THE GREEN REVOLUTION AND POVERTY IN NORTHERN TAMIL NADU – A BRIEF OVERVIEW OF VILLAGE LEVEL RESEARCH IN THE LAST HALF CENTURY

Barbara Harriss-White

Work in progress March 2019, revision of the paper first presented at the international workshop on *Relational Agency Pathways Into and Out of Poverty, during Green Revolutions in South India and Kenya,* Madras Institute of Development Studies, Chennai, India, 16-17 February 2017

In this work in progress I summarise and discuss the objectives, framing and results of five rounds of village level studies (VLS), starting in 1972 and ending in 2014. This sets a context for the way in which the understanding of the relation between technological change in agriculture and poverty trajectories have co-evolved.

Problematising socio-technical change and poverty

The green revolution (GR), involving seeds, agrochemicals and water-management[1], is generally thought to have started to be diffused in India in the mid-1960s, having been publicly introduced as relevant to India 5-7 years earlier[2] after nearly half a century of US-dominated scientific work (Cullather 2010). Early planning for India's GR was at the scale of selected districts and their hydrological endowments (Harriss 1972). Despite claims about a 'new green revolution' led by corporate agri-business and developing GM technology (Alagh 2018) or an 'evergreen revolution' through developments in organic farming systems (Visvanathan 2003), it is very unclear when, or even whether, the GR ended. The celebrated grand claims for the GR, its retrospectively labelled 'epic narrative' (Cabral 2019), were actually made at a point in the history of science and of social science that was marked by lack of theoretical consensus. 'Since the crises in grand theory a generation ago[3] (when powerful criticisms were made of neo-classical economics and neo-liberal politics on the one hand, and of

[1] Though in practice also tractors, threshers and pumpsets (Farmer 1977)

[2] Ford Foundation 1959,

[3] Referring to the 1960s and70s

Marxism and socialism on the other) understandings of development have been shattered into subfields, swaddled in discourse analysis and frequently driven by technique' (Harriss-White and Harriss 2007 p1).[4] The village level studies (VLS) of the green revolution in Northern Tamil Nadu (NTN) have been no exception and have been studied – as have all the other long term VLS in India (Breman et al 1997; Himanshu et al 2015) – with an array of practical objectives and resources - and from many different theoretical and normative standpoints. Here I will briefly summarise those through which knowledge of the *GR and poverty* in NTN has been produced.[5] This has involved laying a double analytical grid from the evolving study of poverty and from questions from science and technology studies onto a stratigraphy of evidence collected since 1973. Its core has been focussed throughout on the adoption of new technologies in agriculture and its economic and social impacts but in each round specific research concerns have been added which have changed over time.

[4] 'Development' here refers to its study in several social science disciplines as both an immanent process involving states and markets and an aid-driven project after the Second World War (Cowen and Shenton 1996; Baud et al 2019 .

[5] There is a great deal more to the research in Northern Tamil Nadu (for core texts see Farmer 1977; Hazell and Ramasamy 1991; Harriss-White and Janakarajan 2004; Harriss-White and Harriss 2007; Harriss-White 2015).

Round one: the 1970s

Organisation

The Green Revolution? Project started in 1971 when B.H. Farmer from Cambridge reconnoitred South India and Sri Lanka to identify comparable semi-arid regions where dramatic changes in rice production technology were reported to have been taking place. Farmer put together teams of Sri Lankan and Indian scholars led in Tamil Nadu by Nanjamma Chinnappa, then in the Dept of Economics, Madras University chaired by V Shanmugasundaram. North Arcot District commended itself due to its semi-arid tropical climate, its extent of relatively flat topography with subterranean aquifers, its red (rainfed) and black (irrigated) soils, its rainfed groundnut and irrigated rice economy and its agrarian structure dominated by small *ryotwari* owner-occupiers with little tenancy – and thus its 'relative poverty' (Farmer 1977). A team of field researchers, trained in economics, was supervised by V Rengarajan. At the same time, three British researchers carried out focussed research: John Harriss lived in a village for a year and studied the socio-economics of agricultural transformations (Harriss 1982); Robert Chambers studied development administration and water management; and both studied inter-village variations in development (chapters in (ed) Farmer 1977a). Over a year, Barbara Harriss sampled and surveyed the inputs and product markets of the eastern part of the district (Harriss 1981). All the relevant and available official data, reports and statistics were also collected.

Objectives and Context

The original questions for NTN concerned the diffusion and social impact of HYVs of rice. 'We wanted to understand the ecological, economic and social constraints on the diffusion and adoption of HYVs of rice, and their economic and social implications.' (Harriss-White and Harriss 2007 p 6). In 1972-4, using detailed survey evidence from 11 carefully and randomly selected villages, plus the Slater village of Dusi,[6] together with ethnography, village case studies and extensive surveys of agrarian markets, the first round of fieldwork explored the basis for the contentious expectations, and

[6] Care was taken in a two-phase two-stage sampling design. In the first phase, from the 1971 population census, 11 villages were selected with equal probability from a list of 989 avoiding hilly and reserved-forest partrs of the district, and ordered by contiguous taluks, distance from towns, 1971 population, proportion of agricultural labourers to cultivators, and spatial proximity. The 12th village was, Dusi, a Slater village see Harriss and Jeyaranjan (2015) on Slater villages studied since 1916. Then households in the selected villages were listed, basic data elicited and a 50% equal-probability simple systematic random sample of the households was conducted on the basis of 4 livelihood groups: 57 paddy cultivators, 3 non-paddy cultivators, 77 agricultural rentiers with non-agricultural livelihoods and non-agricultural households including landless labour. In the second year-long phase, detailed schedules about livelihoods were administered once to thrice as appropriate to each of these groups (Chambers et al 1977 pp 37-42).

the emerging evidence, about what seemed to be a 'small farmerist' agricultural policy.[7] On the one hand the new technologies were expected by aid- and US foundation-driven research and agricultural development policy advocates to commercialise agriculture, raise incomes and therefore reduce poverty (Brown 1970; Cullather 2010, Swaminathan 2017).[8] Yet on the other hand early field studies led analysts to argue that, while productivity would be raised, relations of debt, investment, and labour-displacement by mechanisation and by changes in land tenure might do exactly the opposite (Johnston and Cowrie 1968, Mann et al 1969; Cleaver 1972; Sharma 1973). The hypothesis governing the first round of VLS was derived from political economy: namely that size and scale mattered positively to adoption (Farmer, 1977a, pp 4-5). The counter-hypotheses emerging from deductive reasoning in agricultural economics were that size and productivity were inversely related or that the GR technology was neutral to scale (Narain, 1972; Hazell et al 1991, p33). A more nuanced conjecture at the time was that the propagation of the concept of 'scale neutrality' for GR technology might have hidden an agenda for accelerating the capitalist penetration of agrarian society(discussed in Harriss 1982, chapter 5).

The modest philosophy governing round one of the VLS was that inter-disciplinarity was a weapon against 'disciplinary dogmatism'[9], that the 'micro' level of field research provided a corrective to the 'macro' level of generality at which debates about agricultural policy were pitched and that, generally, debates in development needed more rigorously sceptical treatment (Farmer 1977b chapter1; Harriss 1977 chapter 4). Locality and diversity mattered, and could be used to criticise and refine theory. So our collective field research embodied the trans-disciplinary[10] eclecticism of the

[7] Questions concerned the extent the new technology was targeted at – or adopted by - small farmers or big farmers ; or either for farmers or to incentivise the agro-industrial complex servicing production – and whether the outcome was 'good' or bad, for which agrarian strata. And why.

[8] In development economics, income is the variable governing poverty. Less well behaved statistically than its proxy, expenditure, if only because the former is more volatile, income is widely understood, it is possible to compare income over time (with adjustments for inflation and PPP) and it is a continuous variable easy to integrate into the regression model approach to understanding economic phenomena.

[9] Notably that between on the one hand 'land grant' agricultural economics espoused by aid agencies focussing on markets, price responses and entrepreneurship with – it follows - a limiting role for the state (see the reviews in Harriss 1979; Harriss (J) 1991a; Lele 1971) which played into the interests of agrarian capital and, on the other, first, anthropological studies of deprivation in agrarian society (Gough 1977 and reflections in Harriss(J) 1991b) which market exchange relations did not reduce poverty but which tended to escape notice by policy makers and, second, technical, science-based field reports and statistical analyses which informed research in agricultural universities and the Indian Agricultural Research Institute and its satellites (Sen 1967; and see reviews in Cullather's history 2010).

[10] Terms about research involving more than one discipline are confused and fuzzy. From Choi and Pak's (2006) systematic review, trans-disciplinarity is found to span science and social science, multi-disiciplinarity (commonest) adds insights from more than one discipline and inter-disciplinarity (rare) aims at a holistic fusion from more than one discipline. In the 21st century in both science and social science, subfields have

1970s, incorporating agricultural economics, hydrology, agrarian sociology and geography. It invoked theories of innovation, of agrarian change, of market behaviour and commodification, and of development administration and management (the latter providing the initial evidence and motivation for Robert Chambers' lifetime revolt against the kinds of projects and ways of knowing epitomised in round one).[11]

Findings relevant to poverty

At the outset the GR research was troubled by 'alternative facts' shrouded in 'unreliability and confusion' (Farmer 1977a, p414). First, the diffusion of the new technology reached only one third of the land area claimed in the officially published statistics for the region (Harriss, 1977 ch 4), 13% of paddy area in fact, and second, the small producers it was supposed to be intended for were not adopting it. 'The much discussed scale-neutrality of the new technology is…belied by the greater access which the larger cultivators have to the crucial factors of production involved – cash, pump-sets and fertilisers' (Chinnappa, 1977, pp 122-3). Chinnappa had found that both the cultivators who adopted HYVs and the labourers working for them benefited from the introduction of the new technology, but the former about twice as much as the latter. This inequality in adoption, benefits and income was consistent with the results of field research based on ethnographic methods (Harriss 1982).

Technological innovation and productivity rather than poverty was the central concern of the first round of VLS (Farmer, 1977b). Couched in terms of income (though not yet a poverty line), poverty was associated with *non-adoption* and with *landlessness*. The dynamiser of economic mobility was the new *agricultural technology* plus an assured supply of water (Chinnappa 1977). 'Agency' was not conceived as an individual capability. Instead, as in much social science then and now, agency was analysed in terms of social and political relations scaled up to the level of social groups and structures about which theories were created. In round one agency was seen as the capacity to adopt innovations and was analysed not using case studies but in terms of groups of adopters versus non-adopters; small and large farmers (op cit p93), scheduled caste households versus the rest;(op cit p116) four income categories, and between 6 and 13 operational land-holding size

proliferated within and across disciplines, with outcomes which may impede communication. Of course, within and across disciplines incompatible differences in theories and paradigms also co-exist.

[11] These included the slow pace and wasted data and evidence arising from what Chambers saw as a cumbersome survey research process, the long period needed to analyse and write up field evidence - work often distracted by teaching and changes of jobs, the disconnect between outsiders' and insiders' concepts, experiences and priorities, and the misrepresentations, biases and omissions that result from surveys, their analysis and their dissemination in forms (and places) inaccessible to those most in need of knowledge. See Chambers 1992; Cornwall and Scoones 2011.

groups (op cit. p119, p129). A classification in terms of 'leaders' and 'laggards' was also used (Harriss 1972). And a body of literature from early business studies on leadership and entrepreneurship celebrated the fertiliser dealer and the grain trader as 'change agents' (Broehl 1973, Harriss 1981). 'Agency' in technology adoption was implicitly male, because round one was pretty gender-blind; only passing mention was made of attached male labour being on the decline, and casual female labour on the increase (Chinnappa 1977).

Harriss' authoritative ethnography of Nesal village[12] in 1973 (Harriss 1982) does not mention poverty in its index but is suffused with insights about poverty relations and with examples of individual agency. In a scholarly context stressing contemporary transformations in social structure, Harriss found land and water relations still substantially structured through the village's social hierarchy of caste (pp126-30). Rates of profit in agriculture were differentiated by caste-stratified land holding. While returns to elite, HYV-cultivating wage-labour exploiting farmers matched those from money-lending or local urban industry, the cash accounts of the hardly-landed revealed poverty and precarity converging with that of the incomes of landless labour (pp183-5). Pauperising relations and events also had greatest impact on the low caste, hardly-landed class. These included the costs and consequences of accidents and sickness and the social compulsions of conspicuous expenditure not only in death rituals but also for marriages (chapter 5). Uniquely among the rounds of VLS, Harriss analysed the varied roles of kinship and of caste ideology in legitimating the social order of poverty. Households were not isolated entities, he argued, but niched in kinship relations. Cross-cousin marriages locked assets within a close circle of kin and acted as a counterweight to land partition at inheritance. Among the locally dominant caste, kinship norms were slowly being subordinated to the search for economic and political power; marriage distances were increasing spatially and socially. Among the lowest castes, cross cousin marriages were more prevalent and localised; they helped in the mobilisation of labour for agricultural operations (pp138-46). Social. relations in Nesal village were still ordered substantially through status rules about the social handling of defiling liquid and solid substances, rules which were then not always obeyed. Inside and outside the village panchayat, the dominant caste was the legitimate authority to resolve disputes and allocate village resources. In accepting this legitimation, low /scheduled castes participated in their own oppression (chapter 6). They internalised dissonant explanations for their pauperised condition: on one hand in terms of origin myths, reincarnation and behaviour in past lives and

[12] Also known as 'Randam'.

on the other in terms of material conditions, protests about which, despite Dravidian politics, they expressed in verbal grumbles and not through political mobilisation (ibid). In the 1970s, the monetisation / commodification of caste based services and artisanal activity – the age-old non-farm village economy – was starting to disturb the rights of such workers to subsistence and the protections of patronage (pp236-8) making their exiguous livelihoods more insecure.

At the same time as this granular account was researched, a novel 'in depth' analysis of the entire set of sample villages, treating them as social and economic entities while accepting that their self-sufficiency was a myth,[13] generated a *different scale* for the explanation of poverty and agricultural productivity. Remoteness from towns, population pressure against land resources, the seasonality or 'industrial' continuity of agricultural work and social relations (of patronage, bondage and of caste) shaped the extent of innovation adoption in agriculture and thus to the degree of seasonal 'saturation' (of the demand for labour), such that in some villages pauperised 'surplus' labour had to migrate-out (Chambers and Harriss 1977 p321). Villages were classified into groups on the basis of these agricultural parameters; and two of the 11 or 'substantial rural pockets' … 'exist(ed) at a low level of livelihood and constantly export(ed) people to the remainder of the economy' (ibid)[14].

Round Two: The early1980s

Organisation

For round two, the baton passed to the International Food Policy Research Institute in Washington from where a team of agricultural, food and nutritional economists led by Peter Hazell collaborated with a team of agricultural economists from Tamil Nadu Agricultural University, Coimbatore led by C. Ramasamy. John and Barbara Harriss contributed focussed 'repeat research' and Sudhir Wanmali examined the spatiality of infrastructure.[15]

[13] For the critical exposure of this myth see Srinivas and Shah 1960

[14] The dynamics of rural-rural migration were noted as a research need outside the scope of the first round of VLS (Farmer 1977 p 398). Surplus labour commuted from villages to work in market towns; the non-farm weaving industry also absorbed labour (Harriss and Harriss 1984).

[15] Wanmali's question (1991) concerned the spatial and social patterning of the relation between on the one hand the provision of services (infrastructure, agricultural extension and inputs and agricultural product markets, markets for consumer goods and credit) and – on the other - agricultural production. Using census data, Wanmali classifies these according to household access into spatial hierarchies of service centres. Pages 215-18 and 228-30 also provide granular household-level detail about 134 'services' in the non-farm economy. Services decentralised spatially between 1973 and 1983, increasing access, especially for low order services but (while Harriss' case study of Arni found increased long-distance wholesale linkages outside the district (1991a), Wanmali found the region was found 'self-contained' for most items of rural consumption and

Objectives and Context

In stark contrast to round one, round two, lasting in the field from 1982-4, was theoretically driven by a response from US development economics to the now little remembered but then threatening Maoist focus on agriculture as the first priority for development.[16] John Mellor's *New Economics of Growth*, 1976, had privileged the agricultural sector in development planning - and a small-farmer focus for agricultural research and policy. Not only did this theory invoke the inverse size-productivity relation, with its positive implications for land reform, but it also argued that the consumption linkages (especially the increased expenditures made by 'small farmers' who benefited from the GR (although *not* in 1970s NTN (Harriss 1987a))) would generate demand for decentralised, small-scale, labour-intensive forms of industrialisation. Not only would this reduce rural poverty by tightening rural labour markets but it would also address the problem of rural-urban migration and slum development by offering potential migrants alternatives, so blocking migration.

By then the GR's multiplier effects had already emerged in India. On the one hand income inequality and persistent poverty (researched through development economics), the differentiation of rural producers into the polar classes of capitalism, and struggles of landless labour (the central concern of agrarian political economy at the time).[17] On the other hand, problems of the disposal of state-procured grain surpluses were emerging and led to *'Garibi Hatao'* and a slew of *distributive policies* targeting the poor, in a variety of measures against the kind of rural income inequality that had been exposed in round one (Harriss et al 1992). Meanwhile new questions about appropriate post-harvest technologiesjoined old questions about the welfare objectives of the organisation of post-harvest distribution.[18] The latter were 'forward production linkages' in Mellor's terminology but when the concept of the agrarian was expanded to encompass *post-harvest*

effective demand and interpreted them as non-farm growth linkages. Over and above agriculture, he also noted a significant role for state services which he conjectured may substitute inefficiently for an as yet under developed private sector.

[16] Despite the end of China's cultural revolution, Maoist revolutionary activity was spreading in S and SE Asia (Mohanty 2006).

[17] See Government of India 1993 for poverty figures, Tendulkar 1992 for inequality; and extensive discussion in Thorner 1982 for class differentiation.

[18] In the early 1970s, Modern Rice Mills from Japan and Germany had started to diffuse in India. Even with heavy subsidies they were no match in terms of engineering outturn, cost and employment against the Lewis Grant Huller mill adapted from a coffee grinder in the early 20th century. The original case for them was found flawed (Harriss 1976, Pacey and Payne 1984). Eventually when large streams of paddy could be purchased and supplied and technology adopted for monsoon-proofed husk-fired drying, the 'Automatic Rice Mill (one of which could in time mill as much as milled in an entire market town did in the 1980s) became viable. Over the decades from the 1980s large scale labour displacement occurred as a result (Mani et al 2019).

marketing systems, the scope of the poverty question was also expanded to encompass technological change and employment in product markets.[19]

The core aim of round two VLS was to use the villages to gather evidence with which to construct an ambitious general equilibrium model of social accounts which could be activated to 'post-dict' Mellorian growth linkages (in production and consumption) of the GR in rice. Evidence was extrapolated to the level of the district: the *district* was the unit of analysis. Nevertheless secondary spin-off VLS achieved fine-grained resolutions. Detailed village surveys[20] and case studies, repeat ethnographic visits to villages, survey research in a market town and data collection from every government department and all the banks generated a critical engagement with theory, methods and substance in this branch of development economics and could be used to check the regional models' results. The environmental research of round one[21] was not developed. A very severe drought in 1982/3 had to be compensated for by an additional partial survey in 1983/4 when the region had somewhat recovered. Otherwise the GR would have been associated with negative agricultural growth. Post drought, 90% of the paddy area was found to be down to HYVs.

The social accounts simulation and extended input-output modelling generated the overall result that while agriculture continued to supply the region's economic base[22], the GR in NTN was not dramatic and did not worsen rural income inequality (Hazell and Ramasamy 1991 pp55-56, pp238-47). Every Rupee added by agriculture generated about an equal amount in the non-farm economy- though final conclusions qualified it downwards to Rs 0.6-0.7 (op cit p245). Consumption linkages were weaker than found in comparable rice areas in Malaysia and the benefits of growth linkages accrued mainly to non-agricultural households. In the decade from 1973, small farmers obtained a third of their income increases from non-agricultural activity, while landless agricultural labour households obtained a fifth, a result interpreted as showing that growth linkages alleviated agrarian poverty (Hazell et al 1991c pp 174-80).

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[19] Harriss and Kelly 1982

[20] In the same set of 11 villages as round one, 345 households were sampled: stratified using round one definitions, into 160 paddy cultivators, 25 non-paddy cultivators and 160 non-cultivating households, 120 of which were landless labour (Ramasamy et al 1991 p25-6). The five most drought-affected villages were resurveyed in the 1983/4 recovery year.

[21] Madduma Bandara (1977), a hydrologist, had measured well depths in and around all the sample villages in 1973 and predicted the rate of water table decline and the hydrological crisis that eventually added dysfunctionally to the costs of production.

[22] In 1982-3, 44% of the district's income, 68% of its 'exports' and 72% of all commodity transactions came from agriculture. Inward remittances were – at 4% average household income - unimportant. The government generated 70% of its own revenue from within the district but one fifth of savings fled the district (Hazell et al 1991b chapter 7).

Results relevant to poverty

In round two, poverty was again described using continuous variables not in relation to a poverty line (which by 1991 had become standard practice in poverty studies) but principally in terms of absolute and relative poverty of household incomes and their trends. But in addition, the itemised consumption components of households' incomes were converted to nutritional values. Agricultural production and its linkages were the analytical master keys to poverty. Over the 'post drought' decade from 1973 to 1983/4 paddy production had increased by 82% on small farmers (under a hectare) through yield increases and by 143% on those over a hectare – through area expansion and multiple cropping (Hazell et al 1991a). While the IFPRI team found an inverse size–productivity relationship, and found that the yield gap between large and small producers had closed and concluded the HYV technology was scale-neutral.[23] They found other trends that pointed towards the gains of small farmers' converging on those of larger farmers. Since 1973, small farmers had increased incomes by 90% and landless labour by 125%, whereas non-paddy farmers' incomes had risen by 18% and non-agricultural households' by 55%. The last two categories were losing out relatively and were labelled the '*new rural poor*' (Hazell and Ramasamy 1991, p 55, pp 241-5; pp 262-3) Nevertheless the GR had enabled landless households to gain parity with small farmers through earnings from wage-work.[24] Despite the entrance of women into the labour market on low wages, and however much the wage gap between labouring men and women had widened (Harriss 1991a, p61), this was taken as proof of the tightening of labour markets predicted by Mellor. The new poor notwithstanding, Hazell and Ramasamy also found that direct and indirect (consumption-linked) benefits were widespread in the *non farm economy*. Harriss lists paddy trading, petty business, weaving, livestock herding, services for men and low-level government jobs, clothes washing and tailoring and domestic service for women (1991a pp62-5).[25] But the extent of the non-farm economy appears to vary directly with proximity to towns and small service centres (Harriss 1991b, p115, Wanmali 1991). Outmigration had picked up somewhat –to local towns, and South Indian metros for

[23] Hazell and Ramasamy 1991 chapter 11. Of course scale-neutrality does not mean resource-neutrality. With respect to resources, landlessness was classified as having less than a quarter *acre*. 'Small' was defined as operating under 1 *hectare* (sic) while 'large' was the rest (Hazell and Ramasamy 1991 p31) ignoring the impact of both proximity to roads and soil-water status on land resource values and operational scale. The Hazell-Ramasamy volume also used the categories of small paddy farming households (hh); large paddy farming hh; non-paddy farmers; landless households and non-agricultural households (op cit p42). Gainers and losers of land; capitalist, rich peasant , middle peasant poor peasant were also used as analytical categories (op cit p72). And small peasants (op cit p 82).

[24] Harriss (1991a p117) from his village ethnography finds much inter-village variation however and mixed evidence for rises in real wages

[25] And see Wanmali's 1991 list of 134 non-farm services in the district.

casual labour and textile work, tightening local labour markets and easing incomes through remittances (Harriss 1991a p65-7) including those from military service. Despite relative poverty in rural non-agricultural households, Hazell and Ramasamy concluded from trends (and from inequalities) in real consumption expenditure and diets [26] that trajectories of upward mobility out of poverty were evolving not just in agriculture but also outside it and as an indirect result of GR (1991, p243).

Round two contained limited information about the roles of social institutions in relations of poverty. Harriss' repeat field study of inter-village variations found a general relationship between the proportion of scheduled caste households and the incidence of hired labour. But the proportion of SC households varied from 18 to 67%. Meanwhile earnings from wages were also determined by factors other than caste - seasonal demand for labour being shaped by irrigation, further tightened by the non-farm economy (Harriss 1991a). The latter was a barrier to female participation. Nonetheless a trend of increased, albeit segmented, economic participation by women was observable. While in local towns, women's wages in rice mills and twisting workshops were 20-30% lower than those of men, in villages on average the gap was 40% (HarrissB 1991, p200). The village ethnographies posed challenges to theories of class differentiation consequent to the GR. For while there was no clear trend in the agricultural labour force, there was also little evidence either for dispossession or for further concentration of the landholdings of the dominant agrarian caste. Instead, case material suggested processes of partitioning, miniaturisation and stabilisation of land-holdings (Harriss 1991a, Hazell and Ramasamy 1991 p241-2).

The concept of poverty had meanwhile been enriched with scholarship in basic needs. Round two examined a basic need about the vital importance of which there is consensus: nutrition.

Nutritional poverty

Post-dating conceptions of development as 'basic needs' (Jolly 1976), but pre-dating the emergence of 'human development' (Griffin 2000), round two, initiated by the IFPRI, would have been rather amiss had it not examined food consumption and nutrition as an expression of poverty. This was analysed not anthropometrically but through expenditure on food converted into the cost of calories for a subset of 5 villages in 1973 that were resurveyed post-drought in 1983/4. Trends in nutrition poverty were extrapolated. The threshold of nutritional poverty was an income consistent

[26] Expenditure is considered a more reliable and smoother poverty indicator than is income.

with food expenditure at 80% of 'recommended levels'.[27] While in round one, 70% of households consumed less than 'requirements'[28], in round two only an average of 20% did – but 30% among landless labour households. In 1983/4, in all round two households, food amounted to 70-80% of total expenditure. Yet all households were found to be diversifying their diet into calories generally considered to be income-elastic coming from oil, milk, vegetables, lentils, fruit and bananas. The project noted the rising cost of calories for landless labour households which consumed 20% (450 calories per caput) less than small farmer households. 'Only' 10-15% households were severely calorie deficient (at less than 80 requirements). The strong implication was that rising incomes were driving down nutritional poverty, consistent with growth linkages theory (Pinstrup-Andersen et al 1991, pp85-97).

At the same time (1984) a field case-study of the Noon Meals Scheme (the world's largest school nutrition programme), in Dusi, the suburbanising 'Slater village' which had been added to round one, and in Veerasambanur, a small backward sample village,[29] produced a different account of food insecurity and scarcity (HarrissB 1991b). Nutrition poverty was found more prevalent. Against a low-end requirement of 1.2 Basal Metabolic Rate (BMR:1,700 calories, 30% less than IFPRI's RDA), 55 % of poor households with children under 10, a group with under 1 hectare of land plus landless labouring households, suffered calorie deficits of between 14 and 23% below the BMR requirement. They also lacked the dietary diversity picked up by round two. Alcohol consumption also contributed to nutrition poverty. For, while in the IFPRI resurvey it was recognised that a few cases of alcohol consumption caused some debt and downward mobility (Harriss 1991a, p67), in the two-village case study, one third of households had a member consuming alcohol, consumption behaviour not confined to Scheduled Castes (as it was widely thought then). Ten per cent of the households had both inadequate food supplies and the presence of an *arrack* drinker. When the estimated cost of alcohol consumption by male adults was translated into potential spending on the cheapest cereals, these households' food scarcity would have disappeared. In the same region, different sub-samples of villages, classifications of households and modes of measuring undernutrition and diet produced different substantive outcomes.

[27] These were not specified and were then the object of considerable debate (Pacey and Payne 1984; HarrissB 1991b p44).

[28] The calorie 'requirement' is found in a footnote to Table 5.9, p94, in the form of the Recommended Daily Allowance (RDA) of 2400 per adult equivalent (a 55kg man). Large farmer households (above 1 hectare consumed 1724 cals per person (not per adult equivalent) in 1973/4 and 2884 ten years later. Small farmers consumed 1386 and 2606. Landless labour households consumed 1426 and 2154 (Pinstrup-Andersen et al 1991 Table 5.3 p91).

[29] Called respectively Lakshmipuram and Eraiyur in Harriss 1991b).

Diversification and growth linkages

An additional aspect of round two has a bearing on conceptions of poverty. This is the declining role of agriculture and the diversification of this region's rural economy. How did it conform to the theory of agricultural growth linkages - labour intensive, poverty-reducing activity responding to production and consumption linkages? Focussed case studies running simultaneously alongside the village-level sample surveys generated nuanced arguments about the multipliers of agrarian change. The concept of diversity thereforedeepened from the round one concept of inter-village variation to grapple with diverse non-farm livelihoods. For a start, despite the IFPRI habit of 'pooling villages' (Hazell and Ramasamy 1991 p5) for model parameters and estimates, inter—village variation (IVV) in levels of development measured by irrigated land, agricultural mechanisation, demand for labour and wages, access to urban centres and livelihood diversification had increased. However land control shaped poverty and entire *villages which also had the most unequal land distributions and the largest proportions of assetless households* were now classified as poor (Harriss 1991b).

In TNAU's outdoor labs for rice research during the 1980s, the GR's key technological component and production linkage – seeds - had traded robustness to environmental stresses (like water, soil, temperature and photoperiodicity) for adaptation to the local agro-ecology and climate.[30] Taking the set of villages as a whole, as this round tended to do, quick-maturing, photo-period insensitive, better-tasting HYVs were now available (Hazell et al 1991a, p 42), and GR technology had been generally adopted across the agricultural economy. However the case material suggested strongly that the economic diversification that had occurred 'could only partially be explained by agricultural growth'. The need to justify the GR had combined with the disciplines of SAM modelling to lead the test of Mellor's theory of growth linkages from agriculture to neglect non-GR drivers of growth and other anti-poverty processes (Harriss 1987b.

While the centrality of agriculture in the cause-effect relations of growth was undeniable, the importance of other causes of livelihood diversification were revealed - through field-work rather than theory. First, through the behaviour of markets for labour: since no increase in overall agricultural employment was recorded and average on-farm demand for wage-work

[30] In the seed-breeding vocabulary whereas first generation HYVs maximised environment-genotype interaction, the second generation minimised that.

declined by 25%.[31] If real agricultural wages were rising, they were caused by pressure of labour demand in other segments of labour markets. Caste and gender structured these markets in ways that were both crude and contradictory. On the one hand Dalits and women were trapped in the villages, confined to casual agricultural work and not allowed into the non farm economy. On the other hand, men and non-Dalits were able to leave, therefore reducing local labour supply. Second, *forward agricultural production linkages* were found to be labour intensive and local but often producing for national rather than local demand; conversely industry with local production linkages was neither labour intensive nor small scale (Harrisis 1987b). A third non-agricultural force diversifying livelihoods was public expenditure, in *subsidised state employment programmes,* notably the Noon Meals and National Rural Employment Schemes/Food for Work. Research on the region's money markets also identified the hand of the state in *low interest* (subsidised) *credit,* which added another organisational layer to the complex informal money markets in which poor rural people rolled – and still roll - credit and debt.[32] Village ethnography showed competition in moneylending in local money markets (between traders, pawnbrokers, 'private parties' and chit funds, etc) and between market and state organisations (co-ops and nationalised banks)). This generated further 'anti-poverty effects' by reducing the interest rates on) transactions for borrowers with proven assets[33], which in turn increased the nominal incomes of borrowers (Harriss 1991a pp75-80). These 'growth linkages' – to the state and local agri-business - were stronger than Mellor's theory predicted. Persistent rural inequality, however, accounted for the existence of mechanisms such as *savings / bank deposits which were drained* from the district to the metropolis and inhibited investment in local production (Harriss 1987b). These findings called for regionally specific and more nuanced models of growth linkages - although such models did not directly or indirectly address poverty.

Policy for reducing poverty was inferred from the empirical findings and addressed to the government, as an 'economic actor', whose influence was theorised to be mediated through its direct impact on agriculture and its indirect impact through growth linkages.[34] Policy recognised to pre-empt

[31] See Hazell and Ramasamy 1991 p240.For the outcome of voluminous literature on the labour displacing effects of mechanisation and tractorisation versus the labour creating effects of (private well) irrigation and the threat the latter posed to employment in public (tank) irrigation see Binswanger (1986).

[32] See Guerin 2014

[33] For landless and poorly asseted borrowers, interest rates had become more oppressive: on jewels upwards over the decade from 1973 from between 14-18% to 24-36%, and on watches and brass vessels from 60 to 120% (Harriss 1987b p 36).

[34] Senior IAS officers and international agricultural policy experts participated in a conference on the round two IFPRI results held in Ootacamund in 1986.

poverty in the early stage of release of HYV technology included that for water, credit and fertiliser, together with infrastructure: electrification, transport and telecoms, subsidised food and nutrition programmes, regulated markets and food for work employment schemes (Hazell and Ramasamy 1991, p244-7).

Round two, remarkable in terms of models from development economics, was remarkable for the scant attention paid to the way ideology enables people to participate without objection in processes leading to poverty and to changes over time in the structure and processes of ideas and values (HarrissJ 1982 chapter 6). In fact subsequent rounds have tended to treat institutions such as caste and gender – even households - 'mechanically' and categorically, as is conventional practice in development economics, and have reinforced this neglect, as conventional in political economy.

Round Three: The 1990s

Organisation

Round three saw yet another switch of research institutions with a thin line of continuity. It involved an international collaboration between a field-work, data processing and analytical team from MIDS directed by S. Janakarajan and a smaller team directed from Oxford University by Barbara Harriss-White. With a remit grounded in political economy and development economics, at its maximum a group of 40 worked on round three in Oxford, Chennai and the field, creating the village censuses and sample survey supplemented by individual research in and around three villages and in one market town.[35]

Objectives and Context

This round was set against an intellectual and historical backcloth that had changed in three major ways. First there was a theoretical movement towards the 'dematerialisation' of development. By 1990 Mahbub ul Huq had published the first human development report in which the object of development was no longer growth per se, or industrial transformation per se, but human wellbeing and the social conditions under which generalised wellbeing was to be achieved (prime among which was, for Sen, 1999, freedom).

Second, in agriculture, despite the positive conclusions of the IFPRI project, the view persisted among agrarian scholars that the green revolution had not succeeded in 'transforming the conditions of insecurity and poverty that characterise the Indian rural economy' and that small and marginal producers 'remained highly dependent upon advances of credit, and so downturns in yields and/or prices (had) ratchet effects, pauperising them and locking them still further into debt' (reviewed in Harriss-White and Harriss 2007, p13). Similar ratcheting credit relations were emerging in the rural non-farm economy. The rice economy of Tamil Nadu was now on course for growth rates half those of the first decades - and relative stagnation (Harriss-White et al 2004 p3; World Bank 2004). The rate of well digging and electrification slowed[36] and processes of energising wells were balanced by ones abandoning them. Having acted as an exceptional labour sponge compared with other economic sectors, Indian agriculture started to shed labour (Sen, 2002). Was the GR finished? Certainly not in Tamil Nadu.

[35] In 1993-4, the third census was taken of all the 11 villages originally selected in 1973, to generate a long-term core of questions about household composition, kinds of poverty, assets, labour and livelihoods (including agriculture) (see details in Srinivasan 2004).

[36] By 1991 there were about 300,000 energised wells – up from 230,000 in the early 70s. (Harriss-White and Janakarajan 1997)

Between the early 1980s and 90s, fertiliser use had increased by 30% (Harriss-White and Janakarajan 1997, p1470). Was agriculture no longer revolutionary? Research remained revolutionary: in the late 1980s and early 90s agricultural research had turned to develop HYVs for the 'minor' seasons; half of the new varieties were now bred entirely in India with no foreign seed imports; the rate of obsolescence of new varieties accelerated, and a new approach to technologies for integrated nutrient management, integrated pest management, and efficiency improvements in the utilization of water and soil resources was being developed (Harriss-White and Janakarajan 1997). In an economic revolution however, costs per unit of output would decline. On this count, despite the 100% subsidy on agricultural electricity, by 1993-4, real costs of HYV paddy production had risen by 63% over costs in 1973. And the green revolution was not revolutionary (Harriss-White et al 2004a, pp24-31 Tables 16-19). Further, given the findings about diversification in round two, in round three, agriculture was no longer assumed to be the dominant driver of growth and households' mobility in the village economy, and the scope of the design of questions about agriculture and the rural non-farm economy was widened.

Third, in 1991, the government of India started to implement structural adjustment policies that had been forced on Africa ten years previously without conspicuous success, but which in India were the precursors of an era of liberalisation. First to be transformed were trade and exchange rate policies and corporate and financial sector regulations. Meanwhile there was considerable *policy continuity* in sectors of the Indian economy dealing with essential commodities and utilities – notable among which were food, electricity and agriculture (Harriss-White 2004a). And although states resisted electorally sensitive reforms in sectors such as power supplies over which they had constitutional responsibility, and although the informal economy or unorganised sector in which agriculture is officially classified continued to be neglected nationally (while informal labour, finance, and commodity transactions ballooned) (Sinha et al 2007), nothing stopped the stagnation of public expenditure and the de-prioritisation of agriculture in public investment (reviewed in Kakarlapudi 2010). Experiments in agricultural liberalisation, such as reduced subsidies on fertiliser and agricultural electricity, and calls for the privatisation of agricultural electricity had to be rapidly withdrawn but the Indian state failed to protect agriculture against price and output volatility and intercrop instability, while the 1990s All-India growth rate of yields continued to slow down (ibid p13) To the extent that agriculture was included in liberalisation at all[37], it was the post-harvest system of distribution that was first liberalised: storage and

[37] Except negatively through public expenditure stagnation.

movement restrictions were lifted early on (Harriss-White and Janakarajan 1997).

So, while the third round continued to collect a common central core of agricultural data over a period starting to qualify as the 'long term', the VLS team expanded its conceptual frame to cope with the diversified economy : diversified in agricultural production, in the non-farm economy and in household livelihood portfolios. It moved towards a focus on the infrastructureenabling diversification in rural development, and the institutions and organisations through which market exchange and commodification had intensified and through which changes in the 'politics of policy' were to unfold[38]. For the first time the team also engaged with theories of human development and their implications for poverty, now conceived in multidimensional terms. It confronted the practical need to be selective in what aspects to study and how. While All-India urban- and corporate-biased policies of structural adjustment led to reduced rural infrastructural subsidies and social expenditure (data in Ghosh 1997), in Tamil Nadu a skeletal social safety net was in the making (Guhan 1992). Round three chose to examine relatively neglected infrastructure which supplies *public services affecting private poverty* at the household level: sanitation, drinking water and waste disposal. It selected aspects of individual human development variously theorised as 'basic needs' or 'elementary capabilities': gendered life chances, health and incapacity for work, under-nutrition, education and the shocks to wellbeing that justified state provision of social security (for motherhood, unemployment, sickness, breadwinner death and income poverty in old age).[39] This round was framed more explicitly in the constitutive context of political economy and its institutions than had been done hitherto.

In 1989 the earlier unit of policy analysis from which the villages were selected, the district, was split. So most villages that had been randomly selected for study now found themselves equally randomly sited in a relatively underdeveloped district. Not only could entire villages be classified as poor, the new Tiruvannamalai distribecame

[38] Shaffer (1984) identified policy through its practices, consisting in three simultaneous fields of bureaucratic power: i) agenda (in which discourse is sited alongside pressures from non-bureaucratic institutions such as the media); ii) law and procedure and iii) access. To this Harriss-White (2002) added iv) resources.

[39] Information about the detailed, three-village census of 745 households is given in footnote 35; see also Colatei and Harriss-White 2004 p119 for their scope. Official census data for the three villages were also used and helped simplify the classification of non-farm activities (given that Wanmali (1991) had identified 134). Village level wages data were collected. Detailed questionnaires covering production, exchange relations income and consumption, and access to utilities were canvassed at regular intervals over a 12 month period in 1993-4 with 115 households drawn from each village proportional to its number of households (48% in Nesal; 30% in Vinayagapuram and 22% from Veerasambanur) and randomly selected proportionally to households in the cluster-analysed class stratifications (Harriss White and Janakarajan 2004 p36-7).

'poor' – officially classified in the bottom 5 of Tamil Nadu's 35 districts for human development (Tamil Nadu State Planning Commission 2007).

Developing the insights of Schaffer (1984), policy was not seen as a residual 'implication', as it is in conventional development economics, nor was policy failure reduced to corruption, as in rational choice political science. Instead policy was understood as reflecting its necessarily complex bureaucratic politics: its discourse and agenda, its law and proceduralisation, its politics of resource mobilisation and of allocation and access. The approach zoomed in from the national, through the state-level of policy to local policy practices and outcomes. The analytical approach of round three was critical and incrementally prescriptive, not resulting in policy implications so much as examining room for policy manoeuvres within the existing political economic structure and aware of 'policy preconditions'[40] and institutions needing to be in place for policy prescriptions to be effective as intended.

Results relevant to poverty

Concerned as it was with rural development, round three was the one which has had most to report about poverty, and which, if only because of the contrast with 2017-18, is likely to be most relevant to SPRU's round six.

Inter-village poverty

First, the analysis of *inter-village variation* took a further original twist relevant to an understanding of poverty (Srinivasan 2004). From the 11 village census of 1993-4, village-level variables indicating household demography, human development (e.g. gendered literacy, child sex ratios), the incidence of landless households and wage and family labour utilisation, the proportion of small farmers, irrigation intensity and cropping pattern, household and per caput incomes from agriculture and the non-farm economy, debts and liabilities were used to compare villages both between themselves and over the twenty year period. Then thirty seven variables pertaining to these dimensions of village economy and society were analysed using principal components analysis and a varimax rotated factor matrix, through which four factors were generated. These factors systematically shaped variations in the village economies stylised through this set of

[40] Policy prescriptions in development economics are conventionally presented as 'implications' which embody strong and unexamined assumptions about state capacity and resourcing. Policies have effects – intended and unintended- and activate antagonistic interests. Policy advocacy ought to – but generally does not – assess institutions and interests hostile to it, how they may be avoided, bought off or destroyed. Nor does it internalise as integral to policy effectiveness the costs and resources needed to counter opposition. The constitutive context of politics and institutions also needs mainstreaming into the study of policy and advocacy emerging from it (see Owen and Lloyd 2018 in the example of policies for Brexit). This rarely happens; it is also a demanding and open-ended empirical project (see Schaffer 1984, Fernandez 2012).

variables. Variables were grouped statistically as follows (Srinivasan 2004 p107-10) and were interpreted as dimensions of village level development.

1. Irrigated and dry agriculture with non-farm economic activity;

2. Poverty, social backwardness and low levels of human development;

3. Gender and caste;

4. Inequality in the assets distributions.

Factors 2 and 4 are most relevant to the way in which round three focussed on poverty. In factor 2, the 'syndrome' of associated variables included low levels of male and female literacy, child sex ratios adverse to girls, low agricultural income, low well-dependence. Factor 4 focusses on the proportion of small farmer households, the area they owned and operated, their debts and those of landless labouring households. The factor loadings were then analysed through hierarchical cluster analysis, from which five groups of villages emerged.[41] Among these groups 3/11 villages displayed poverty associated with *a dependence on agriculture, lack of economic diversification and low levels of human development*. In another 3/11 villages poverty was associated with high frequencies of *low and scheduled castes* (op cit p110-1). Average incomes in the richest 3 villages were *60% greater* than those in the poorest three villages (op cit, p105)

Only three of the original 11 villages were taken for the second stage of detailed survey: Nesal (classed as 'developed'), Vinayagapuram and Veerasambanur (classed as poor with a high incidence of scheduled caste households). All had economic relations with the local market town of Arni which involved migration and work and flows of money, commodities and investment. The analytical unit for the in-depth re-surveys became a *rural-urban complex*. Even within this small subset of villages however, while trends towards convergence in small scale production, increases in landlessness, and concentration among the elite could be found throughout, the inter-village variations in the development of assets and incomes had increased. The 'developed'village, Nesal, had become a suburb, yet it harboured the most *acutely differentiated assets inequality and poverty*. The wealthiest household in the village declared assets of $150,000 while the poorest (nearby) had $6. Nesal's Gini co-efficient for assets was extreme - 0.81 (Harriss-White et al 2004a, p13; Srinivasan 2004, p89 pp1-306). Meanwhile the most *remote village,* Veerasambanur, had the most generalised and most *persistent income and assets poverty.* (It was home to people with leprosy one mile distant from a specialist leprosy hospital but

[41] Labelled as suburban; developed; remote but commercialised; agricultural and underdeveloped; and scheduled caste and poor (Srinivasan 2004 p111).

not able to access treatment there (op cit p vxi). Responding to social science theories of poverty scaled at levels of abstraction above – and largely ignoring - the relations and agency of individuals, dimensions and relations of poverty were uncovered in the forms of outcomes and correlates of social units varying from collectives of individuals (e.g. age and gender), through households (e.g. caste, income and assets) to groups of households with similar economic interests (e.g. classes). In the analysis of round three case material from field-notes was interleaved illustratively.

Water and poverty

The production of paddy depends on water – up to 5 tonnes per kg of HYV paddy (Gathorne-Hardy 2013). Water for agriculture comes from three sources in the region studied: rainfall, surface sources: tanks, rivers and canals, and underground aquifers exploited using wells energised by electricity or diesel. Janakarajan (2004) reports rapid changes in all three sources: increased instability in rainfall distribution and increased frequencies of drought, the drying-up and decay of surface water-sources and the rapid depletion of subterranean water with declining dry-season water-tables, faster in dryland tracts than for wetlands.

He attributes these changes to a series of social and economic factors – ranging from the exit and replacement of Brahmin land-owners by lower status, locally dominant agrarian castes who lacked authority to manage the collective organisation of surface water resources (which had involved paid *Dalit* labour and which had become inactive by the 1990s) through encroachment on dried-up surface water bodies, cultivation in catchment areas and non-removal of tank silt, to the competitive sinking and deepening of privately owned wells, incentivised by power subsidies and in defiance of the regulations about well-spacing. As John Harriss had already concluded for the 1970s (1982, chapter 3) this was an agro-ecological crisis already decades in the making, and for Janakarajan it was one which causes agrarian poverty. In the early 1990s, private investment in well-water exceeded that of surface irrigation by a factor of 2.5. Investment in wells, well mechanisation and maintenance was spiralled in real terms, stressing small and marginal landowner disproportionately. Janakarajan records their increased debt, the emergence of water markets mediated through interlocked contracts for water, labour, money and commodities disadvantageous to-water purchasers in which labour was underpaid (compared with free casual labour contracts), commodity prices were tied to water-lords and lower and interest higher, forced reversed tenancy[42] and

[42] Reverse tenancy upends the norm of tenants being small-scale and landlords large-scale operators and is the renting out of small owned plots to larger tenants.

plot sales. He concludes strongly that the hydro-ecological crisis was differentiating and caused poverty.

Class and poverty

For the first time in these VLS, it was possible to identify social classes rigorously through pattern-seeking statistical computations[43]. Village household census data appropriate for the analysis of three major theories of mobility and differentiation[44] were submitted to cluster analysis. To denounce this as a sterile static exercise would be to miss a dramatic and robust result. In each of the three villages, agricultural livelihoods were increasingly wage labouring ones (Srinivasan 2004, p56-8, p95). Between 70-80% households were agricultural labour with zero to 1 acre of land. Within this labouring class the average incomes of landless labouring households were 40% lower than those of landed labouring households and the small set of non-agricultural households were 60% lower than landed labouring households. By contrast the top 15% of households dominated the ownership of both agricultural and non-agricultural assets and were accumulating capital in a great diversity of ways (Colatei and Harriss-White 2004 p 130 et seq). Between the big labouring class (also termed the poor peasantry in round three) and the rich elite, agricultural cost structures and the prices got for the marketed surpluses driving profits were specific to class – and often statistically significantly so. The marketed surplus of paddy grown by the elite was found to be 150% per acre of that of the landed fraction of the labouring class. Whereas paddy sales of the elite were price responsive, those of the hardly landed labouring class were inelastic to price. The elite captured 85% of formal credit (Harriss-White et al 2004a, p22-37). A threshold of 5 acres enabled access to the formal sector to approach the status of an entitlement. While village-level uniqueness in the configurations of credit institutions[45] is masked by generalisation, elite borrowers lent at cascading interest shaped by the urgency of demand, disparities in assets, caste, education, micro-monopolist social authority and the capacity to enforce interlocked contracts using threat and force

[43] Although John Harriss had dismissed these approaches, after E. P. Thompson, as 'mechanical' (1982 p216) and unrelated to human relations (op cit p134), the class classification of round three was an advance on ignoring social class completely (Hazell and Ramsamy 1991). It generated meaningful results too.

[44] Those of capitalist transition and class differentiation (reviewed in Thorner 1982; that of differentiation due to exchange relations (theorised in Bhaduri 1983) and those due to the demographic cycle of worker-dependent relations in households over generations (Chayanov, reviewed in HarrissJ 1982)

[45] These include state-managed credit and banking schemes (e.g. IRDP; land development banks), state-regulated private and public banks, money-lending dynasties, pawnbrokers, grain and silk traders, shopkeepers, elite farmers, chit fund organisers and itinerant moneylenders (Harriss-White and Colatei 2004, p278-9)

(Harriss-White and Colatei 2004 pp 257-62). Labouring households were increasingly unable to reproduce themselves socially without engagement with such markets, and their means of production were being commodified through exchange relations on adverse terms.[46] Patterns of expenditure were also clearly differentiated by class (Harriss-White and Janakarajan, 2004, p36-8). Until recently quantitative studies of village economies have been relatively neglectful of divisions in rural society not mapped by class or income.[47] In round three, caste was analysyed: local agrarian dominant castes (*Agamudayan Mudaliars* and *Vanniyars*) comprised the village elites, together commanding 90% of the three villages' land and non-land assets. These castes were also found in the labouring class. By contrast, scheduled caste households were excluded from the elite. Rarely owning any wetland, they predominated in the labouring class and were disproportionately poor in assets and incomes (Colatei and Harriss-White 2004a, pp140-52) – just as Harriss had explained for the 1970s.Caste-related conditions of work persisted as shapers of poverty.

Income and Expenditure Poverty and its Gendering

For the first time household incomes and expenditure were analysed statistically in relation to a locally specific official poverty line set at levels of expenditure ensuring a dietary/calorie minimum. From village to village between 29-36% households were below this poverty line; 20-30% had regular expenditures exceeding their incomes and the largest gaps were among the households below the PL. The gendering of households also shaped income poverty. 'South Indian women have had higher economic status than elsewhere.. due in material terms to their economic participation..to supportive patterns of cross-cousin, short-distance marriages and relatively low marriage expenses' (Harriss-White 2004b, p144). But declines in fertility and the rigidity of kinship rules and the replacement of bride price by dowry was increasing the costs of raising girls, reduced the support to and from women and reversed improvements in child sex ratios (Agnihotri 2000). The era of reforms had selectively intensified rather than dissolved the primordial structure of gender. Women's work-loads continued to be heavier than men's, socially reproductive work took priority over labour market participation, gendered productive tasks fetched lower returns for women who were disproportionately casual agricultural

[46] The exchange relations of labouring households were on terms involving higher input prices and lower product prices than were those for the agrarian elite class. These relations were often seasonally specific.
[47] See Himanshu, Lanjouw and Stern 2018 for the inclusion of caste in the econometric study of the UP village of Palanpur and Harriss-White. Harriss 1982 was a useful corrective for the NTN VLS.

labour and disportionately hired by the elite class.[48] Possessing less (or less valuable) collateral for loans than men, female debts tended to be male-mediated. Not all female headed households (FHHH) where the breadwinner was a woman were entirely assetless but they were 63% (disproportionately) landless. FHHH tended to be poor, entirely *female households* poorer, single women on their own even poorer and single women over the age of 61 on their own were poorest – eking out an existence from gleaning, collecting and drying cow-dung and receiving charity (op cit, pp144-56, p440). The agency of women in these forms of female households took active and passive forms. Female agency was restricted to lower-paid tasks in agriculture and faced significant barriers to participation in the non-farm economy (Jayaraj 2004); their capacity to contract debt (which *pace* Guerin's later 2014 findings was found to be compromised by their gender (Harriss-White and Colatei 2004, p265) could not protect against slipping into conditions of income poverty. Passive agency meant that aged, widowed or abandoned women were unable to prevent their exclusion from the right to be dependent on working sons, or had no working sons.[49]

Among the poor*, credit and debt* trigger upward as well as downward mobility, the trajectory depending on collateral, interest, use and risk. Tiny patches of land secure double the size of loans than those for landless borrowers. The latter are routinely excluded from pawnbrokers' loans and traders' credit (Harriss-White and Colatei 2004, pp271-3). While land is the most generative collateral the poorest don't deploy land as collateral because of fear of its loss. Instead, land screens eligibility. In place of land, poor borrowers have distinctive collaterals: pledges of future labour, utensils, gold, appeals to caste reputation, gender or third party reputational guarantees. And the interest rates they face are shaped by urgency but also by the marketability of their collateral. Every village had several unregistered chit funds structured by landholding, occupation, caste, gender and even political party allegiance. In Vinayagapuram and Nesal, women lenders and borrowers formed informal networks of finance unknown to their menfolk involving household items as collateral for petty amounts (e.g Rs 200) at annualised interest of up to 60%[50] (Harriss-White and Colatei 2004, p257-9)

<u>Rural diversification and poverty</u>

From round two, a spate of diversification into income elastic crops: vegetables, flowers, silkworms, fruit, milk was predicted (though the

[48] Despite some improvement in the gender elasticity of tasks, returns were shown to be unrelated to productivity in task-sequential systems and even lower for activities where women and men work together thus assumed due to the subordinating effects of gender ideology (reviewed in Harriss-White 2004 p159-66).
[49] Now were they able to broker access to meagre social security entitlements (Harriss-White 2004c)
[50] Constrasted with 12-14% for formal targeted credit and 24-36 % for bazaar credit.

processes of science and technology, and extension lying behind their diffusion lay beyond the scope of round two. Instead, round three found water-table depletion incentivising diversification into rain-fed cereals such as millets; while male out-migration encouraged the production of labour sparing crops such as tree crops. Starting in agriculture new practices also included intercropping, production of diverse varieties of the same crop, more complex cropping patterns, agro-pastoral mixes, and then occupational diversification into rural industries, crafts and services. This process was hardly detectable when data were collected for households as an aggregate of livelihoods. Village and field diaries revealed these processes at the granular level of individuals, seasonal shifts of activity and uniquely diverse trajectories (Srinivasan 2004, p87).

From the moment research revealed the emergence of the non-farm rural economy (Vaidyanathan, 1986; Chandrasekhar 1993), incentives and constraints on agency, variously theorised as social mobility, as differentiation and accumulation, have received much attention, particularly for the stylised binary pathways of compulsive (or 'distress' or debt-related) diversification (or diversification pushed by water scarcity e.g. into waste-work, shepherding or domestic service) versus voluntarism (or 'speculative') diversification (e.g. into trade or labour-contracting for construction). In round three in the early 1990s, de-agrarianisation and rural industrialisation was revealed as providing a mass of livelihoods to the lower agricultural castes which constitute the small peasantry and agricultural labour force[51], that result in the proliferation of household forms of production such as handloom silk weaving, glove sewing, petty scale paddy processing, dependent on commercial finance and on (black) investment capital seeping out of urban areas. These investment and occupational opportunities are heavily screened by class, caste and gender (Jayaraj 2004).

The hotly debated question whether income poverty was exacerbated by the terms and conditions of traders' interlocked contracts[52] (Bhaduri 1983, Janakarajan 1992) now had to be asked of urban non-agricultural traders'

[51] Jayaraj 2004 finds that of 703 households censused in the 3 villages with at least one source of income, of the 60% with land, half consider non-farm economic activity as their primary source of income and 75% as a secondary source. Of the 40% with no land, a third got their primary income from the nonfarm economy while 55% households had non-farm work as a secondary income source. These statistics are both more nuanced and more dramatic than All-India ones which find the rise in rural non-farm employment from 1972-1991 to be 17 – 30% for men and 11-15% for women (ibid p175).

[52] A single contract may lock land / water rent with labour obligations, interest and repayment conditions on loans and it may also fix commodity exchanges. They are theorised either as voluntary and mutually beneficial risk-reducing and transactions-costs minimising, efficient arrangements or forced, 'take it or leave it' class efficient ways of extracting surplus. Both theories may apply to different social circumstances (Harriss-White 2013).

non-agricultural credit ostensibly lent for activity like weaving but which could be diverted to agriculture and household consumption. Decentralised rural industrialisation (agricultural processing, handloom weaving, pottery) and services (from tuition and quackery to carting and snack-making) were characterised by technological backwardness, even by the use of children prised from school into the hardly-paid household labour force, suggesting that this rural industrialisation will not be a base from which a classic industrial capitalist labour process will emerge (Thorner 1982). Yet, locked in to markets, unable to withdraw into subsistence, these forms of unregistered petty production, trade and services were not to be dismissed - as scholars like Sanyal (2013) have suggested - as not capitalist. Rather, petty production is an analytically awkward and numerically large capitalist class form (Jan and Harriss-White forthcoming).

Multi-dimensional / human development poverty

Human development poverty diverges from income poverty in particular ways which were researched in round three (and contributed to generating a cross-continental project: Stewart et al 2008).[53]

Round three research into the multi-dimensionality of poverty revealed the tendency to a paradox of acquisition of even small assets (such as clothes, cupboards and stoves - of a kind sufficient to need to lock a hut) – nevertheless resulting in the increasing *poverty of life chances* for girls; culling them in infancy (Nillesen and Harriss-White 2004). *Health poverty* (defined in nutritional terms as households living below 40% of the food expenditure level of the local poverty line) is frequently caused by catastrophic expenditure for the shock of sickness, which pitches households into income poverty. *Disability*, which is subject to medicalised definitions and models (Lang 1999) but was understood by local people as incapacity to work, often results from conditions (such as deteriorating vision or deafness) not accepted by the state or the medical profession as impairing . Incapacities such as visual impairments developed from years of staring at the reflection of the sun while weeding in wet paddy fields, impairments to mobility resulting from accidents at night in poorly maintained and unlit village streets can develop in adulthood as well as in old age. In a rural economy running on manual labour, mild to moderate incapacities have been demonstrated to trigger downward mobility and dependence (HarrissJ 1982, Erb and Harriss White, 2002, 2004. In round three, while in the11 village census, one fifth of total households had at least one member chronically sick or disabled, a spin-off field project in 3

[53] This round of research into multi-dimensional poverty long preceded the multi-dimensional poverty index also created in Oxford. https://ophi.org.uk/wp-content/uploads/G-MPI_2018_2nd_INDIA_ch.pdf

nearby villages revealed that between 35-50% of people lived in households with a family member disabled in adulthood from occupation-related accidents, diseases and injuries (Erb and Harriss-White 2004 p 357-9). Though most impairment was never treated and did not result in stigmatising loss of social status[54], in two thirds of male cases and a third of female cases, the onset of disability had triggered downward mobility for entire households through the social mechanisms of draw-down of savings, increased debt, lack of earnings and direct and opportunity costs for other family members. Disability is economically differentiating, increasing intra-village inequality and affecting landless labouring households worst (Erb and Harriss-White 2004, pp362-3). Elite households are better able to bear the extra costs and changes in work-loads. *Undernutrition* persists. While (using the same nutrition indicators) nutrition poverty had halved from its 1980s levels, around 30-40% of poor peasants and landless labour households (varying with village) still experienced nutrition stress and food insecurity (Harriss-White 2004d, p387-88). Against the hypothesis that educational attainment would improve over time, round three found from cross-generational evidence of primary education that *educational deprivation/poverty* was shown to persist in poorly educated households across generations (Gold and Harriss-White 2004). Last, round three examined the pauperising access to the state of those poor people eligible for social protection, taking the *old age* pension as an example. Delayed payments (officially 3 months, actually varying between villages between 6 to 18 months), bribes to a great range of officials and professionals, transactions costs amounting to 3 to 4 months of the expected benefit, party-politicisation, errors of inclusion of the ineligible and a far worse error - that of exclusion of the eligible - were experienced as routine. On average only one third of those eligible for pensions received them. The remote and relatively poor village of Veerasambanur seemed to have a lower proportion of its population over 65, and fewer eligible beneficiaries and was speculated to be less advanced in its demographic transition. Widows' pensions were found with few exceptions to be captured by ineligible people. Bureaucratic and social barriers and relations of exclusion mean that pensions provision was pauperising (Harriss-White 2004c pp437-443).

Poverty modelling

Another novelty of round three was that we modelled the processes of poverty – not as a general equilibrium system of equations as in round two, but in terms of specific relationships. While round six focusses on individuals, their relations and their agency, the models of round three are

[54] See Lang 1999 on the social stigma associated with disability particularly among children in S. India. In the villages we studied only one child born with disabilities survived.

calibrated[55] at levels above the individual, but show how institutions[56] and social structure[57] matter to individuals. Though there is no consensus in social science on the institutions that are vital to the economy (Wolf 2007), they were studied more systematically in round three than in other rounds either earlier or later.

The first institutions modelled were money, private property, labour, technology, inputs and product markets, infrastructure and gender norms. Income poverty as the condition of *surplus labour* was modelled in terms of structures for which official data were available (Jayaraj 2004 pp178-194). Tests of the model confirmed that pressure of population on land, labour-displacing technical change in agriculture, distress commercialisation of agriculture mediated through changes in the institutions of labour markets (casualization, caste, gender); state policies (e. g. reservation incomes starting to be supplied by social sector and food policies, the (non)existence of infrastructure and transport) and household / social norms (e.g. lack of female education) generated income poverty.

Income below the poverty line was also modelled using class probability tree rules (Saith and Harriss-White 2004). In 8/11 villages there were data sufficient to split the sample of households into halves above and below the PL. Households' own self-classifications as poor or not-poor could be compared with the results of 478 variables assessed by the probability tree. Robust predictors of poverty were little land, low production, small loans and female participation in agricultural labour (op cit p316). Re-run with a smaller set of 75 'non-fudgeable' variables, the predictors of income poverty were 'being scheduled caste', high ratios of dependents and sick family members, low agricultural assets values (like land or pump-sets), low values for agricultural tools, houses/huts, and very little involvement in the non-farm economy.

[55] Set and adjusted in order to allow comparison.

[56] In a review of the multiple meanings of institution across a range of social science disciplines and paradigms, Hodgson justifies a Veblenian definition consistent with its use in round three: institutions are potentially codifiable social rules structuring social interaction, existing through social agency even when not actively enacted but facilitating individual agency and shaping the changes individual agency produces (Hodgson 2006). Hodgson has also developed the concept of 'reconstitutive downward causation' in which institutions shape agency by acting upon individual habits and dispositions. (Hodgson 2003). Ways to develop a systematic taxonomy of institutions have remained a heavily contested work in progress for over a century.

[57] Structure is also a concept subject to multiple meanings. Structure may transcend the social realm - as in demographic structure that is uncodified in discourse or as in the structure of language acquired in infancy, or what Lawson calls natural mechanisms (Lawson 2003). It may indicate a matrix of institutions not reducible to individual behaviour – as in the social structure of accumulation – which have been theorised interact to stabilise capital crises in which are due to their unravelling (reviewed in McDonough et al 2017). In round three, structure was introduced for the first time in the latter sense of a matrix of institutions but without the implications for crisis, which were outside the scope of this – or to this day any other - study of India (see a further discussion in Harriss-White 2003).

A third approach to modelling involved the feedback relation between *disability and poverty* (Erb and Harriss-White 2004 p353-5). Disability is roughly estimated as affecting 10-20% of the population, though if mortality from disability is maximised among the poor, the incidence of disability will be lowered. Since villagers understand disability as the incapacity to work, the relation between disability and poverty is direct. But poverty raises the probability of disability through malnutrition, higher exposure to accidents and occupational injuries, and lack of access to health care. Such feedback relationships are the manifestation of what Arun Sen has conceptualised as *simultaneous deprivation.*[58] Households with disabled members were more likely to have incomes below the PL, and smaller assets. Direct and opportunity costs – losses - to the economy from self-reported disability were simulated at 8%, twice that estimated for malnutrition and evaluated as horrifying (p 364). A *poverty trajectory* was then stylised for a model household from case material about the economic impact of disability: loss of earnings and increased costs, drawing down of savings, increased debt, debt at increasingly high interest, sale of female assets, begging. It bears a resemblance to the strategies of coping and survival during the onset of famine that were researched and theorised in the 1980s – along with their irreversible ratchet effects (Rangasami 1985, Devereux 1988, Erb and Harriss-White 2004, p362).

The fourth model examined the *reproduction of income and educational poverty* across generations through educational deprivation. Poor educational attainment (under 5 years) was modelled - and confirmed by village level evidence- as resulting statistically from three kinds of characteristics; first, proximate factors such as the attributes of the individual (e.g. parent's education, birth order) second, social institutions which shape the economic returns to education (such as gender barriers to many types of work) and third, factors theorised in development erconomics as 'structural' which work at the levels of the household (e.g. income); economic class and social status (caste).

These modelling approaches move away from a focus on the GR technology but they are not irrelevant to round six, because they show how agricultural technology is nested in many other constitutive features of the rural economy and society. First, although not claiming exhaustiveness, the institutions comprising rural social structure and conditioning agriculture and rural poverty - as conceived and explored by the round three team - involved: villages; property relations and control over the social and

[58] Simultaneous deprivation is a syndrome involving the combination of poverty, low caste, large or very small household sizes, poor adult care, the ideological reinforcement of low status and stigma, punitive expectations, cognitive and verbal constraints, psychological extinction, stimulus deprivation, which shapes the terms and conditions of socialisation and work (Sen 1992).

technological production of the biosphere and its dangers; institutions of capitalist production, markets and exchange – water, land, labour, money, inputs, commodities; households demography and kinship,productive agricultureal and non-agricultural assets, reproductive institutions of education, health and age; social norms of caste, class, gender, income and self-identification of poverty; the state: productive insgtitutions of infrastructure and electricity, inputs provisions and subsidies, market regulation and reproductive institutions including social security. The institutions operate at different social scales and bundle other finer-grained ones (as can be seen in the many formal and informal institutions comprising rural money markets and arrangements). Second, these models focus on downward mobility and economic ratchets.[59] While round six's life histories of poverty relations will generate novel granular detail, round three shows how the contexts of poor education, health insults, calorie scarcity, low caste and gender subordination inter-relate in a syndrome of multi-dimensional poverty. In turn the close negative relation between land ownership and poverty shows how households with poor levels of human development have made less productive use of the GR technology: their yields are lower, they diversify least, their use of inputs, especially pesticides is least intensive, their debts are at higher interest than among the agrarian elite. *Pace* Rem Koolhaas and Bruno Latour, context doesn't stink, it matters. And context includes the state.

Anti poverty policy that pauperises

Round three unearthed sets of relations inside the state which caused policies that were formally intended to create and/or secure livelihoods, incomes or wealth to have pauperising effects. One mechanism operates through the very architecture of government. Over and above the Tamil Nadu state's agriculture department, productivist policy for agriculture can be found in four other departments, five parastatal corporations and even more banks and finance institutions with responsibilities further divided between central and state governments. Massive problems of co-ordination between ministries and departments result which can result in botched linkages which exclude the poor. Wage protection for labour for instance avoids agriculture. Credit for rural development does not include loans for land purchase by scheduled caste landless producers. Rural health ignores the occupation-related incapacities of agricultural workers (Harriss-White 2002). Regulative law rarely is implemented so as to cover its formally intended reach, leaving citizens unprotected. We now know that post-independence regulative law protecting labour was quite deliberately

[59] The kick-starting of accumulation pathways has been proxied only by crude estimates of increases in real income or earnings by occupation, class or income level.

restricted to the larger firms, leaving most of the economy formally unprotected (Dietrich Wielenga 2019). Then policies need enabling conditions to be implemented as intended.[60] In turn these will need policies. But policy advocacy, while institutionally shaped, rarely incorporates its institutional preconditions, many of which are informal. To illustrate, the maintenance of social status distances, means water towers are sited out of reach of Dalits. And because under patriarchal relations women remain relatively unskilled, they tend to be debarred from the non-farm economy. Threats and reforms to policy like the PDS and NMS that are driven by neo-liberal ideology (Swaminathan 2009) weaken its vitally important redistributive effects. And the round three field studies of social security in Tiruvannamalai villages showed how officials themselves practice predatory and extractive agency on poor clients.

[60] See Trubek and Galanter 1974 for the implications of not examining legal preconditions necessary for law and development. In India most policies require at a minimum the elimination of fraud and corruption, prompt and full finance, preconditions which are air-brushed from policy (Guhan and Paul 1999).

Round four: in the early 21st century

Organisation

Round four was never intended to resemble the first three, instead it emerged from a set of small, individual field studies in the villages and town. It was spread over a 'long decade' from 1997 to 2009 and carried out mostly by research students from India (JNU and MIDS), Italy (Rome University) and the UK (Oxford). Eight scholars worked alone or in small groups with much smaller research resources. In this round, having a much smaller team affected how the village research was conducted. Individual researchers studied different themes in different ways.

Objectives and Contexts

In the 21st century two kinds of context forced further radical changes to the field research, changes that were planned after reconnaissance/'piloting'. The first involved the distinctive characteristics of regional economic development in northern Tamil Nadu over the previous 3-4 decades: i) the generalisation of commodity exchange combined with a chronic agrarian crisis, ii) the persistence and growth of the informal economy amid the development of long distance commodity flows into and out of national markets, and the emergence of international agro-exports, iii) rural-urban commuting and migration and iv) two-way flows of rural and urban investment stratified by caste. In response to these, the centre of gravity of round four shifted decisively to the local market town,[61] and the question of agrarian poverty became literally peripheral.

The second change in the kind of context was that, in line with the underlying philosophy of theoretical pluralism in previous rounds, the 21st century project developed concepts which coped both with general processes and with the complex local particularities through which the local economy and society developed a *specific character*. No attempt was made to generalise above the area researched or to compare with other regions. The fourth round explored rural-urban relations and structural transformations[62] and social character of local capitalism and the competence of the capitalist class. Earlier rounds of research were mined for their insights into the processes that led to what was observed in the 21st century.

[61] This was the most explicitly urban round of research but from the start in 1973-4 the economic base of the local town has also been studied alongside the villages – and - like the rural project, used to scrutinise and criticise theory – first growth centres (Harriss 1976), then parasitic and generative urbanism (Harriss and Harriss 1984), then the informal institutions of capitalism (Harriss-White 2015)

[62] In development economics and political economy, structural transformation is the reallocation of economic activity across the sectors of agriculture, manufacturing industry and services. Economic sectors are thus structures.

Local capital accumulation was analysed first through a Gramscian lens of hegemony, creatively reinterpreted for caste society as caste-corporatist development (Basile 2013) and second through questions about innovation and the matrix of informal economic institutions in which invention, adaptive and adoptive innovation take place (Roman 2008). In specific sectors of the economy (rice, silk and gold) researchers explored the '*quiddity'* – the social and physical character – of the commodity in question and the cultural constructs and practices through which quantitative calculations of operating costs, wages, prices, interest and rents were both enabled and constrained. The economic and political roles of concepts of individual merit, honour and trust mediated through caste loyalties were researched (Harriss-White 1996b, Cavalcante 2015). Doing this work on individual sectors led the team to engage with theories of the dynamics of spatially clustered development, including theories of the knowledge economy, and of situated cluster-based innovative capabilities and learning which were applied to understand technical change initiated by weaving labour as well as maintenance engineers and owners in home-based and workshop craft silk production (Roman 2015). Srinivasan (2015) explored livelihoods in an exhaustive study of urban and suburban labour arrangements, using theories of labour mobility and labour market segmentation.

Whereas previous rounds had censused all 11 randomly selected villages, in round four of the VLS, a census was taken only of the three studied in detail in round three (Arivukkarasi 2015). While institutions were researched in detail, the complex dynamics of urban-rural credit relations alone showed how both old and new institutional economics were deficient (Polzin 2015).[63] And while the agrarian crisis and agricultural poverty had hitherto been approached with a primary concern for production, in this round, for the first time, drawing on theories of mass consumption, the way people who were financially distressed (whose food expenses exceeded their stated income) spent what money they had was researched (Cavalcante 2015).

As in round three, policy discourse and practice were theorised as stylised, conflictual and implemented not simply by the state but through the

[63] See Polzin 2015 Table 9.2 for a summary of institutional changes in credit in a single village from 1994-2006. Predictions from old and new institutional economics involved a comparison of definitions, analytical units, theoretical assumptions, assumptions about determinants and processes of change in Commons (OIE) and in North (NIE). The empirical results informed a critique of Commons for the inadequacy of his concept of artificial (purposeful) selection according to ethical ideas of fitness as the motor of institutional change; of North for the inadequacy of relative prices and tastes as drivers of change; and of both for ignoring i) how uncertain economic shocks can and do cause radical change and ii) how differential capabilities resulting from status or class groups enable institutions to be structured, to persist or change and iii) how power, social processes and resistance operate within institutions.

processes of micro politics of caste associations, trade unions and business associations (Basile and Harriss-White 1999, Basile 2015). Their detail and the impact of changes of formal regulative rules on the local rural-urban informal economy were mapped for the cases of weaving, rice processing and gold craft objects (Roman 2008, Harriss-White 2015, Stanley 2015)

Despite this piecemeal approach to research, the field methods remained the same: a combination of research on entire populations (urban business associations and silk weaving), samples (random quota samples of agricultural households, stakeholder samples for credit, stratified random samples of urban labour, of urban businesses and of rice mills), case studies (of gold craft, of innovation and of labour) and ethnographic research (on silk and on credit). Focus groups and participatory rural appraisal were used for the first time in the three villages since Chambers championed them four decades earlier (Cavalcante 2015). Parts of round four were thus sited in villages but not on villages, though it might be argued that since the research aspired to analyse an entire region it was thus both 'in' and 'on' the villages which formed a part of it. Some well-established conceptual categories were interrogated. Town and country, for example, were found to be terms indicating entities that were 'porous', given the constant flows of people, commodities, money and investment (detailed in Basile 2013). Labour market transformation was found to start in villages and develop in the town to which labour commutes and migrates. Investments and money flowed from urban to intensely localised rural sites and back. The 'urban settlement' emerged as a set of overlapping territorial containers of people, money, materials, with significant implications for public infrastructure. A peripheral ring of villages engulfed by the expansion of the town but not incorporated into its Municipal government, or its five year plan, placed demands on urban infrastructure which the prevailing culture of fiscal non-compliance and revenue famine could not meet.[64] Over the 'rurban' region, regulative failure did not simply result from lack of resources, it was shown to be at the deliberate political behest of local elites: a pollution control board with but one officer without a vehicle benefits no interest save that of the polluters. The same applied to inspectors of labour or of schools and the interests of factory owners or headmasters.

Results relevant to Rural Poverty

In agriculture, changes to cropping patterns were not so much income-elastic as increasingly sparing of water and labour. A new generation of

[64] India's pervasive culture of fiscal non-compliance results in large scale tax evasion (Jairaj and Harriss-White 2006, Kumar 2002). This unfolds at all scales from the black corporate economy and international capital flight (Kar 2010) down to the failure of local business families to pay municipal taxes for professions and on property (Harriss-White 2015c).

high-yielding varieties of rice bred to be labour sparing, together with labour displacement due to mechanisation in production and processing threatened as never before the livelihoods of landless labouring households. At the same time, water table depletion and a chronic cost-price scissors reduced returns to agriculture. The labour demands of weaving were incompatible with those of small-holdler agriculture and many weavers sold plots. In the three villages, the proportion of households landless doubled in the 15-year period to 2009 (Arivukkarasi 2015).[65] The commonest response has been distress-induced migration to the local town and far beyond, where workers then encounter the social barriers in the labour markets described by Srinivasan (2015). Their *remittances* have proved exiguous (Cavalcante 2015).[66] Despite incomes being low enough to threaten food security, Cavalcante's case material shows that positional or status goods such as televisions and mobile phones (sold in the local town) were nonetheless being preferred to food. The real costs of marriages were reported as being on the increase, as were those of (private) education. Pressured by fashion, by media coverage and by social imitation, households below the poverty line dug into savings, contracted debt or omitted meals in order to maintain the visible elements of a socially decent standard of living (ibid).

Rural credit institutions witnessed dramatic changes in the first decade of the 21st century: some formerly dominant local institutions have disappeared (a money-lending dynasty, chit funds, grain *mundi* credit); entirely new ones have appeared (self-help groups, instalment credit from mobile traders from town); a few have persisted (pawn-broking, informal lending, formal banking). Processes of destruction, creation, re-working, and persistence are at work. Persistence may not indicate absence of change in an institution; it may result from evenly balanced but opposed forces. Round four generated examples of sticky gender division of tasks in agriculture resulting from challenges by women and rebuffs by men; and of child labour perpetuated despite aspirations for schooling due to an earning family member's sickness.[67]

Apart from Polzin's analysis of credit, Arivukkarasi (2015) explored the 'rural non-farm economy' through surveys and case studies of the dynamic centralization and decentralization, concentration and dispersion, of craft

[65] Arivukkarasi (2015) reports intensified rates of landlessness, outmigration and land sales by weaving households (for whom agricultural work was incompatible) who subsequently had nothing to fall back on when displaced in one of the cyclical downturns of the silk economy.

[66] For an analysis of the role of remittances in India's rural economy using NSSO data for 2007-8 see Tumbe 2011.

[67] An example, though with the labouring class, of the relations or skein of Latourian 'ties', which are here balanced towards institutional status, but alterations in which which may generate a fluid 'translation' (Latour 1999).

production in silk handloom weaving.[68] She found landed silk weavers poorer than those without land. In recent decades, a first wave of technological innovation (from *dharmavaram* to *korvai* looms) meant an increased need for several shuttles and assistance with 3-4 yarn threads – and so a retrogression in the labour process with a rise in *child labour*. A subsequent wave of technical change (back to *dharmavaram*) was driven not by demand or the structure of material incentives but by the *aspirations of weavers*- by the preference of wage-earning weavers for school for their children - to which traders were forced to accede. The latest technological change recorded by Aravukkarasi involved the entry in the town of power looms using Chinese yarn, and displacing handlooms from villages. This process of labour displacement was highly socially structured. With a few exception from the suburban village of Nesal, *Dalit* and/or female weavers are most dispensable and the weaving labour force reverted to being male-dominated. Participation in weaving was both socially and economically differentiated and differentiating. Aravukkarasi concluded that weaving has not been a route out of poverty, especially for *Dalits*.

Round four found that oppressive exploitative, gendered labour arrangements and the displacement of labour through technological change were widespread in both agriculture and craft production. Labour displacement was being offset or 'compensated' for by the employment multipliers generated by commodification and the adoption and diffusion of new goods and services.[69] Of course such compensation was not direct but structural, and uncompensated displaced labour would be pauperised.

Meanwhile, field research on local urban and rural labour markets found them durably segmented by occupation, sector, social identity (patriarchy, caste and gender) and by economic institutions (e.g. the family and collective preconditions for competition such as business associations). Although it is conflated with wage labour both in economic theory and in Indian labour law, local people make a distinction between self-employment/petty production[70] and wage labour in both agriculture and the non-farm

[68] Other than with respect to silk, the non-farm village economy was not studied in the detail of round three or Wanmali's (1991) work in round two. In describing the redeployment of displaced weavers Arivukkarasi outlines non-farm livelihoods available in villages : bunding, loading, brick-kiln work, painting and roofing, bore well labour, electrical work, parboiling and drying rice, cleaning and driving lorries, cooking and waiting in local meals hotels, serving in shops. The region continued to generate recruits to military service.

[69] Commodification is a process in constant expansion involving transformations from use value to exchange value, production at ever increasing scale and selectively-gendered displacement of labour. At the same time, as Huws (2003) has theorised, the requirements of newly commodified goods and services for maintenance and repair, create livelihoods. Harriss-White (2005) develops the analysis for the gendered petty commodification of rice in India.

[70] Petty commodity production is an umbrella term in political economy also covering trade, small scale finance and services.

economy. Petty production has been subject to debated interpretations: as disguised wage labour, as blockages to capitalist development, or as a more or less autonomous form of production grounded in the family. Certain it is that it expands and thrives through the multiplication of small firms, and not in the form of concentrated and centralised capital (Harriss-White 2018). Social discrimination structures petty production quite durably over the decades (through access to apprenticeships, occupational choices, sites, contacts, credit etc restricting sectoral mobility. Since it requires access to capital, technological change is deeply embedded in the process of class formation and, since class and caste are still considerably congruent institutions and women are durably subordinated in this region, technological change is rarely unembedded in relations of social identity. Field evidence suggests the hypothesis that innovation in the non-farm economy is most commonly incremental as opposed to radical or disruptive; it is slowly and unevenly being disembedded from local knowledge resources, themselves structured by caste and class.[71]

The caste-corporatist regulation by some 60 business associations of the local urban commodity economy is able to control the entry of firms, the labour force, and other means of stabilising the accumulation prospects of those who already have some capital (Basile 2013). Poor owners of small firms are admitted to these associations but once admitted their interests are not politically represented. Collective action is not to be understood as harmonious, but as exclusivist and internally conflictual. In such ways, the local institutions of capitalism, some new (informal accreditations for competence, access to urban bank loans), some persisting (gendered property relations), some changing (male control of men in family businesses) while some are destroyed (craft production), create poverty alongside wealth in an urban economy in which much activity is unregistered and unregulated by the state.

However, the 21st century research further enriched conceptions of poverty. While the 1990s VLS – round three - developed the concept of rural poverty as *multidimensional*, in the 21st century, Cavalcante theorised it as *relational,*rather than absolute or static. Against a corpus of scholarship quantifying poverty in relation to heavily disputed 'poverty lines', Cavalcante, developing a consumptionist approach to poverty, revealed it as

[71] Harriss-White 2017 presents examples of the diffusion of local inventions structured by caste (low caste rural electricians making three phase equipment for two phase power supplies) class (lorry cab design) gender (both these examples are male); of adapting innovation to local conditions: as when women learn new skills for power loom weaving; and the commonest form of innovation – adoptive – exemplified in 'automated'/fully mechanised rice processing (by the dominant agrarian castes and local business class); Roman 2015 reveals innovations by labour in computer-aided design.

a *lack of the capacity and resources to emulate.* In the three villages, he found poor people intensifying pauperising debt to acquire visible status goods in preference to food (Cavalcante 2015). Yet against evidence of the pauperising role of debt, Polzin's study of Vinagapuram revealed cases of *indebtedness* enabling upward mobility and exit from poverty for women taking loans without individual on third party guarantees in security self help groups, established from 2000 (Polzin 2015). Against arguments about the transformation of caste relations, we found that being *Dalit* in these villages means a kind of *status-poverty* which can – with few exceptions involving education - be escaped and transcended only by migration, by being relabelled in anonymous and cosmopolitan social contexts and by working in new caste-neutral occupations – i.e. outside the frame of the agrarian.

'Agency' – understood as purposeful economic action - has not been directly analysed at the individual level but is reflected through its outcomes and implications in the context of the theories (of institutional change, innovation and consumer behaviour) employed in round four.

Round Five – 2012-14

Organisation

The fifth round was co-ordinated from Oxford with a network of Indian (agricultural) economists, engineers, and political scientists, each from a different Indian institution (D.N. Reddy and M Venkatanarayana, NIRD, Hyderabad; Deepak Mishra, JNU; Aseem Prakash, Institute of Human Development, New Delhi and TISS Hyderabad; Gautam Mody, New Trade Union Initiative (New Delhi), Mohan Mani and Meghna Sukumar from the Centre for Workers' Management in Bangalore and Chennai). From Oxford Alfred Gathorne-Hardy, an environmental scientist, joined forces with Harriss-White, a political economist. Energy technologist Sanjeev Ghotge from WISE, Pune was also closely consulted. Field investigators, a team of experienced NGO workers from the Gandhian Unit for Integrated Development Education and a range of expert stakeholders and advisers completed our base of intellectual resources.[72]

Objectives and Context

As the ecological crisis deepened in NTN, in India and globally, the fifth round of VLS set out to remedy the growing neglect of *nature* in the VLS rounds other than the first and third. Eight historical processes and arguments made this approach inevitable:

i) the uniquely large and still growing informal economy which is not registered or regulated by the state, but which constitutes an important element in India's global competitive advantage and is vital to the electoral debate about jobs, while statistics about it are a matter of refined guess-work and extrapolation (Sinha et al 2007, Ghosh and Chandrasekhar 2013, ILO 2018);

ii) the fact that all activity creates waste, while economics externalises and generally ignores it or at most admits it as a low status field of research and policy, making it in urgent need of rehabilitation;

iii) the fact that nature not only generates resources but also processes waste (the atmosphere being merely the most politically acknowledged and accepted 'sink' of waste);

iv) the fact that the waste-generating activities of agriculture have been exceptionally overlooked until very recently, their being treated as a 'floor of waste' which cannot be reduced because of the primacy of food supply for a rapidly urbanising society (Anderson and Bows 2011);

v) the fact that while it is unscientific to a degree to reduce the ecological crisis to climate change (Rockstrom et al 2009), Green House Gases (GHG) are none the less critical for climate change, making it vitally important to

[72] The project is to be found here: https://www.southasia.ox.ac.uk/research-projects/resources-greenhouse-gases-technology-and-jobs-in-indias-informal-economy-the-case-of-rice

develop methods to measure GHGs where regular official statistics are lacking - and where better in the informal economy than in agriculture?;
vi) the recognition that GHG hotspots in agriculture should not be regarded as sacrosanct and that means to mitigate them should be sought;
vii) the recognition that such means would need to be subject to the conditions of a) being practicable at market prices and b) not displacing labour without compensation – a process which would need costing too.
viii) last, awareness that while the quality and quantity of informal jobs and livelihoods in rice production and distribution were seen both powerful indicators of poverty and suggestive of anti-poverty trajectories through work, their effects on pollution were as yet unknown.

While all three villages were re-visited, only one of the original 11 villages, Vinayagapuram, was taken for intensive study, because the objective was to find comparable sites in which to gather evidence for the waste created in a range of production methods and post-harvest market systems/supply chains.[73] (We also needed villages that were not already complaining vociferously about survey fatigue.) In Northern Tamil Nadu we studied two production technologies: HYV/intensive/chemicals-based rice production, and organic rice production. For both robust estimates and comparative purposes we studied SRI and HYV technology in Warangal district, Andhra Pradesh; and rainfed rice ('organic', due to poverty) in Koraput and Nuapara (part of undivided Kalahandi district) in Orissa/Odisha. So the project focussed intensively and exclusively on rice, and by now almost all the producers in these villages were small and marginal landowners. As in round four, this new use for VLS involved research *in* villages but not *on* villages (and their social and economic structure and relations). We also researched the economics and pollution of the post-harvest supply chain in Northern Tamil Nadu 'downstream' of production, to its retail points in supermarkets and small family stores, and we returned to the villages for a public engagement about less polluting technological options. This involved male and female small and marginal farmers and landless agricultural labourers in a truncated sample which also involved highly educated (urban-based) experts. In many respects this fifth round was unlike the earlier rounds.

Methodologically and analytically, it also involved engaging with nearly a score of distinct thematic or disciplinary sub-fields of development[74]: climate change, ecological economics, agriculture, rice, agricultural economics,

[73] Constraints of resources prevented our studying the GHGs embodied in research and development systems but the embedded GHGs of inputs production were computed – see Gathorne-Hardy 2013.
[74] A sub-field is recognised by vocabulary and discourse, specialist journals and epistemic communities of scholars.

value chains, supply chains, systems of provisioning, food systems, innovation systems, labour studies, policy studies, science and technology studies, informal economy and multi-criteria analysis and mapping. To a considerable extent, though not completely, the social science with which we engaged was governed by the need for it to be compatible with life cycle assessment, a method from environmental science which we treated as authoritative. We also invented a process of collective learning to bond a multidisciplinary team.[75]

Results relevant to poverty

How has poverty been measured? In round five, it was first measured through the a priori category of land-ownership below the state mean of 2 ha, where plenty of existing research supports the assumption that such households are income-poor (reviewed in Dhas 2012).[76] Second, agricultural labour households are also poor: the poverty of labour was measured not through household income but instead through *work-effort* (calorie expenditure) and *wages* in the minutely detailed tasks of the production-distribution system. These were the categories through which GHGs were computed. Costs and prices were measured for farms and firms (exposed as crude analytical units when compared with the minutiae of the task-level detail required for life cycle assessment of GHG emissions(Gathorne-Hardy 2015). Costs were collected to be analysed in three ways: in terms of market prices, in social terms (market prices corrected for subsidies), and in environmental terms (with costs imputed for 'negative externalities').

Round five's research results were replete with inconvenient findings and some paradoxes.

1.While pollution has poverty-creating impacts (pesticides and polluted water, chemical poisoning and other pauperising diseases of field labour), the escape from income poverty increases pollution both immediately where people live and work and pervasively in GHG generation (greater use of agro-chemicals which pollute water, pollution from saline incursions and salination; class differences in GHG).[77] Polluting pathways out of poverty need much more research, as do mitigation pathways of non-poor people.

2. Irrigation water and agricultural electricity are – for different reasons - free of private costs but constitute the most important single GHG pollutants in the entire agricultural production-distribution system due to

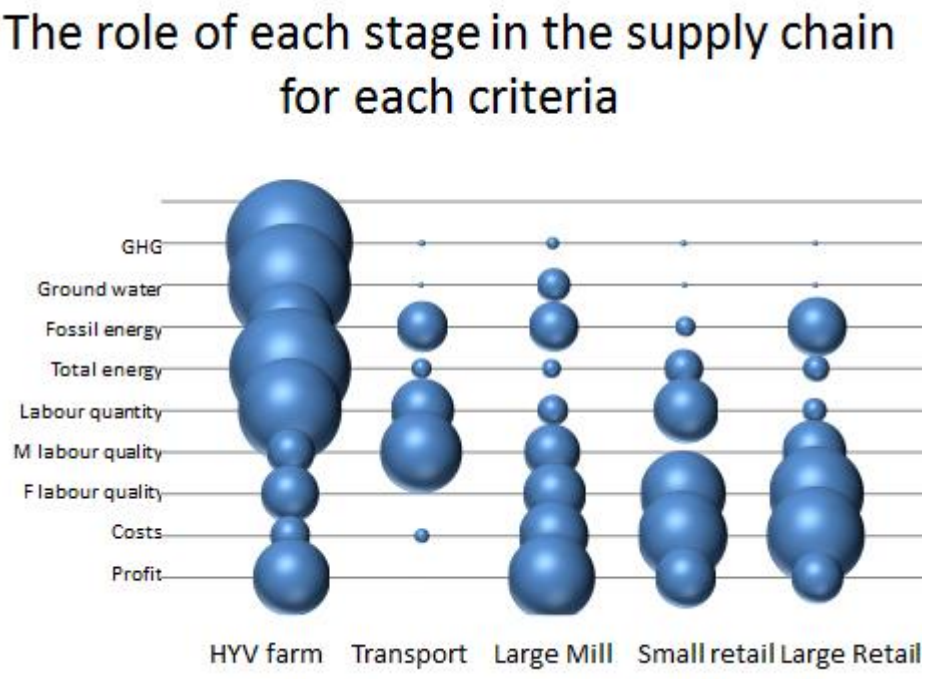
[75] See Learning Workshops here: https://www.southasia.ox.ac.uk/research-projects/resources-greenhouse-gases-technology-and-jobs-in-indias-informal-economy-the-case-of-rice#tab-707936

[76] In theory with income streams from labour in the non-farm economy, this relation could be weaker over time. In practice the relation between landholding and rural poverty is strong.

[77] See Chancel and Piketty 2015

the fossil fuel content of water lifting technology for irrigation- see Diagram 1.

DIAGRAM 1: STAGES IN HYV RICE PRODUCTION, ENVIRONMENTAL ECONOMIC AND SOCIAL CHARACTERISTICS



3. Agricultural labour, was measured by task and aggregated in a new concept unfamiliar to social scientists: minutes of work per kg of paddy. On average, HYV rice in TN and AP requires 7.5 minutes/kg[78]while rain-fed rice in Odisha requires 50 minutes.[79] Demand for labour in rice production is generally for low skill, effortful, low wage work mainly at the stages of transplanting and weeding. So one labour paradox is that technology that lowers GHGs increases demand for low quality work at poverty wages. A second paradox is between GHG reduction using technology that increases demand for *women's work* (weeding) with rates of pay for them that are up to 60% below those for male labour and far below official minimum wages (Gathorne-Hardy, 2015).

4. A fourth seeming paradox is of innovativeness and the failure to adopt or make the decision to give up technology. The question of innovation was revisited, for the first time since 1973-4, for its implications for climate change, agriculture and jobs. Local 'small business' associations, small farmers and labour were once again found to be innovative in all senses of the term: invention (electricians invented modifications for electricity storage); adaptive innovation (CAD training for poorly educated rural boys; improvements to weeders); and adoptive innovation (sprinklers, bore-wells

[78] 450 labour-days per hectare (Harriss-White and Janakarajan 2004 p35)

[79] See Gathorne-Hardy 2013 for details

etc) (Harriss-White 2017). Yet comparatively new, less environmentally damaging (GHG reducing) agricultural technology (such as SRI, organic rice, rainfed rice, solar pumps and reductions in transmission and distribution losses) were *known about but not adopted* by small and marginal farmers. Explaining this paradox is work in progress. [80] It requires - inter alia – the analysis of the high cost structures and front-end loading of capital costs that typify much low-GHG technology. The capital costs of solar pumps, for instance, were 90% of total costs and unaffordable; available subsidies were not available to small farmers; and solar energy technologies were geared to pumpset sizes requiring collective action to operate, which was not (yet) feasible.

[80] This has now been thoroughly researched for SRI – see Taylor and Bhasme 2018

General comments on the five rounds

Taking the five rounds of VLS as a whole, if, as is posited by Callon (1998), the economy is 'performed through economics' rather than being embedded in society and nature, then at least this tour d'horizon of the varied economics of the green revolution and - necessarily – of its effects on poverty and on nature and its multipliers in rural diversification would indeed suggest 'multiple performances' and 'many worlds'.

Poverty in these villages has not evolved in a way that is consistent with any general principle of development. Neither has its study. While Indian VLS may reveal many more approaches to mobility and poverty than in the NTN villages, for the moment these villages are our universe.[81] Theoretical and discursive/terminological pluralism is embedded in this longitudinal research. A distinctive characteristic of the project is its unstable analytical categories, toolkits, and measurements, and constant awareness of reductionism. The narrative is shot through with binaries (agriculture:non-farm-economy/rural:urban/ informal:formal/ capital:labour /big:small/adopters:non-adopters:de-adopters / poor non-poor etc). The measurement conventions of disciplines vary a great deal. Just as the household, the farm and the firm are all fluid, contested and reclassified socio-spatial categories, so too is the village. The village as a residential unit or as a unit for water management (F p132) is not a unit for work, let alone for stocks and flows of commodities, money and investment, let alone a unit for the revenue administration. All this has hampered rigorous comparisons over time (Srinivasan 2004). And though the LTVS project was dominated by economics, it did not make poverty central despite being concerned about it – poverty was an input to relations of production, distribution and consumption, an outcome of a set of relations and contingencies , a process, an indicator of the failure of policies and processes. *A central focus on poverty is unique to round six*.

The list in Table 1 shows the many ways in which the concepts and conditions, causes and effects, processes and relations of poverty have entered the LTVS project in Northern Tamil Nadu.

[81]See for elaboration Bardhan 1989; Breman et al 1997, Himanshu et al 2015, 2018

TABLE 1: POVERTY AND ITS CHARACTERISTICS 1973-2016.

District. (as administrative unit / revenue unit – 'underdeveloped')
Villages. Aggregate of three, ten or eleven villages; inter-village variation and poor villages; remoteness, land inequality, seasonal demand for labour and persistence of poverty
Class – capitalists, rich middle and small peasants, petty commodity production, expansion by multiplication; intermediate classes; *Labour*, landless labour, wage workers, landless peasants, proletariat, direct producers, casual female labour, (male and female wage rates and (seasonal) earnings) – relation to land); jobs; informality, surplus labour, migration, remittances; 'poverty labour (firewood, cowdung work, gleaning, shitwork, begging).
Biosphere (soil fertility, pests, weeds)
Energy (human, animal, diesel electrical)
Water (access, pollution, drought)
Land (farm size distribution / tenure)
Commodity exchange, markets, marketing systems; informality, commercialisation, commodification, interlocked contracts; kind exchange
Money (informal) market institutions and terms and conditions / state controlled organisations (banks co-ops and subsidies); debt and credit and upwards and downwards mobility, collateral, missing loans for landless for land; gendered savings and divestment, capture.
Variability, risk and uncertainty and coping mechanisms and practices
Technology

Agricultural technology – with agriculture as a sector/production and post-harvest, adoption, de-adoption, non-adoption

- by crop – notably rice and groundnut but later many other crops
- labour requirement:tools, mechanisation (-)/ irrigation(+)

Post harvest technologies, marketing system, markets; value chains; supply chains; food systems

(Rural) non-farm economy; growth linkages from agriculture; growth centres, craft, service, trade, money-lending, transport, construction, leather, agro-processing, textiles, metal working, firms, workshops, petty production, self employment livelihoods.

technical or technological change applied to all these categories

distress as driver of entry to the nonfarm economy.

Income – groups/deciles – expenditure; consumption
Household – farm (small scale producers, peasants, cultivators, farmers) petty producers)/firm/family

intra-household (gendered and generational) control over assets , income, decisions and expenditure (especially food expenditure)

household composition- dependents, female headed, all female, individuated, female individuated (widows), collapsed.

Qualifiers / later dimensions of poverty

Water-poverty (energy-poverty)

Relative ((Lack of) capacity to emulate, aspiration to consume)
Social status (caste and expenditures)
'Simultaneous deprivations'.
Simultaneous exclusion from multiple interventions.

Human development poverty/ capabilities (lack),

Life chances (gendered), Nutritional poverty (Alcohol here), Medical poverty / incapacity from work/sickness, mental ill health, disability; Educational poverty; Freedom; feedback relations. Deprivations /absence of right to be dependent / social expulsion (cross-caste elopement, disease, mental illness, addiction, crime, abandonment/desertion etc) qualifications for social security (maternity, unemployment, sickness, accident, delay to marriage age, breadwinner death, disability, old age) ineligible inclusion, eligible exclusion
Transient (short term) and chronic (long term). Quality of adult care.

Identity

Caste (ethnicity religion) social discrimination, humiliation, occupational segmentation, lack of options for mobility
Gender (relative latecomer but studied from infancy). Female households/wages/lack of education, lack of opportunity in nfe / loss of dependent status.
Ideological reinforcement, punitive expectations, cognitive and verbal constraints

State; policy; bureaucratics; politics of agenda-procedure-resource mobilisation-allocation and access; the government
Stagnation of agl R and D and infrastructural expenditure and subsidies.
Loans for SC landless for land; orphanages especially for abandoned girls.
Public services affecting private poverty (sanitation, drinking water, electricity, roads, education, health, food and nutrition)
Social protection
Pauperising access to the state (delays, bribes, transactions costs, party politicisation), conditions of work and motivation of officials.
Pauperising capture/ simultaneous exclusion from multiple interventions.

Public engagement with policy

Disappearance - migration and exit of poor out of analytical frames – and of not-poor (no panel studies). *Neglect;* pastoral / livestock economy; army and skills

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Yet despite working at multiple scales, the project has been *selective* in its handling of poverty. This due to the fact that - as Da Corta and Venkateshwarlu argued in 1999 - theory drives methods which drive results. With respect to poverty, theory has not always been appropriate to the village and household scale of analysis. VLS are an assertion of the uniqueness of space, time and society, and are not suitable for testing

theories based on assumptions which deny such uniqueness and/or are based on universalist assumptions about motivation. While the categories of theory and history have both changed over time, methods such as ethnography that are inappropriate for hypothetical deductive theory have led to the development of inductive theory (as in the case of inter-village variation (Chambers and Harriss 1977, JHarriss 1991, Srinivasan 2004)).

Theoretical pluralist approaches and constant re-framing[82] have required a wide range of multi-sited and multi-scaled practical research methods around a common core involving village censuses, stratified random sample surveys, case studies and ethnography. Rigorously replicated resurveys of whole villages were not undertaken. They do not seem to be possible. Panel research was jettisoned as impractical and sample surveys used differently justified sampling methods. Both researchers and the researched change, and, through both contact and reflection, they also change each other (Harriss-White and Harriss 2007). Each round provoked novel sets of questions emerging directly from contemporary historical developments, some predicted from earlier rounds but others not. For poverty, the statics are comparative only to a very limited extent, confined in a reductionist way to the agrarian part of the economy through crude categories of land ownership.[83]Even then, rigorous comparison isn't possible if research methods are individualist. The most robust comparative possibilities have emerged through political economy: there is something 'out there' which is not an ethno-particularistic construct or a product of an individualised and relativistic interpretation. Even so the evidence has generated robust debates in political economy.[84]

Uncertainty and surprise have been routine in fieldwork-based reconsiderations of what *is* relevant and what *ought to be* relevant. For example in the first round of the VLS, research on water management, water table decline and on seasonality, plus the decade-long investigation into the introduction of inappropriate rice milling technology; in the second round, the work on local level revenue and expenditure, and on alcohol consumption as a nutrition and poverty problem; in the third round, the

[82]Common in VLS, see Himanshu et al. 2015.

[83]Generalised in Harriss 1992 where a review of village level evidence for poverty in India involved review, comparison and conceptual aggregation of hundreds of unique studies of aspects of poverty. The study of the small village of Palanpur in Uttar Pradesh has been more consistent, perhaps because it has been organised by the same team with questions about structural transformation, growth and village inequality throughout appropriate for analysis using techniques of development economics (Himanshu et al 2018).

[84] Among others, over the attributes and theoretical status of capitalist agriculture, petty production and disguised wage labour, the process of differentiation, debt bondage and freedom in wage labour, non-farm economy and de-agrarianisation.

research on pauperising disability and incapacity, on newly emerging excess female child mortality and gender bias in nutrition, on emerging water markets and pauperising interlocked agrarian contracts, on sanitation as a development problem and on the increasingly caste-corporatist regulation of the local economy (see Harriss-White and Janakarajan, 2004). The certainty of all this indeterminacy has sat uncomfortably with mechanical resourcing procedures embodied in standard research proposal templates - and often with the resourcing itself. Yet empirical surprises and the re-appraisal of relevance have frequently led to the energising of rural development discourse and practice in the past as when Chambers first argued for rural development to put 'the last first' (1983).

Round six is certain to enrich understanding of villages in northern Tamil Nadu through its focus on new dimensions of poverty and technology and new ways of understanding their relations and trajectories.

REFERENCES

Agnihotri S. 2000, *Sex Ratio Patterns in the Indian Population: A Fresh Exploration*, New Delhi, Sage

Alagh Y. 2018, 'Planning the Agricultural Vision', *Indian Journal of Agricultural Economics* Vol 73 No 1 pp 1 – 16

Anderson, K. and A. Bows 2011, 'Beyond dangerous climate change: emission pathways for a new world', *Philosophical Transactions of the Royal Society A*, Vol 369, pp20-44

Arivukkarasi A. 2015, 'The Making and Unmaking of Handloom, Silk Weaving in the Arni Region', chapter 8 pp 201-228 in (ed) Harriss-White

Bardhan P. 1989, *Conversations Between Economists and Anthropologists: Methodological Issues in Measuring Economic Change in Rural India.* Oxford, Oxford University Press

Basile E. 2013, *Capitalist Development in India's Informal Economy*, Abingdon, Routledge

Basile E. 2015, 'The Impact of Caste on Production Relations in Arni', Chapter 6 pp 151-76 in (ed) Harriss-White

Basile E and B. Harriss-White 1999, 'Corporative Capitalism: Civil Society and the Politics of Accumulation in Small-town India', *QEH Working Paper 38*, Oxford University

Baud I., E. Basile, T. Kontinen and S. von Itter 2019, *Building Development Studies for the New Millennium,* Abingdon, Palgrave

Bhaduri A. 1983, *The Economic Structure of Backward Agriculture*, London, Academic Press

Binswanger H. 1986, 'Agricultural mechanisation: a comparative historical perspective', *The World Bank Research Observer*, Vol. 1, No. 1, pp. 27-56

Breman J., P. Kloos and A. Saith (eds) 1997, *The Village in Asia Revisited* New Delhi, OUP

Broehl N. 1973, 'The fertiliser distributor as change agent', *Economic and Political Weekly*, Vol 8 No 52 pp A157-163

Brown L. 1970, *Seeds of Change: The Green Revolution and Development in the 1970s*, London, Overseas Development Council

Cabral L. 2019 'Epic narratives on the Green Revolution: conceptual framing', IDS Sussex

Callon, M. 1998 "An Essay on Framing and Overflowing," pp. 244-69 in M. Callon (ed.)

Callon M. (ed.) 1998, *The Laws of the Markets*, Oxford, Blackwell

Cavalcante M. 2015, 'Feeling rich on an empty stomach: agrarian crisis and rural consumption choices', chapter 10 pp251-74 in (ed) Harriss-White

Chambers R. 1983, *Rural Development: Putting the Last First*, Harlow, Prentice Hall

Chambers R. 1991, 'Poverty in India: Concepts, research and reality', chapter 11 pp 301-332 in (eds) B. Harriss, S. Guhan and R. Cassen

Chambers R., B. N. Chinnappa, B. Harriss and B. Wickremanayaka 1977, 'Research Methodology', chapter 5 in (ed) Farmer

Chambers R. and J. Harriss 1977, 'Comparing 12 South Indian Villages: In Search of Practical Theory', chapter 20 pp 301-322 in (ed) Farmer

Chancel L. and T. Piketty 2015, 'Carbon and Inequality from Kyoto to Paris: Trends in the global inequality of carbon emissions (1998-2013) and prospects for an equitable adaptation fund', http://piketty.pse.ens.fr/files/ChancelPiketty2015.pdf 4 Global total household consumption emissions in 2007

Chandrasekhar C. 1993, 'Agrarian Change and Occupational Diversification: Non-Agricultural Employment and Rural development in West Bengal', *Journal of Peasant Studies*, Vol 20 No 2, pp205-270

Chinnappa N. 1977, 'Adoption of the new technology in North Arcot district', chapter 8 pp92-123 in (ed) Farmer

Choi B. and A. Pak 2006, 'Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services and policy', *Clinical Investigative Medicine*, Vol 29 No 6 pp351-364

Clay E. and B. Schaffer (eds) 1984, *Room for Manoeuvre : An Exploration of Public Policy*, London, Heinemann

Cleaver H. 1972 'The Contradictions of the Green Revolution', *American Economic Review*, Vol 62 No 12, pp 177-186

Colatei D. and B. Harriss-White 2004, 'Social stratification and Rural Households' Chapter 1-4 pp115-58 in Harriss-White and Janakarajan

Cornwall A. and I. Scoones (eds) 2011, *Revolutionising Development : Reflections on the Work of Robert Chambers*, Earthscan

Cowen M. and R. Shenton 1996, *Doctrines of Development,* London Routledge

Cullather N. 2010, T*he hungry world: America's cold war battle against poverty in Asia*. Harvard University Press, Massachusetts

Da Corta, L. and Venkateswarlu, D. 1999. 'Unfree Relations and the Feminisation of Agricultural Labour in Andhra Pradesh, 1970–95', *Journal of Peasant Studies*, Vol. 26, pp73–139

Devereux S. 1988, 'Entitlements, availability and famine: a revisionist account of Wollo , 1972-4', *Food Policy*, pp270-82

Dhas A, 2012, 'Rural Poverty and Agricultural Development in Tamil Nadu', *MPRA Paper No. 42347*, available at https://mpra.ub.uni-muenchen.de/42347/1/MPRA_paper_42347.pdf

Dietrich Wielenga K. 2019, 'The Emergence of the Informal Sector: Labour legislation and Politics in South India 1940-1960', *Modern Asian Studies*

Erb S. and B. Harriss-White 2002, *Outcast from social welfare: Adult disability in rural South India* Books for Change, Bangalore

Erb S. and Harriss-White 2004, 'Incapacity and Disability', Chapter 3-4 pp 349-73 in Harriss-White and Janakarajan

Farmer B.H. (ed) 1977a, *Green Revolution? Technology and Chainge in Rice growing Areas of Tamil Nadu and Sri Lanka,* London Macmillan

Farmer B. 1977 b, 'Technology and change in rice-growing areas', chapter 1 pp 1-7 in (ed) Farmer

Fernandez B. 2012, *Transformative policy: a new feminist framework for policy analysis in developing countries,* London, Ashgate

Ford Foundation and Ministry of Agriculture, Government of India 1959, *Report on India's food crisis & steps to meet it,* New Delhi, Ministry of Agriculture

Gathorne-Hardy A. 2013, 'On GHG emissions from rice', *RGTW Working Paper Number 5*, Area Studies, Oxford, available at: https://www.southasia.ox.ac.uk/sites/default/files/southasia/documents/media/ghg_emissions_from_rice_-_working_paper_2.pdf

Gathorne-Hardy A. 2015'Multidisciplinary life cycle assessment - a methodological outline', *RGTW Working Paper 4*, Area Studies, Oxford, available at: https://www.southasia.ox.ac.uk/sites/default/files/southasia/documents/media/mulidisciplinary_life_cycle_assessment_f_working_paper_4.pdf

Ghosh J. 1997, 'India's structural adjustment: an assessment in comparative Asian context', *Economic and Political Weekly*, Vol 32 No 21 pp 1113-31

Ghosh J. and C. Chandrasekhar 2013, India's Informal Economy, available at: https://www.researchgate.net/publication/315768576_India's_Informal_Economy

Gold L. and B. Harriss-White 2004, 'No end to the betrayal? Primary Education in its Social Context: Evidence from Rural Tamil Nadu', chapter3-6 in Harriss-White and Janakarajan

Gough K. 1977, 'The "Green Revolution" in South India and North Vietnam', *Social Scientist* Vol. 6, No. 1, pp. 48-64

Gough K. and H. Sharma 1973, *Imperialism and Revolution in South Asia*, New York, Monthly Review Press

Government of India 1993, *Report of The Expert Group on Estimation of Proportion and Number of Poor*, New Delhi, Planning Commission available at: http://planningcommission.nic.in/reports/publications/pub93_nopoors.pdf

Griffin K. 2000, 'Human Development: Origins, Evolution and Impact'. in *Studies in Development Strategy and Systemic Transformation*. London, Palgrave Macmillan

Guerin I. 2014, 'Juggling with Debt, Social Ties, and Values: The Everyday Use of Microcredit in Rural South India', *Current Anthropology* Vol. 55, No. S9, pp S 40-50

Guerin I., S. Morvant and M. Villareal (eds), *Microfinance, debt and overindebtedness. Juggling with money.* New Delhi, OUP

Guhan S. 1992 'Social security in India: Looking one step ahead', chapter 10 pp282-300 in (eds) Harriss, Guhan and Cassen

Guhan S. and S. Paul (eds) 1999, *Corruption in India: An Agenda for Action*, New Delhi, Vision.

Gupta, S., M. Musto and B Amini (eds) *Marx at 200* (tbc) New York, Palgrave-Macmillan

Harriss B. 1972, 'Innovation Adaption in Indian Agriculture: the High Yielding Varieties Programme', *Modern Asian Studies*, Vol. 6, pp. 71-98.

Harriss B. 1976a, 'Paddy Processing in India and Sri Lanka: A Review of the Case for Technological Innovation' *Tropical Science*, vol. 18, no. 3, pp. 161-186

Harriss B. 1976b, 'The Indian Ideology of Growth Centres', *Area* (IBG) Vol 8 No 4, pp 263-9

Harriss, B. 1979 'Going against the Grain' *Development and Change,* 10, 3, 368-84.

Harriss B. 1981, *Transitional Trade and Rural Development*, New Delhi, Vikas

Harriss B. 1987a, 'Regional Growth Linkages from Agriculture: a Critique', *Journal of Development Studies*, Vol 23, No 3, pp114 -128

Harriss B. 1987b, '1987 'Regional Growth Linkages from Agriculture and Resource Flows in the Non Farm Economy', *Economic and Political Weekly*, Vol 22, No 1-2, pp 31-46

Harriss B. 1991a 'The Arni studies: changes in the private sector of a market town, 1973-83', Chapter 9 pp181-213 in (eds) Hazell and Ramasamy

Harriss B. 1991b, *Child Nutrition and Poverty in South India,* Concept, New Delhi

Harriss B. 1992 'Poverty in India: Micro Level Evidence', pp335-391 in (eds) B. Harriss, S. Guhan and R. Cassen

Harriss B. , S. Guhan and R. Cassen (eds) 1992 *Poverty in India: Research and Policy*, New Delhi, OUP

Harriss B. and C. Kelly 1982, ''Food Processing: Policy for Rice and Oil Technology in South Asia' *Bulletin of the Institute of Development Studies*, Vol 13, No 3, pp32-44.

Harriss J. 1977 'Bias in perceptions of agrarian change', chapter 4 pp 30-37 in (ed) Farmer

Harriss J. 1982 *Capitalism and Peasant Farming,* Bombay, OUP

Harriss J. 1991 a, 'The Green Revolution in North Arcot: Economic trends, Household Mobility, and the Politics of an Awkward Class', chapter 4 in (eds) Hazell and Ramasamy

Harriss-J. 1991b, 'Population, Employment and Wages: A comparative study of North Arcot Villages, 1973-1983', chapter 6 in (eds) Hazell and Ramasamy

Harriss B. and J. Harriss 1984, ''Generative' or 'Parasitic' Urbanism? Some observations from the recent history of a South Indian Market Town', *Journal of Development Studies*, Vol 20, No 3, pp 82-100

Harriss-White B. 1996, 'Primary Accumulation, Corruption and Development Policy: some Insights from a South Indian case Study' *Review of Development and Social Change*, Vol 1, No 1, pp 85-101

Harriss-White B. 2002, 'Development, Policy and Agriculture in India in the1990s', *ODID Working Paper No. 78* available at: https://ideas.repec.org/p/qeh/qehwps/qehwps78.html

Harriss-White B. 2003, *India Working: Essays on Economy and Society*, Cambridge, Cambridge University Press

Harriss-White B. 2004a, 'Policy and the Agricultural Development Agenda', chapter 2-1 in Harriss-White and Janakarajan

Harriss-White B. 2004b, 'Labour, Gender Relations and the Rural Economy', chapter 1-5 pp 159-174 in Harriss-White and Janakarajan

Harriss-White B. 2004c, 'Socially Inclusive Social Security: Social Assistance in the Villages', Chapter 3-7 pp 429-446 in Harriss-White and Janakarajan

Harriss-White B. 2004d, 'Food, Nutrition and the state in Northern Tamil Nadu', chapter3-5, pp373-410 in Harriss-White and Janakarajan

Harriss-White B. 2005, 'Commercialisation, commodification and gender in post-harvest systems for rice in South Asia', *Economic and Political Weekly,* Vol XL No 25 pp 2530 -42

Harriss-White B. 2013, 'Credit, finance and contractual synchrony in a South Indian Market Town' pp 103-124 in (eds) I. Guerin, S. Morvant and M. Villareal

Harriss-White B. (ed) 2015 *Middle India and Urban-Rural Development: Four Decades of Change* new Delhi, Springer

Harriss-White B. 2015b, ''Local Capitalism' and the development of the rice economy , 1973-2010', chapter 4 pp97-131 in (ed) Harriss-White

Harriss-White B. 2015c, 'Epilogue – The Future for Small Towns', chapter 11 pp275-84 in (ed) Harriss-White

Harriss-White 2017, 'Rethinking institutions: innovation and institutional change in India's informal economy', *Modern Asian Studies* Vol 51. No 5, pp 1727-1755

Harriss-White B. 2018, 'Awkward classes and India's development', *Review of Political Economy, October Special Issue.* pp 1-22

Harriss-White B. and D. Colatei 2004, 'Rural Credit and the Collateral Question', Chapter 2-4, pp 252-83 in Harriss-White and Janakarajan

Harriss-White B. and J. Harriss 2007, Green Revolution And After: The 'North Arcot Papers' And LongTerm Studies Of The Political Economy Of Rural Development In South India, *QEH Working Paper 146*, available at:
https://www.qeh.ox.ac.uk/sites/www.odid.ox.ac.uk/files/www3_docs/qehwps146.pdf

Harriss-White B. and S. Janakarajan 1997, 'From Green Revolution to Rural Industrial Revolution', *Economic and Political Weekly*, Vol XXXII No 25 pp 1469- 77

Harriss-White B. and S. Janakarajan 2004, *Rural India facing the Twenty First Century*, London Anthem

Harriss-White B., S. Janakarajan and D. Colatei 2004a, 'Introduction: Heavy Agriculture and Light Industry in South Indian Villages', chapter 1-1 pp 3-58 in Harriss-White and Janakarajan

Harriss-White B. and A. Sinha 2007, *Trade Liberalisation and India's Informal Economy,* New Delhi , OUP

Hazell P. 1991 c, 'An analysis of the indirect effects of agricultural growth on the regional economy', chapter 8 pp153-80 in (eds) Hazell and Ramasamy

Hazell P. and C. Ramasamy (eds) 1991, *The Green Revolution reconsidered: The Impact of high Yielding Varieties in South India* , Baltimore, Johns Hopkins

Hazell P. C. Ramasamy, V. Rajagopalan, P Aiyaswamy and N Bliven 1991a, 'Economic Changes among village households', chapter 3 pp29-56 in (eds) Hazell and Ramasamy

Hazell P. , C. Ramasamy, V. Rajagopalan and N. Bliven 1991b 'A social accounting matrix of the regional economy (1982/3)', chapter 7 pp 127-52 in (eds) Hazell and Ramasamy

Himanshu, P. Jha, and G. Rodgers (eds) 2015, *Longitudinal Research in Village India: Methods and Findings*, New Delhi, OUP

Himanshu, P. Lanjouw and N. Stern 2018, *How Lives Change: Palanpur, India and Development Economics*, Oxford, OUP

Hodgson G. 2003, 'The hidden persuaders: institutions and individuals in economic theory', *Cambridge Journal of Economics*, Vol 27, No 2, pp159–175,

Hodgson G. 2006, 'What are institutions?', *Journal of Economic Issues*, Vol XL, No !, pp 1-26

Huws U. 2003, *The Making of the Cybertariat*, London, Merlin

International Labour Office (ILO) 2018, *Women and Men in the Informal Economy: a Statistical Picture*, Geneva ILO

Jairaj A. and B. Harriss-White 2006, 'Social structure, tax culture and the state: Tamil Nadu , India', *Economic and Political Weekly* Vol XLI No 51 pp 5247-57

Jan A. and B. Harriss-White, forthcoming, 'Petty 'Production and India's Development' in (eds) Gupta et al

Janakarajan S. 1992, 'Interlinked transactions and the market for water in the agrarian economy: a case study from Tamil Nadu', in (ed) S. Subramanian

Janakarajan S. 2004, 'Irrigation: the Development of an Agro-Ecological crisis' chapter 1-2 pp59-77 in Harriss-White and Janakarajan

Jayaraj D. 2004, 'Social institutions and the Structural Transformation of the Non0-Farm Economy', chapter 1-6 pp 175-91 in Harriss-White and Janakarajan

Johnstone B. and J. Cowrie 1968, 'The Seed-fertiliser revolution and the labour absorption problem', Food Research Institute, Stanford.

Jolly R. 1976, "The World Employment Conference: The Enthronement of Basic Needs". *Development Policy Review*. A9 no 2, pp31–44

Kakarlapudi K. 2010, 'Agricultural Growth Deceleration in India: A Review of Explanations', CDS Trivandrum, *MPRA Paper No. 35865*, available at https://mpra.ub.uni-muenchen.de/35865/1/agricultural_growth_deceleration_in_india.pdf

Kar D. 2010, *Drivers and dynamics of illicit financial flows from India: 1948-2008*, Washington, Global Financial Integrity

Kumar A. 2002, *The Black Economy in India,* New Delhi, Penguin India

Lang R. 1999, 'Empowerment and CBR? Issues raised by the South Indian experience', Chapter 9 pp130-148 in Stone, E. (ed.)

Latour B. 1999, 'On recalling ANT', *Sociological Review*, Vol 47, No 1 pp15-p25

Lawson T. 2003, 'Institutionalism: on the need to firm up Notions of Social Structure and the Human Subject', *Journal of Economic Issues,* Vol 37 No 1 pp 175-207

Lele U. 1971, *Foodgrain Marketing in India: Private performance and public policy*, Ithaca, Cornell University Press

Madduma Bandara C. 1977, 'Hydrological Consequences of Agrarian Change', Chapter 21 pp 323-339 in (ed) Farmer

Mani M., G. Mody, M. Sukumar and B. Harriss-White 2019, 'Provisioning Chennai: Labour in the Rice Supply Chain'. in (eds) A. Narayanamoorthy and V. Bhavani

Mann K. C. Moore and S. Johl 1968, 'Estimates of potential effects of new technology on agriculture in Punjab', *American Journal of Agricultural Economics*, Vol 50 pp 278-91

McDonough T., D Kotz and M. Reich (eds) 2017, *Social Structure of Accumulation Theory*, Cheltenham, Edward Elgar

Mellor J. 1976, *The New Economics of Growth: A Strategy for India and the Developing World,* Ithaca, Cornell University Press

Mohanty M. 2006, 'Challenges of Revolutionary Violence: The Naxalite Movement in Perspective', *Economic and Political Weekly*, Vol 41 No 29 pp 3163-68

Narain D. 1972 'Growth and Imbalances in Indian Agriculture', *Economic and Political Weekly* pp A-2 – 7

Narayanamoorthy A. and V. Bhavani (eds) 2019 *Agriculture and Rural India after the Economic Reforms* , New Delhi, Tulika Pub

Nillesen P. and B Harriss-White 2004, 'Life chances: development and female disadvantage', Chapter 3-3 pp 328-50 in Harriss-White and Janakarajan

Owen J. and L. Lloyd 2018, '*Costing Brexit: what is Whitehall spending on exiting the EU?*', London, Institute for Government

Pacey A. and P. Payne 1984, *Agricultural Development and Nutrition*, London, Hutchinson,

Pinstrup Andersen P. and M. Jaramillo 1991, 'The impact of technological change in rice production on food consumption and nutrition', chapter 5 pp85-104 in (eds) Hazell and Ramasamy

Ramachandran V. and M. Swaminathan (eds) 2002, *Agrarian Studies,* New Delhi, Tulika

Ramasamy C., P. Hazell and P. Aiyasamy 1991, 'North Arcot and the Green Revolution' chapter 1 PP 11 -29 in (eds) Hazell and Ramasamy

Rangasami A. 1985, ''Failure of Exchange Entitlements' Theory of Famine: A Response', *Economic and Political Weekly,* Vol. 20, No. 42, pp. 1797-1801

Rockstrom, J. et al., 2009, 'A safe operating space for humanity', *Nature* Vol 462, pp 472-5.

Roman C. 2008, *Learning and Innovation in Clusters: Case Studies from the Indian Silk Industry*, D Phil Thesis, Oxford University

Roman C. 2015, 'Technological Change and Innovation in Middle India: the case of Arni's Silk Cluster', chapter 7 pp177-200 in (ed) Harriss-White

Saith R. and B. Harriss-White 2004, 'Antipoverty policy: Targeting and Screening for Eligibility', chapter 3-2 pp308-323 in Harriss-White and Janakarajan

Sanyal K. 2013, *Rethinking Capitalist Development: Primitive Accumulation, Governmentality and Post-Colonial Capitalism*, London, Routledge

Schaffer B. 1984, 'Towards Responsibility: public policy in concept and practice ', pp 142-90 in (eds) E. Clay and B. Schaffer

Sen A.K. 1999, *Development as Freedom*, Oxford, Clarendon

Sen Ab. 2002, 'Agriculture, Employment and Poverty: Recent Trends in Rural India', pp392-444 in (eds) V. Ramachandran and M. Swaminathan

Sen S. 1967, 'Growth and Instability in Indian Agriculture', *Indian Journal of Agricultural Statistics,* Vol 19 pp 1-30

Sharma H. 1973, 'The Green Revolution in India: Prelude to a Red One?', in ((eds) K. Gough and H. Sharma

Sinha A. , K. Siddiqui and P. Munjal 2007 ' A SAM framework for the Indian Informal Economy', chapter 5 pp233-306 in (eds) B. Harriss-White and A. Sinha

Srinivas M. and A Shah 1960, 'The Myth of Self-Sufficiency Of the Indian Village', *Economic and Political Weekly* Vol 37 No 12 pp 1375-8

Srinivasan M.V. 2004, 'Time and Space: Intervillage Variation in the North Arcot Region and its Dynamics 1983-95', chapter 1-3 pp 78-114 in Harriss-White and Janakarajana

Srinivasan M. V. 2015, 'Arni's workforce: Segmentation processes, labour market mobility, self-employment and caste', chapter 3 pp65-96 in (ed) Harriss-White

Stanley J. 2015, 'A Future not so golden: Liberalisation, Mechanisation and Conflict in Arni's Gold Ornaments' Cluster', chapter 5 pp131-150 in (ed) Harriss-White

Stone, E. (ed.) 1999, *Disability and Development: Learning from action and research on disability in the majority world,* Leeds: The Disability Press.

Subramanian S. (ed) 1992, *Themes in Development Economics : Essays in Honour of MKalcolm Adiseshia*, New Delhi, OUP

Swaminathan M. 2009, 'Neo-Liberal Policy and Food Security in India: Impact on the Public Distribution System', available at: https://www.researchgate.net/profile/Madhura_Swaminathan/publication/253675949_Neo-Liberal_Policy_and_Food_Security_in_India_Impact_on_the_Public_Distribution_System/links/56b6277e08ae3c1b79ad2765/Neo-Liberal-Policy-and-Food-Security-in-India-Impact-on-the-Public-Distribution-System.pdf

Swaminathan M.S. 2017, *The Quest for a World without Hunger*, India World Scientific Pub

Tamil Nadu State Planning Commission 2007, *Human Development Report, Tamil Nadu*, Chennai TN Planning Commission

Taylor M. and Bhasme, S. (2018). 'The political ecology of rice intensification in south India: Putting SRI in its places', Journal of Agrarian Change Vol 19 no 1, pp3-20.

Tendulkar S. 1992, 'Economic growth and poverty', chapter 1 pp 27-57 in (eds) Harriss, Guhan and Cassen

Thorner A. 1982, 'Semi-feudalism or Capitalism? Contemporary debate on classes and modes of production', *Economic and Political Weekly,* Vol 17, pp 1961-8, 1993-99 and 2061-86

Trubek D. and M. Galanter 1974, 'Scholars in self-estrangement: some reflections on the crisis of law and development studies in the US', *Wisconsin Law Review,* pp1062-1102

Tumbe C. 2011, 'Remittances in India: Facts and Issues', *Working Paper 331*, Indian Institute of Management, Bangalore.

Vaidyanathan A. 1986, 'Labour Use in Rural India: a Study of Spatial and Temporal Variations', *Economic and Political Weekly*, Vol 21, No 52 ppA130-146

Visvanathan S. 2003, 'From the Green Revolution to the Evergreen Revolution : Studies in Discourse Analysis', available at: https://www.ids.ac.uk/files/SVCPGreenrev.pdf

Wanmali S. 1991, 'Changes in the Provision and Use of services in the North Arcot Region', chapter 10 pp213-37in (eds) Hazell and Ramasamy

Wolf, F. 2007, *Reproduction, Accumulation and the Division of Labour*; Paper for the Historical Materialism Conference, School of Oriental and African Studies, London University.

World Bank 2004, *Tamil Nadu Agricultural Development: Final Report* , New Delhi, World Bank