as jurisdictional sharing ensures the compliance incentive necessary for it to be revenue-productive. There exists a State-government network for the collection of the land revenue, which most likely continues even in states which have recently repealed the land revenue. But the case for vesting rights of levy, if not immediately or necessarily the collection function, with local government is very strong. Foremost among the advantages of such devolution is the scope it offers for variable rates of levy, in accordance with local willingness to pay.

Resulting from the Constitutional Amendments of 1992 there are 247,033¹⁶ local rural bodies, aggregating across a three-tiered rural governance structure. Of this total, 240,588 are at village level, and 515 at district level, 5930 at an intermediate level between the two.¹⁷ On average across all states, there is one Village Panchayat for every 3000 rural inhabitants.¹⁸

¹⁶ Government of India, 2000 Report of the Eleventh Finance Commission.

¹⁷ The middle rung does not exist in states with a population of under 2 million.

¹⁸ But the range across states is very wide, from 23,809 in Kerala to 1,384 in Punjab.

While granting that for the foreseeable future there will be a need for net transfers from above to the local level,¹⁹ it is clear that without some non-null local fiscal domain, defining and constraining provision of some if not all local public goods, local governments will become mere expenditure agencies funded from above.

Two institutional features of relevance here are that local government is governed by legislation enacted at State-government level, which among other things requires budgetary balance at local level.²⁰ The second is that the fiscal condition of local government is subjected to review every five years by State Finance Commissions, a requirement mandated by the Constitutional Amendments of 1993, so that there is scope for continual redefinition over time of local fiscal rights.

The design of the levy in the previous section is very simple to implement, even with skill levels found at local level,²¹ and the information needed for assessment will be effortlessly and costlessly obtainable locally. The construction of inter-crop relativities are clearly another matter, and can only be performed by government at State level. If local governments lack the administrative wherewithal, the collection function could for an interim period be retained by State governments using the pre-existing network.

Local government has a clear advantage over higher levels even of subnational government, let alone government at the national level, in terms of information and flexibility with respect to local preferences. The very reason for

¹⁹ An excellent blueprint for the design of such transfers is set out in Bird and Smart, 2002.
²⁰ See Ter-Minassian, 1996, for an endorsement of such rule-based approaches to debt control. In recent years, borrowing by municipalities has become permissible, subject to an overall limit.

²¹ A 1994 official survey reports that one-third of a sample of more than 3000 panchayat heads in 448 districts had had only a primary school education or less (Government of India, 1992).

the introduction of a formal third tier of governance in India was the hope that public goods with a local spatial reach, whether of the maintenance variety like sanitation and water supply, or of the developmental variety like conservation of local watersheds, local road connectivity and primary education, would be more effective if provided in accordance with local preferences and conditions.²²

However, the economic case for decentralisation of governance is met only when public goods provided in accordance with local preferences, and are financed from within the beneficiary space (Tiebout 1956). The scheme proposed here is in line with the conventional allocation of taxes on real property to local government (Bird, 1999). Agricultural land is the principal component of private property in rural areas. Taxes on real property pose no informational disadvantages for local governments vis-a-vis higher levels as do income taxes, in the sense of being relatively difficult to conceal, or possibilities of short-run tax base mobility as with (even resident-based) consumption taxes. Indeed, a non-distorting land tax is sufficient for efficiency in allocation of resources towards public goods between regions (Wellisch, 2000).

Real property as a tax base is immobile only in the short run, but the medium term mobility of these are what impose the discipline upon local government of keeping rates of levy commensurate with the level of service provision. The possibility of tax exporting, one of the dangers of fiscal decentralisation (Gordon, 1983; Inman and Rubinfeld, 1996; and McKinnon and Nechyba, 1997), is likewise kept in check by competition between jurisdictions.

Decentralisation of governance in developing countries is opposed by some because of the additional establishment costs involved (Prud'homme,

²² There is evidence for India of the greater effectiveness of local management and delivery (Ostrom and Gardner, 1993; Rao 1995; and Mahal et. al., 2000), but a survey of other country cases concludes that public services for the poor may benefit or lose from decentralisation of delivery, depending on local institutional capacities (von Braun and

1996), and on account of a widely-shared conviction that corruption will be higher at local than at national level (Prud'homme, 1995; Tanzi, 1995 and 2000). On the offsetting efficiency gain, Prud'homme argues that lower production (supply) efficiency at lower levels of government, on account of diseconomies of scale and scope, could offset the better allocative (demand) efficiency achievable through the accommodation to local preferences that decentralisation makes possible (Prud'homme, 1995).²³ This limitation has long been recognised, and is easily met by unbundling provision and production of public goods (Oates, 1972; Alesina and Spolaore, 1997).

On the issue of the relative corruption at national and subnational levels of government, no definitive answers emerge from theoretical investigations of the issue (Bardhan and Mookherjee, 2000). Other influential voices have been quite emphatic about the higher incidence of corruption at local than at national level (Tanzi, 1995). There are many others who may be less convinced, but nurse priors about local government being more susceptible to capture by private interests than government at higher levels.

The real issue is whether or not there is differential local capture between local expenditures funded from above, and local expenditures funded from local revenues. With centralised governance, local expenditures are entirely financed by funds collected and disbursed centrally. With decentralised governance, and more importantly, a decentralised fiscal domain, some local expenditures will be funded from taxes collected locally. Locally-funded expenditure is likely to be less susceptible to capture, because of the enhanced visibility resulting from the reduced distance between taxpayer and government. The greater visibility of the uses to which tax revenues are put substitutes downward accountability to the

²³ Grote, 2002). This merely argues for enhancement of local institutional capacities rather than for not decentralising delivery of local public goods.
For a refutation of Prud'homme's opposition to decentralisation, see McLure, 1995.

voter for the upward accountability ensured by present systems of auditing and control of local government expenditure.²⁴

Any definitive judgement can however only be empirically driven, but data on the basis of which empirical assessments of corruption can be made are scarce everywhere. Using alternative measures from three such independent ratings of perceived corruption,²⁵ Fisman and Gatti, 2002, find that decentralization is associated with lower corruption, based on a cross-sectional regression across 57 countries. This does not by any means close the issue, but is an initial result awaiting further validation. Most of all, local corruption is locally contained, whereas national-level corruption impinges on the whole country. There is also cross-country evidence that fiscal decentralisation is growth-enhancing (cited in Oates, 1999). Decentralisation is one of the strategies in the roadmap for reducing corruption in Thomas et.al., 2000.

However, the efficiency advantages of decentralisation are reaped only when there is greater accountability to the voter at local level (Cremer, et.al., 1995). This in turn requires local electoral processes immune to manipulation (Bardhan, 2002). There is evidence for India of greater voter vigilance in subnational than in national elections (Khemani, 2001); the study however confines the subnational focus to the state, rather than the local, level.

Whether fiscal rights along the lines recommended here will actually be given to local government is a political issue that is not explored here. Federal settings with strong subnational governments above local level have been observed to have weak government at local level (Rao, 2002). In India, scheme-specific Central funding which identifies and establishes Central ownership of,

²⁴ See Rao and Singh, 2000, for an endorsement of the need to do away with the burdensome present requirement of case-by-case approval for local expenditures, and Rajaraman, 2000a for the nature of expenditure constraints presently in place.

²⁵ There are several, of which the most commonly used is that supplied by the International Country Risk Guide.

and hence rights to the political payoff from, developmental expenditure, is around ten times the intergovernmental provision for flows from the Centre to local governments. However, the chronic fiscal stress at all levels of government should lead to favourable consideration of any scheme that will lead to revenue additionality in the fiscal system in aggregate.

The most important imperative in the Indian fiscal system is the need to generate additional fiscal resources, aggregating across all levels of government, for public expenditure on infrastructure, a necessary requirement for accelerating the growth rate of the Indian economy, and the rate of poverty reduction. If such revenue additionality can be achieved by transferring powers of taxation of agriculture to local government in rural areas, clearly the case for doing so is overwhelming. This has the advantage that fiscal resources will be generated at the level where expenditure on infrastructure is most critically needed, and establishes that a revenue-productive local fiscal domain can be defined not just for the urban sector (Bahl and Linn, 1992). The larger issue of how local governments are to be incentivised to exploit the fiscal domain given to them is explored elsewhere (Rajaraman, 2003c).

VI CONCLUSION

Agriculture is a hard-to-tax sector everywhere. In developing countries like India, the task becomes even harder. Books of accounts are not maintained except in the plantation sector. Cash transactions not routed through the banking system pose insurmountable barriers to verification and assessment of self-declared income. Together these add up to an insurmountable information vacuum.

An OLS cross-country regression across developing countries shows that every one percent increase in the share of agriculture in value addition lowers the

tax/GDP ratio by a little over one-third of one percent, after controlling for shares of imports and services. The exercise could be further fine-tuned to distinguish between plantation and non-plantation agriculture, but those data were not readily available.

Thus, the ineffectiveness of agricultural taxation is a major, if not the only, factor responsible for inadequate fiscal resources for public goods in those regions of the world where these are most urgently needed. More effective taxation of agriculture is central to the development issue.

Agricultural taxation in India by subnational State governments, which is where the right to tax agriculture is Constitutionally assigned, serves as a failed experiment on which any feasible design for a future tax on agriculture must necessarily be based. The stylised facts are that out of what until recently were 25 (now 28) states, the number levying a conventional income tax on agriculture has dwindled over time to only those, six in number, which have plantation agriculture. Income taxation of non-plantation agriculture, where at all attempted, was abandoned as infeasible and revenue-unproductive.

State governments have compensated for the narrow base of the agricultural income tax with a high, and steeply progressive, rate structure on plantations, corporate plantations in particular. In the conventional assessment rate structure, the *lowest* slab rates of the state-level tax on corporate income from agriculture in all but one (Karnataka) of the levying states are higher than the flat rate of the Central corporate income tax, presently at 35 per cent (excluding surcharges, which vary by year). These disparities make plantation companies add their voice to transfer of agriculture to the domain of the Central income tax. That will be altogether the wrong direction in which to move. The informational disabilities that have limited the State-level levy to the plantation sector, will be worse at Central level.

Out of the six levying states, only three levy an agricultural income tax independently of the Central (national-level) income tax. The other three states have only tea plantations, which as a manufactured product, is subject to and assessed for the Central income tax, from which a share accrues to the plantation states. The three states doing independent assessment under a conventional income tax have moved over time towards offer of a presumptive norm-based alternative, called compounding/composition schemes, levied per hectare of plantation land. The percentage of assesseees opting for the presumptive alternative ranges between 72-100 percent among those eligible, and between 70-92 percent of all assesseees. Even in respect of regular assesseees, crop-specific norms of net income per hectare are used as benchmarks, at flat rates per hectare irrespective of size of holding, so as to keep the task of assessment within manageable limits. Thus the revealed experience of the states establishes the natural tendency of agricultural taxation to tend towards norm-based taxation over time.

State governments also levy the land revenue, a land-based levy, presumptive in conception, that predates the modern income tax introduced in 1886. The land revenue is far more universal than the agricultural income tax, and is levied in all but six states. Both together yield revenue amounting to a mere 0.4 percent of tax revenue in the country aggregating across all levels of government. The experience of other South Asian nations confirms the Indian experience, of revenue-unproductive agricultural taxation except in Sri Lanka, which has plantation agriculture. Pakistan has not even achieved the definitional separation of livestock and other non-cultivation rural activities from cultivation achieved in India. These fall within the rubric of the Central income tax in India, although in the total absence of data that marks income taxation in India, it is impossible to say how effectively they are taxed.

Notwithstanding the nominal stagnation over time in the land revenue rate structure, it is far more revenue productive than the agricultural income tax.

There is a lesson in this. In developing countries, widely-based levies on land, even at insignificant rates of levy per acre, are far more revenue productive than conventional income taxes, which because of administrative difficulties in assessment, will reduce over time to a narrowly-based levy on large holdings, as has indeed happened in India.

The paper summarises a feasible design for a crop-specific levy supplementary to the land revenue per acre sown to a designated crop. Crop-specificity is required on account of factor-specificity in agriculture, which leads to large differences in returns to cultivation persisting in equilibrium. It also has to be selectively confined to those crops for which returns lie above some specified floor. It is when levies of this kind aim at universal coverage of all crops that they fail the feasibility test. It is not an ad valorem levy on the value of land, and is not therefore a tax on land as wealth. Because the levy is related to potential income, it does not face political opposition of the kind taxation of property unrelated to the income stream generated from the property confronts.

While average returns to crop may differ on account of factor-specificity, it is clearly possible that there could be crop-substitutability at the margin. Thus a levy based on average returns could lead to some distortionary movements at the margin into crops with a lower tax. It is difficult to estimate the possible distortion on this account. Indian agriculture is characterized by so many distortions resulting from the setting of minimum support prices for some crops, that the impact of crop-specific levies might actually be corrective of those other distortions.

In order to specify the levy rate per hectare, a taxable surplus parameter, ψ_{ij} , is required for the i th crop in the j th region. This requires either a field survey, or secondary data on cost of cultivation.

The taxable surplus parameter required to link the levy rate per hectare to income clearly calls for stability in the cost-revenue relationship. This further requires that the parameter must be defined with reference to a yield range over which such stability obtains. If field surveys identify a clear threshold defining the lower limit of the stable cost-revenue domain, this can then serve as the reference yield. A reference yield so defined is independent of crop yield averages, and can serve also as the catastrophe-exemption yield, below which the cultivator will be exempt from having to pay the tax. This is a required feature of the levy, in the absence of perfect risk markets.

In the absence of field surveys, the taxable surplus parameter can only be based on secondary data sources on cost of cultivation, and will have to be anchored to an average crop yield. In that case, the exemption threshold will have to be sourced elsewhere.

There is a crop insurance scheme now on offer in India, protecting against area yield failure, at thresholds stipulated for each of several regions within a state. The levying local government can be granted the freedom to exempt farmers facing idiosyncratic yield failure, using the same announced thresholds as under the crop insurance scheme.

The set of taxable surplus parameters can then be used in unadjusted form to work out levy rates per hectare for any assessment year at yield levels prevalent in the relevant year. That is a perfectly valid option. Alternatively, the parameter itself can be adjusted to yield variations over time. The adjustment parameter β will have to be estimated from a cross-sectional regression exercise across regional crop yield averages. Two types of adjustment can be made to the base parameter. Asymmetric adjustment provides reprieve for yield shortfalls alone, with no enhancement for higher yields, and is done only for yields below the anchor yield. Symmetric adjustment across yield changes around the anchor yield implies adjustment in both directions, with higher yields than the anchor

yield offer a chance for raising larger tax revenue via a higher surplus parameter. Asymmetric adjustment effectively presumes the anchor yield to be a threshold beyond which the surplus parameter stabilizes.

The tax could in principle be levied by State governments through the administration network already in place for the land revenue, with jurisdictional retention ensuring a compliance incentive.

However there are several advantages of vesting rights of levy with local government, chief among which is the efficiency accruing from variable rates of levy on a tax base that is not mobile, in accordance with local willingness to pay.

The enforcement and compliance incentives of vesting rights of levy of a land-based tax on agriculture locally will lead to fiscal additionality in the system as a whole, given the poor revenue yield from agricultural taxation today. The political empowerment of local government through the Seventy-third Constitutional Amendment, ten years ago, has yet to be followed by economic empowerment through a local fiscal domain.

To the extent the tax is grounded squarely and explicitly on current yields, whether from primary field surveys or secondary data sources, there is no danger that it will overestimate present-day ability to pay. Clearly, any reconfiguration of input subsidies presently available to agriculture will alter the taxable surplus parameter and levy rates estimated. There is a potential growth dividend to be had from correcting these prices, because of the negative impact on soil quality of over-use of underpriced irrigation water and electricity. Indeed there is a possible trade-off between the crop-specific tax as initially specified with input subsidies in place, and a lower tax subsequently specified in a package with corrected input prices. This indeed may be the only possible way by which to reduce input subsidies, which tend to be sticky, and far outlive the implicit taxation of agriculture which was the justification for their introduction in the first

place. Eventually, with agricultural income having been raised by the productive use of the initial tax revenues, the tax could be restored, and further enhanced, for subsequent rounds of improvement to agricultural infrastructure.

An accompanying exercise using adjusted parameters at the level of the district, the administrative level just below State-level, yielded revenue estimates not very different from the corresponding exercise using adjusted parameters at state-level, since the state-level yield is the weighted mean of district yields. But the levies per hectare vary widely around the state-level mean, thus highlighting the spatial variation in agro-climatic conditions even within a state, and justifying the need for crop and region specificity in approaches to agricultural taxation. What needs to be emphasized, however, is that the cross-sectional variation across districts in crop yields can be accommodated even through application of the unadjusted taxable surplus parameter to district-specific yields. The adjusted parameter merely finetunes the exercise further.

Finally, two issues with respect to a crop-specific levy of this kind have to do with the progressivity of the levy, and the inherent unevenness of revenue collections across jurisdictions. Progressivity is indeed embodied in the scheme suggested here, since only those crops which yield higher returns (and which are clearly entry-barriered because of factor-specificity such as special soil requirements or other reasons, so that the disparity persists in equilibrium) are subject to the supplementary levy, and since the flat levy per acre varies across crops in accordance with returns to the land. If a food crop is sufficiently profitable so as to be taxable in a particular area, but if smaller subsistence cultivators have a lower marketed surplus, and hence a smaller cash income as a percentage of gross output, an adjustment can quite easily be worked in. Finally, a land tax exempts by definition landless agricultural workers from its ambit. Since agricultural land is the core asset whose distribution underlies inequality in rural India, a tax based on area sown to high-return crops can surely not be labelled as regressive. *In rem* levies, on land regardless of size of holding,

are administratively superior to *in personam* levies, which only encourage fictitious splitting of land holdings.

A simple single-rate structure is recommended here, not graded to yield levels above the anchor yield, so that no information is required on the exact quantum of yield of each taxable cultivator. No information is required either on the complete cropping pattern of every cultivator. The only information required is a listing of cultivators with area sown to each of the crops in the selected subset, and identification of those cultivators in each list whose yields fall below a stipulated exemption yield (failure) threshold. The minimal information requirement for assessment is what makes the levy workable.

Poorly endowed regions without revenue prospects from any such levies can be granted entitlements to independent and transparent grants. Furthermore, entitlements to shares in such a grant provision can be easily and objectively determined from acreages sown to crops designated as taxable in the state.

There is the issue however of whether in countries without formal local government in rural areas, there exists a case for bringing it into being for the express purpose of enabling more effective taxation of agriculture for funding of local public goods. Decentralisation of governance remains the most efficient way by which to resolve the size-of-nation trade-off between economies of scale in production of public goods, and heterogeneity of preferences since the unbundling of production and provision is more easily done within the nation state, than between nation states. Finally, there is recent empirical cross-country evidence that decentralisation is corruption-reducing and growth-enhancing.

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