

Food and Agriculture: Trends in India into the early Twelfth Plan period

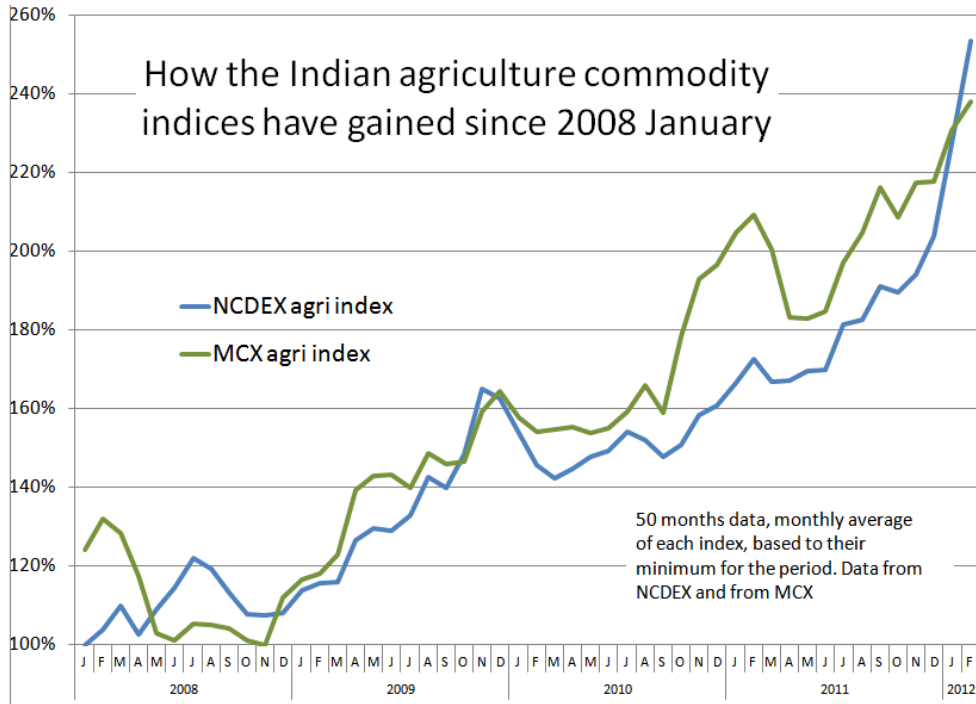
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The setting of the 2011-12 food production target at 250 million tons and the release of the Approach Paper to the Twelfth Plan (now complemented by the outputs, as each one is completed, of the working groups for agriculture, food and nutrition matters) have contributed to maintaining administrative and public focus on the size of India's agricultural output and the speed at which this is achieved¹. Underlying this emphasis is a widespread change in the nature of the determinants of agricultural produce and of the country's food and nutrition needs. This change has not been readily visible because it has in part been obscured by the concerns about rising food inflation, and the many protests and agitations about the costs of a basic basket of staple foods. Other factors concerning food and agriculture have also competed for the attention of the public and of the elected representatives: the protests over genetically modified and genetically engineered seeds, the continuing suicides by farmers, the debates over the National Food Security Bill, and the agitations against the diversion of agricultural land for non-agricultural uses.

Each of these are factors significant by themselves to alter future consumption patterns in both rural and urban India, and to influence the real retail prices that consumers pay for their food baskets. For both the public distribution system and for our food-based remedial welfare programmes (the mid-day meals and the integrated child development scheme, or ICDS), changes in the mix of foods available will affect nutritional balances, notwithstanding the recommendations contained in the various versions of the food security bill drafts and the current draft bill. When taken together, these factors are exerting new influences in all India's agro-ecological zones, with regional food baskets and nutritional balances coming under pressure from the change in the way a greater proportion of agricultural produce is converted to supply a fast-growing retail food sector.

During the course of the Eleventh Five Year Plan (2007-12) the salient features of the sweeping change being quietly implemented in India's agriculture and food structure became easier to distinguish. Many of these changes have been prefaced by the central government and its agencies pointing grimly to a farm sector that is under-performing in terms of its growth rate and which they emphasised is wanting for private sector investment. Although elsewhere in Asia, Africa and South America the relation between food commodity trading and speculation, and continued high local food prices has been a contentious subject, India from one Plan period to the next has decided to pursue a talismanic 4% per year growth rate, attaching to this objective the idea of 'inclusion'. The relationships between how capital is employed in the food and agriculture sector, what in fact happens to agricultural produce during its journey to urban shops, and the reasons for the steady rise of agri-commodity futures indices in India are still only irregularly researched² (see *Chart 1 and Table 1*). Profiting from speculation in food staples – and protecting the household from the effects of hoarding – is behaviour that is the

subject of legislation from 1955 when the Essential Commodities Act came into force, and also from 1980 with the Prevention of Black Marketing & Maintenance of Supply of Essential Commodities Act. The recent changes in agriculture and food however, employ many simultaneous mechanisms and methods, which legislation from an earlier era can only partly forestall.



How will the structures that govern food consumption and the systems that administer agriculture behave under the provisions of the Twelfth Plan? We find some indicators in the Approach Paper to the Plan. Among them is the matter of the diversion of agricultural land to non-cultivation uses, by which such land is either built upon for residential, commercial or industrial use, or goes fallow, by design or neglect, as a result of contagious urban sprawl which renders crop cultivation difficult and unremunerative. On this matter the Approach Paper has made the admission that over the past decade there has been a decline in net sown area of approximately 2 million hectares, although the document's authors have explained neither the causes for the decline, nor drawn a connection between this and the concurrent rapid pace of urbanisation in India. The Approach Paper has rather attempted to underplay the implications of this 2 million hectare decline by stating that this number is only 0.6 per cent of the total net sown area³.

To the contrary, demand for land is set to increase substantially with the near doubling of India's urban population and quadrupling of per capita urban incomes that we expect over the next 20 years. In a study that has often been cited by central ministries and industry alike, the McKinsey Global Institute estimated that an incremental 11 million hectares of land may be necessary to meet urban demand⁴. This is based on an estimate that demand for urban land in 2007 was 7.5 million hectares and would rise, under current patterns of land-use planning described as "poor and characteristic" or as "urban sprawl", to 18.6 million

hectares in 2030. This indicates a direct annual demand for land on which to build which may average, for the duration of the Twelfth Plan period (2012-17), about 0.5 million hectares annually. These estimates come out of a study of urban demand for land under municipal and city corporation systems of administration in which it is assumed that land records are available and transparent, and that transfers are both legal and in accordance with planning and zoning regulations. In practice, the land demand for a Tier 2 city with a current population of 1.5 million (for example Agra, Nashik, Patna, Salem or Varanasi) whose population may be expected to grow (for the 2011-2020 decade) by 20% will be shaped by the provision of new infrastructure - such as roads and highways, new townships around new industrial and service zones, and the accumulation of speculative land banks - which is likely to substantially raise the 0.5 million hectare/year estimate.

The connections between land use, urbanisation, the objectives of The Land Acquisition and Resettlement and Rehabilitation Bill, 2011, and the emerging structure of food and agriculture in India have also been dealt with in the Approach Paper (although with less studiousness than can be seen in Plans like the Eighth). It has said that agricultural productivity is currently half of what it is in many other countries and, that being the case, the solution for food productivity lies not in stopping diversion of agriculture land in all circumstances, but in increasing food production through higher land productivity. The methods that may deliver such 'higher land productivity' are discussed in more detail shortly. In defence of the broad 8%-9% per year growth rate desired for GDP for the duration of the Twelfth Plan period, the Approach Paper has stated that industrialisation, urbanisation and development generally will require a diversion of land to new uses. Thus has the Planning Commission of India tied the restructuring being experienced in the agriculture and food sectors - the changes to which have been visible since early in the Eleventh Five Year Plan (2007-12) - to the income opportunities and consumer habits of India's urban population, 350 million in the provisional estimate of the Census of India 2011, while placing in jeopardy the livelihoods of the bulk of rural cultivators - 83% of farmers operate holdings of less than two hectares in size, and the average holding size in India is only 1.33 hectares⁵. In so doing, the food choices that can be exercised by 830 million rural citizens are also being subjected to changes they have little control over.

Why will this unequal treatment persist, and even deepen, under the Twelfth Plan? A part of the answer is the insistence on the 4% annual growth of what is called the agriculture sector which will from April 2012 onwards become a feature for the fourth consecutive Five Year Plan. For now, the Planning Commission has expressed a conditional satisfaction that agricultural GDP growth has risen to average 3.7% during the period 2005-06 to 2010-11. Conditional because it has said that this acceleration has not been sufficient to prevent unacceptably high food inflation in a context of very volatile world prices and in the wake of a severe drought in 2009. Moreover, the Planning Commission has stated that although high food prices are clearly a set-back for inclusive growth, this has improved agriculture's terms of trade and prevented further fall in farm incomes relative to overall GDP⁶. On both matters - the expectation that recent agricultural GDP growth would dampen food inflation in the country, and that agriculture's terms of trade have benefited farm incomes - the Planning Commission is either

discounting the realities of cultivators and consumers (both rural and urban) or ignoring the true tale of incomes, actual costs of cultivation and the increasing impact of the industrialisation of crop cultivation and food flows in India. Where it exists, growth in agricultural GDP is closely related to the building of new infrastructure to store and move produce, and investment in the 'supply chains' that facilitate this movement, activities for which agricultural credit has also been used. This sort of growth does not affect the local terms of trade encountered by the smallholder, who is nevertheless faced with rising food inflation.

At the same time, what is being steadily encouraged is partnership between India's national agricultural research and extension system and the private sector. This encouragement has become far more visible in the last 24 months, a period notable for a series of events that display the increasing links between India's national agricultural research and extension system (NARS) and the commercial crop industry, both Indian and foreign. These links have been actively and vigorously facilitated, as if to a programme that exists outside annual plans and is extra-mural to the avuncular 'vision' documents so favoured by India's central ministries these days; to wit, both the Indian Council of Agricultural Research (ICAR) and the Ministry of Food Processing Industry have issued these. In May 2011 for example, the ICAR together with the Confederation of Indian Industry (CII) held an 'industry meet' in order to, as the official literature called it, "develop the required understanding and governance framework for developing partnerships that harness the collaborative synergies for value creation, value protection, value sharing and value recovery; and explore opportunities for income and job creation along the value chain"⁷. ICAR duly followed suit with its director general enumerating an array of what it has described as potential technologies developed by its institutes, "for commercialisation which included supportive farm machineries, nutraceuticals, value added food products, diagnostics and immunologicals". At the industry meet, ICAR assured corporations that it is persistently pursuing issues concerned with intellectual property rights (IPR) and technology commercialisation (no doubt to profit from its 58 patent applications), and is working towards developing "functional entrepreneurships, joint overseas initiatives and joint working groups in collaborative mode".

The impetus for such collaboration appears to have been provided by the run-up to the Twelfth Plan document, a process that has gathered a variety of consultations directly fostered by the Planning Commission, but which has also been accompanied by related consultations such as the one on foreign direct investment in retail, a subject which evoked wide response, from small traders and activists to multinational food corporations and representatives of foreign business chambers. Such collaboration may also have some of its roots in the document which did much to popularise the 'faster and more inclusive growth' slogan that is today ubiquitous in government - the Mid-Term Assessment of the Eleventh Five Year Plan. This collaboration has not however come about as the outcome of industry demands taking their cue from a new and more 'liberal' food and agriculture central doctrine. It has also been impelled by factors whose predominance now is the clearest signal of the significant shift in the thinking of government and its agencies. These factors are not readily visible as powerful agents of the change we are seeing in the structure of food and agriculture in India

and therefore deserve further study and integration into discussions on food and agriculture in India.

1. Foreign direct investment in multi-brand retail and the influence of the retail food industry.

In the final year of the Twelfth Plan (2016-17) the food processing industry is, according to an estimate provided by the Associated Chambers of Commerce and Industry of India (Assocham), expected to reach a size of Rs 1,037,211 crore based on an annual growth rate which is stated to be over 9% per year. This industry association view - one which is in terms of direction and policy requirements shared by the Confederation of Indian Industry (CII) and by the Federation of Indian Chambers of Commerce and Industry (FICCI) - is that foreign direct investment in multi-brand retail is critical to sustain such growth. "Adopting new technologies and improving productivity to become globally competitive," is the direction provided by Assocham, which at the same time has described the Indian food processing industry as now witnessing rapid growth in the domestic market⁸. This apparent contradiction in definition is quickly untangled by the campaign to allow FDI in the multi-brand retail sector - food multinationals specifically mentioned by industry associations in the contexts of both FDI and food processing industry growth are Wal-Mart, Pepsi, Cargill, Heinz, Kelloggs and ConAgra, all of which have products, investments, partners and long-term plans in and for India.

While the debate over permitting FDI in multi-brand retail was under way in the country, the central government and the private sector food industry consulted with each other often. One such consultation took place in March 2011. Representing the food and agri-business industry was a group from CII⁹. The aims of this CII group were to table before the minister a set of recommendations, and these have as much to do with the government's insistence on an agricultural GDP growth rate of 4% per year as they have to do with the enormous demand for food that will be placed by urban populations that have nationally grown (in the 2011-2011 decade) at 19.62% faster than rural populations¹⁰.

The CII group's recommendations were few, but these few were comprehensive enough to guide, as and when accepted by the central government, the change in the structure of food and agriculture in India for a period that extends far beyond the Twelfth Plan¹¹. To summarise, what this industry confederation wanted is: including processed food products in the definition of agriculture so that they get the same benefits as fresh produce; including all lending to the food processing industry as priority sector lending, without caps and with no limit on the size of investment in plant and machinery; removing entirely the goods and service tax (GST) on food processing (claimed as a factor contributing to food inflation); exempting perishables - that is, vegetables and fruit, from the Agricultural Produce Marketing Committee (APMC) Act which will allow food processing industries to buy directly from growers/cultivators (claimed as a factor contributing to post-harvest waste)¹².

Given the audaciously ambitious set of recommendations made by the CII, the insistence by the central government on attaining and maintaining a 4% per year agricultural GDP growth rate takes on an extremely worrisome complexion. By seeking to place a processed food product and a cultivated crop on the same plane to compete for benefits, industry has revealed that it discounts entirely the cost of cultivation risks borne by a cultivating household and also that industry is now emboldened enough to ask for public monies to automatically support the investor in the agriculture and food sector. Where the recommendation on lending is concerned, industry has decided to redefine, nothing less, what 'priority sector' ought to mean from now on, an attempt that in fact goes a few steps ahead of the direction that credit to agriculture has been observed to be taking for the last five years, which is, a greater percentage of such credit is urban in nature¹³.

Read together with the boilerplate assertions made by food and agriculture-related central ministries and departments for at least the last two Plan periods, these industry demands add detail to the picture of restructuring we are seeing in Indian agriculture. Central government has time and again mentioned that basic infrastructure in rural areas for storage and marketing of produce needs to be set up to link producers with regularly functioning markets. It has said that warehouses which provide 'value added services' (an expression equally favoured by investors) for the farming community should be encouraged. Under the rubric of encouraging financial inclusion, government has also repeated often that banks and other financial institutions in villages and blocks need to provide finance to entrepreneurs in agriculture, to extend credit to the setting up of processing units.

The effects of this programme, which has although running in fits and starts formed a background to the slow transformation of India's agri-produce and food markets, can be seen in the growth in the number of units classified under 'food products' in the Annual Survey of Industries 2009-10. Among the classifications under which all surveyed units are grouped, the highest number of factories is observed in 'food products', which accounts for about 16.5% of the total factories (which is 158,877 for 2009-10)¹⁴. The next most populated categories trail 'food products' by a considerable margin - 'other non-metallic mineral products' with 11% of the total and 'textiles' with 8.4%. As the largest sectoral grouping, the 'food products' sector also provides the highest employment (12.5% of the total).

The Survey highlights will crudely strengthen the hands of the industry associations (CII et al) which will point to the contribution to total GDP by the sector and the total employment created (ignoring the conditions of such employment). Their assertions are already reinforcing the rhetoric that 'reform' of our agricultural systems and channels helps deliver development gains, and that such reform has as its central guidance the welfare of the farming household and agrarian communities. In fact, when read with industry prescriptions for India's food and agriculture, these assertions ensure that any and all resulting policy will, in the name of the 'kisan', advance the industrial cultivation, food retail and urban-centric programme.

2. Climate change and the silver bullet of genetic engineering.

The view of this factor from the position of the multilateral lending agency is promising. Recognition that a current set of crop staples will deliver reducing per hectare yields (or readily lend themselves to being modified towards adaptation) is a first step, thereafter comes reform of agricultural policies in developing countries to make agricultural production more 'climate-friendly'. This is followed by institution-building in developing countries to provide them better options to improve their adaptive capacity. These essential steps require financial resources, and it is recommended that these be reallocated from direct farm income support toward better agricultural education, research, and technological development – that doing so will assist improvements in crop yield stabilise output under changing climate and market conditions. Finally, improved infrastructure is needed for appropriate storage, transportation facilities, and better weather forecasting and climate impact research. This is the prescription provided, in developing regions of the world and especially those which have experienced climate-related calamities, by the World Bank, the Asian Development Bank, the Inter-American Bank for Development and the African Development Bank.

While vast in scope and inter-generational in vision, there is also an energy aspect to this prescription. In May 2011, the International Energy Agency reported that CO₂ emissions reached a record high in 2010, and that 80% of projected 2020 emissions from the power sector are already 'locked in', as they will come from power plants that are currently in place or under construction today¹⁵. This prognosis, together with similar forecasts from major international agencies, organisations and scientific bodies - a familiar series usually dating back to the Fourth Assessment of the Intergovernmental Panel on Climate Change (IPCC) in 2008 - has been held up by the agbiotech, seed and industrial agriculture corporations as overwhelming evidence of the need to find new 'solutions' for a sector that contributes a generally large percentage of a country's CO₂ emissions, 'solutions' which will (a) lower the GHG emissions from agriculture (crop cultivation and livestock) and (b) lead to 'smart' crops bred to provide high yields even in a changing climate.

The prospect of reduced production of crop staples in South Asia (as also in South-East Asia, sub-Saharan and East Africa and in South and Central America) has galvanised both private sector crop science and the Consultative Group on International Agricultural Research (CGIAR) system together with its many partners in developing countries. This well-distributed and well-connected network of researchers (there are now two generations) has become adept in advancing the thesis that staple crops must be 'climate proofed' and that it is only the most current crop science technologies based on genetic manipulation that can ensure such 'climate proofing'. For the last two years, not a month has passed without at least one study acclaimed as authoritative describing how climate change could threaten food production and how specific adaptation strategies are best suited to neutralise or at least significantly lessen the impacts of climate change on crop staples.

The arguments are put forth by teams typically referred to as "world's leading climate and agricultural researchers", who work collaboratively for a good reason - the climate scientists rely on identifications of crop vulnerability to climate change as convincing evidence for the immediate relevance of their subject, and the agriculture researchers rely on climate-related crop failures (or the destruction caused by 'extreme' climate events) to support the urgency of their 'climate proofing' techniques. It is a scientific symbiosis, but not one which automatically has either smallholder cultivators and sharecroppers, nor food insecure households, as their primary clients.

The effects of climate change are thereby presented as a major threat to food security (which they no doubt are; it is often indigenous observations of impacts and the ability of local agro-ecological methods to respond that are excluded from such presentations), and research on shifts in the production of rice and maize in the northern hemisphere and what are now routinely called "climate-induced changes in crop productivity" is attracting both funding and candidates¹⁶. For this new field, there is no shortage of evidence - global temperatures rise and alterations in precipitation patterns among them. This is why "adaptation" of agricultural systems, adaptation of crop staples (particularly cereals and commercial crops) and the concomitant "adaptation" by cultivating communities have all become highly active and visible areas of research. It is a mounting concern that agriculture's carbon footprint, and the sector's contribution to greenhouse gases (particularly from livestock and poultry) are seen as problems of science - not of economic or development choices - and requiring technical and scientific solutions.

The international agricultural and crop science community fostered by the CGIAR has collectively held up what they have called two priority actions to address the challenges from climate change: (a) strengthening agricultural research particularly in the crop staples of Asia and Africa; and (b) increasing the amount, appropriateness, and accessibility of spatial data¹⁷. These have already become areas in which public-private partnerships (PPP) are common, and the reduction in public sector agricultural research is being quickly made up by private sector foundations, from India and abroad, which are quietly inheriting, invisible from public view, the institutional infrastructure and human resource pools of India's national agricultural research system (NARS), which is the largest in the world.

This transition is taking place with the connivance of the ICAR and its collaborators, with remarkably little public discussion. A scientific cover is provided by the new National Initiative on Climate Resilient Agriculture (NICRA) which the ICAR has called a network project and which was launched in February 2011¹⁸. The aim of the NICRA project is to "enhance resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration". While the research is to covers crops, livestock, fisheries and natural resource management, it is the desired outcomes that indicate why this particular disguise has been adopted, for among them are "rapid and large scale screening of crop germplasm including wild relatives for drought and heat tolerance through phenomics platforms for quick identification of promising lines and early development and release of heat/drought tolerant

varieties", "comprehensive field evaluation of new and emerging approaches of paddy cultivation like aerobic rice and SRI for their contribution to reduce the GHG emissions and water saving" (this is to be read with the focus on eastern Indian states for the so-called Second Green Revolution), and "special attention to livestock and fishery sectors including aquaculture which have not received enough attention in climate change research in the past; in particular, the documentation of adaptive traits in indigenous breeds is the most useful step".

The setting up of NICRA has come at a time when the Indian biotech industry – with its foreign partners and research collaborators – has decided to sustain a powerful campaign in favour of genetically modified (GM) seed, organisms and produce. Through the latter half of 2011 the crop biotech industry, working via the Association of Biotechnology Led Enterprises-Agriculture Group (ABLE-AG, which is a consortium of about 12 crop companies including Advanta, Bayer, Syngenta, BASF, Monsanto and Metahelix), the industry ran several series of media campaigns in regional languages and English to win public support for its cause. This effort had two motives, one of which was to attempt to counter the growing criticism and protests against GM seed and crops in India, which led to rallies and public meetings in many cities, and the other was to influence the passing of the Biotechnology Regulatory Authority of India (BRAI) Bill, which aims to grant a single-window clearance to genetically modified crops (roughly following the clearance model adopted from 2010 by the US Department of Agriculture)¹⁹. The Bill provides for the BRAI to take all decisions on the research, manufacture and use of organisms and products created through biotechnology.

3. The combining of agriculture, health and nutrition

The background against which the Prime Minister's National Council on India's Nutrition Challenges was formed in 2008 has not changed (it has representation from more than a dozen ministries and its key recommendations include the creation of new institutional arrangements that are supposed to encourage different sectors to work together). Yet, like seed, whose public legacy in India of use, distribution, breeding and exchange is being reshaped and redirected to conform to the Green Revolution 2 model, so it is with nutrition.

Now, like seed, it is agricultural biotechnology and privately directed crop research that determine cultivation options and food outcomes, and through them determine the nutritional choices and mix that urban households take decisions about every day. This trend is supported by legislation which on the one hand (as the Biotechnology Regulatory Authority of India, BRAI, does) destroys the idea and practice of traditional cultivators' cooperation on breeding, and on the other is converting India's national agricultural research system (NARS) into a science and technology provider that will ensure what the central government now calls demand-driven agriculture, and which is designed to encourage the depopulation of Indian agriculture and by so doing steadily erode the cultural and agro-ecological underpinnings of our traditional household food baskets and their nutritional diversity.

Hence it is that the concerned central ministries – Ministry of Agriculture, Ministry of Food Processing Industries, Ministry of Commerce – have during much of the Eleventh Plan period laid the foundation for this transformation. They have, with the aid of the Indian Council of Agricultural Research, adopted the public relations sloganeering of the international agricultural research consortia that work closely with food and crop multinationals and which drive research agendas along the lines required by the global food and retail industry.

Thus it is that in India, these ministries and their supporters (in industry and also in allied ancillaries) repeat a mendacious manifesto of food conversion: that Indians suffer from ‘hidden hunger’ or micronutrient malnutrition; that they do not get enough micronutrients required to lead healthy productive lives from the foods that they eat; that the diets of our poor usually consist of very high amounts of staple foods (cereals and pulses) but few micronutrient-rich foods such as fruits, vegetables, and animal and fish products; and finally that that biofortified foods which have been bred to have higher amounts of micronutrients can provide these needed vitamins and minerals. (Biofortification is a process of breeding higher levels of micronutrients - especially zinc, iron, and vitamin A- directly into key staple foods using either conventional breeding methods or biotechnology.)

Although the multiplicity of programmes, schemes and missions in the agriculture sector made it difficult to assess how well any was doing (there were 124 until about two years ago), their consolidation under a few centralised directorates has not made them any the easier to decode. The Rashtriya Krishi Vikas Yojana (RKVY), the national flagship programme under which the bulk of agricultural research is now being implemented (as it will be until 2017), will be exploited to advance in the states the message that nutrition and health gaps can be bridged through new agricultural practices. This is already the argument developed by the International Food Policy Research Institute (IFPRI, the policy advocacy and analysis centre of the Consultative Group on International Agricultural Research, the CGIAR) in India²⁰. In fact, the RKVY matrix of sectors, years and states show that specific thrusts have been provided at key moments during the last three years to recipient states – with no explanation available either from the central Ministry of Agriculture or the Departments of Agriculture of the receiving states as to the rationale for such interventions²¹(*see Table 2*).

Thus the conditions have carefully been created for the introduction of the idea that biofortification of staple crops in India must accelerate and be intensified. The realisation of the claimed potential of biofortified crops is now one of the core subjects in the Ministries of Agriculture, of Food Processing Industries and within the NARS. Hence the orchestrated exhortations from India’s food industry and its collaborators, the Indian administration and its NARS – that India must prioritise research investment (this means public research assets which will henceforth be harnessed to private sector agendas because of their funding) to step up the development of technologies and effective supply chains to increase the production and consumption of these nutrient-rich foods.

When the ‘public’ component of that investment does not materialise – as has been the case during the Tenth and Eleventh Plan periods – then the PPP merchants will

strengthen their claim to both determining the course of the 'nutrition challenge' in India and simultaneously promise the delivery of the hunger-busting package of technologies. We are already seeing the reach of new actors in the food and nutrition policy sphere. One such is the Britannia Nutrition Foundation²², which has partnerships with: the influential Global Alliance for Improved Nutrition (GAIN)²³, the Clinton Global Initiative, the World Bank Institute, the UN World Food Programme and the Naandi Foundation (Hyderabad-based, which is already engaged in centralised kitchens that provide mid-day meals, and whose 'Hungama Report' on child malnutrition was released in January 2012 by prime minister Manmohan Singh)²⁴.

Without even a broad-brush assessment of the RKVY programme since 2007-08 – let alone detailed inquiry into the benefits at district level of the Comprehensive District Agricultural Development Plans that are meant to be the goal-setting platforms for the massive programme – there are new demands being made of the RKVY framework. Enunciated by the IFPRI and subscribed to by planners and agricultural economists, these calls for a minimum of 15% of all RKVY and National Horticulture Mission (NHM) funds to be channelled towards the 'agriculture for health and nutrition' package of technologies²⁵.

With state Departments of Agriculture being pressurised to fall into line, with extension systems being revived but under corporate banners and with new PPP-led funding, state governments are being told that they must integrate nutrition security concerns into their planning, implementation, and monitoring. The ICAR network of research institutions, supported by the Department of Agricultural Research and Education and a raft of new 'agripreneur' schemes, is strenuously advocating that RKVY, NHM, and other platforms "create nutrition-sensitive value chains".

4. US domination of the crop science, research agenda and market reform process

The collaboration between India's NARS and institutes in the USA now has a history which is about 60 years old Today USAID, an agency that is at the forefront of directing the food aid that the USA distributes to countries in developing regions, views this partnership as being able to extend the "benefits" of a long-unfinished Green Revolution agenda, and to then harness the new determinants of an old partnership to co-export Green Revolution 2 to other countries, most notably in sub-Saharan and east Africa. India's suitability to doing so is explained by USAID citing an Indian "history of using agricultural innovations to address persistent challenges"²⁶.

The diversity of India's agro-climatic conditions, the volume of agricultural trade, the level of biotechnology development and adoption in India, and its information and communication technologies (ICT) programmes are seen as particularly advantageous for US food-related foreign policy and commercial control of the food sector. The value of India's NARS and of the growing private sector activity in agriculture and food technology research may not be readily visible in Indo-US bilateral discussions and assessments, but it is clear from a combined reading of

the US Department of Agriculture and the US Department of Commerce approaches to the agriculture and food sector in India. From the US point of view, the cooperation is to build up two areas: 1) developing what USAID has called “a reliable supply of food and sustainable farming systems in India”; and 2) “leveraging unique Indian capabilities to collaborate with U.S. and other international partners to solve global food security problems”.

This is the strategic background for the Indo-US Agricultural Dialogue²⁷, to be provided through what the US government calls the Agriculture and Food Security Program (AFSP). This programme is described as supporting the Government of India’s agriculture and food security goals, to which the transfer (from the USA to India) of “agricultural technologies and innovations” are marked as vital. In the USAID view, the AFSP will function through three projects, each of which contributes to transforming the land use and cultivation practices in India’s farms, serves primarily the needs of industrial agriculture and the retail and processed food sectors, ensures continuing human resource development which will take forward agri-research programmes that are designed for the market and for the corporate food system, turn the agricultural extension system into a delivery machine for inputs and technological interventions to be supplied by a NARS which will in turn have become a vast R&D shop for a South and South-East Asian and African food market, focusing genetic engineering and biotechnologies on the cereal and legume staples by aligning seed and crop development with the models being pursued by the CGIAR under its newly adopted Global Challenge Programmes, and which are the primary focus of the CGIAR Fund donors, which include private foundations.

These three projects are the Food, Agriculture and Rural Markets Systems (FARMS) project, the Agricultural Education and Innovation Systems Project (AEISP), and the on-going Cereal Systems Initiative for South Asia (CSISA) which is led by the International Rice Research Institute (IRRI)²⁸. Although the USAID continues to couch the contours of this partnership in terms generally favouring the Government of India’s food and agriculture objectives, the activity in the field indicates the new directions this partnership has already begun to take. In his Budget speech to present the 2011-12 Union Budget, Finance Minister Pranab Mukherjee had announced a Rs 400-crore package for extending the Second Green Revolution to the eastern states, which are large growers of rice. This package targets the rice-based cropping systems in Assam, West Bengal, Orissa, Bihar, Jharkhand, eastern Uttar Pradesh and Chhattisgarh.

Already, at the end of the kharif season 2011, Syngenta India, a subsidiary of Switzerland-based Syngenta AG, launched a project whose aim is the education of farmers in these states on better farm practices related to the rice crop. Syngenta’s three-year long project is titled, ‘Green Revolution in Eastern States (GRES)’²⁹. Syngenta’s project partners are the Government of India’s Department of Agriculture and Cooperation, West Bengal’s Agriculture Department and CropLife India, which is part of a global federation representing the plant sciences industry and which includes US agri-biotech conglomerates such as Dupont, Monsanto and Dow Agro Sciences.

The FARMS sub-programme of the Indo-US Agricultural Dialogue has already shown the route that this partnership prefers – the exit of the central and state governments from agricultural extension, and the conversion of corporatised rural agricultural distribution and communication networks to aid the partnership’s agenda. USAID now works with both ITC Limited’s e-Choupal to, as it has explained, “build demand for health products and services”. Under the claim of strengthening food security in India, USAID has also begun working with both ITC and Hariyali Kisaan Bazaar - the agricultural supermarket chain - to set up rural business hubs (a much older programme by the same name under the Ministry of Panchayati Raj has thus been appropriated). These so-called rural business hubs are intended to be the point-of-sale and point-of-conversion outlets which provide private sector agricultural extension services to farmers; indeed USAID has said they already reach over 190,000 farmers³⁰. For its part, USAID has been openly insistent on what it calls its “basic principles” that it sees as applicable to the Indo-US Agricultural Dialogue: the need to make reforms that open up the agriculture sector to private investment, and to private companies that can help manage the supply chains, reduce post-harvest losses (i.e. divert biomass from field use to biofuels and other industrial uses), and to turn farmers into recipients of “appropriate inputs” while also using the new agricultural distribution and communication networks to sell insurance and other service products³¹.

5. Pro-technology policies and consumption geared for urbanising India

The explanation from industry for the Government of India allowing foreign direct investment in the multi-brand retail sector follows two strands:

(1) The food processing industry was primarily driven by exports earlier and is now seeing rapid growth in the domestic market. Industry associations prefer citing what they call “key growth drivers” which include increasing urbanisation, changing lifestyles, more working women in the workforce and increasing nutritional needs.

(2) The industry needs to adopt new technologies and improve productivity to become globally competitive. Already growing at over 9% per year, the Rs 545,000 crore food processing industry is estimated by Assocham to reach the level of Rs 873,000 crore in 2014-15³².

The industry expects that changes in the nutritional sources and their proportions, for urban populations, will continue to spur this rate of growth. Of the overall food industry worth Rs 1,125,000 crore, an estimated 51% is unprocessed and primary processed and of the balance (the Rs 545,000 crore segment), 68% is commodity based and 32% is made up of ‘value-added’ products. Industry reminds government and finance regularly that the food processing sector contributes 9% to the GDP and accounts for 14% of total industrial output.

It is the immense scale of demographic movement in the country that is responsible for these contributions, this output and the size of the food processing industry. The increase, from 2001, in the urban population was from 286.1 million to 377.1 million; there has been rapid addition to the already large group of towns in India, from 5,161 in 2001 to 7,935 in 2011 - an astonishing rate which has

meant the transformation, at the rough rate of five a week for 10 years running, of 2,774 settlements into towns, however loosely the term 'town' is used³³.

Less impressive numerically but very significant economically is the increase, in the last 10 years, of the number of urban agglomerations. For the Census, an urban agglomeration is a continuous urban spread comprising one or more towns and their adjoining outgrowths. These have increased in number from 384 in 2001 to 475 in 2011 and are 91 chaotic, new, barely-municipal reminders that the flow of people from rural *tehsils* to urban wards has swelled in the last decade. The central government sees much good in this transformation (not just for the food retail and agri-business sector) and foregrounds the economic benefits of this change by employing a one-way lens. "It is well known," said the Approach Paper to the Twelfth Five Year Plan, "that agglomeration and densification of economic activities (and habitations) in urban conglomerations stimulates economic efficiencies and provides more opportunities for earning livelihoods. Possibilities for entrepreneurship and employment increase when urban concentration takes place, in contrast to the dispersed and less diverse economic possibilities in rural areas."

The feeding of the populations of 7,935 towns and 475 urban agglomerations will, in the calculations of the food and agri-business industry, ensure that its growth rate will be better than that of the GDP growth rate, and will be far above that of the agricultural sector growth rate (estimated at 3.5% to 4% for 2012-17). These projections depend heavily on the fulfilment of conditions required for the green revolution 2.0 envisaged by the crop biotech industry, in which 'better seeds' and more sophisticated agronomy play key roles. By this is meant GM seeds and farming practices that micro-regulate every day and step of the cultivator's actions. The equation uses current crop production as being 100%, estimates that these methods must work on 5% less land (a not unreasonable estimate given urban expansion and rural land use change), estimates gains of 20% from "reduced losses", further gains of 50% from "better farm practices", and an additional big jump of 80% in gains thanks to the adoption of plant breeding and biotechnology, all of which, they promise, will raise production two-and-a-half times today's output³⁴.

Where will that increased output go, and where does it go to even today? There is a group of inter-related concerns about local needs for food and nutrition. What these cost and for which categories of consumers, the ability of households to find and buy affordable food staples are matters that continue to be neglected because the coordination this demands is not yet recognised as an outcome, let alone a target. Although in the name of consultation and planning, the Government of India routinely discusses the need for 'convergence' between programmes run by ministries, there is scarcely any. The Ministries of Agriculture, Rural Development, Women and Child Development and Health do not come together to examine districts and blocks and tehsils, rather than each through their own lens, to agree on measures that benefit the households who bear the multiple burdens of high food prices, poor access to food, high burdens of communicable diseases and suffer from low health and human development indices. In its note on 'Issues for the Approach to the Twelfth Plan' (2011 April), the Planning Commission said as

much: "There is a perception that government programmes, especially centrally sponsored schemes, are not sensitive enough to local needs. Also, government works in silos with little effort to achieve convergence and co-ordination across ministries and between centre and states, even though most problems require inter-governmental and inter-ministerial co-ordination."

From a reading of the early results of the 66th Round of the NSSO, 'Key Indicators of Household Consumer Expenditure in India, 2009-10', the most vulnerable lower income deciles of the rural population are found to be in Assam, West Bengal, Bihar, Jharkhand and Orissa (although those represented by low monthly per capita expenditure (MPCE) deciles from Gujarat, Karnataka, Uttar Pradesh and Andhra Pradesh are also vulnerable), all registering a food MPCE percentage of over 65% of the total MPCE³⁵. What of the urban population, in all deciles including those that comprise the urban poor? Bhiwani in Haryana (population 197,662), Bhind in Madhya Pradesh (197,332), Amroha in Uttar Pradesh (197,135) and Hardoi also in Uttar Pradesh (197,046) are four urban centres whose populations are at the median of those towns in India whose inhabitants number over 100,000. The average number of children in each (in the 0-6 year age group) is 23,890. Based on the recommended daily dietary allowance calculated for an Indian vegetarian diet by the National Institute of Nutrition, India, the minimum annual demand of each of these four urban centres is: cereals and millets, 43,124 tons; pulses, 9,122 tons; milk and milk products (kilolitres), 33,172; roots and tubers, 22,115 tons; green leafy vegetables, 11,057 tons; other vegetables, 22,115 tons; and fruits, 11,057 tons³⁶. Whether through the lens of municipal services provisioning or as a consumer project, urban administrations rarely plan for the food required by their citizens – its sources, costs and alternatives that can help establish a nutrient cycle between urban consumption and rural producers.

Even under the directions of the Eleventh Five Year Plan, and discounting the policy-related changes brought in over the last 18 months, are the food needs of more urban centres – and still-expanding urban agglomerations – being met without affecting food access in rural districts? There is no reliable baseline to use which can answer such a query. The deficiencies in the current system of both area and yield estimation under the 'Timely Reporting System' (necessary to issue, among other bulletins, the four advance estimates each year) have scarcely been recognised, let alone dealt with in any meaningful way. The deterioration of the system of maintaining village land use and crop records – the basic source of primary data – is responsible. It has been pointed out that village-level revenue staff are overburdened with a variety of tasks; thus the maintenance of accurate and complete agricultural data is given a low priority³⁷. State aggregates of crop production are still, in the absence of satellite-based assessments that can be publicly and independently verified (or "ground truthed"), best guesses. Thus, the impact of the demands of urban centres - amplified by the allied sectors of food processing, food retail and agricultural logistics – on the populations of producing districts is still under-researched.

As long as it remains under-researched, claims about the miraculous abilities of biotech seeds and crop genomics will influence policy about food production and

crop movements. Not surprisingly, seed is the key for a second green revolution based on lab science and PPP investment. The crop biotech industry now regularly advises "timely high yielding seeds suitable for local conditions" and "breeding technologies and biotech help develop modern seeds delivering certainty of harvest". Corporate programmes from the biotech companies have been run in Maharashtra (Amravati district), Andhra Pradesh (Adilabad district, and Rajasthan (Bhilwara and Bundi districts) to grow corn under 'Project SHARE'; in Gujarat Monsanto's corn hybrid seeds under the Dekalb brand have been distributed through the company's 'Project Sunshine', described as a public private partnership under the 'van bandhu kalyan yojana' with the government of Gujarat; in Rajasthan through 'Project Golden Rays' which distributed Monsanto's Dekalb corn seeds under what was described as "India's largest corn farmer public private partnership with state government of Rajasthan"³⁸.

These are all examples of what Prime Minister Manmohan Singh has called a public sector lead with greater private sector investment and involvement in agriculture, and particularly in agricultural and crop research and development. It is a direction supported by the new goal of doubling the percentage of GDP spent on research (currently about 1%) by the end of the Twelfth Plan period. Singh has said he sees greater integration of the agricultural, industrial and science and technology sectors of the Indian economy alone as providing "large productivity gains based on new innovations and technologies"³⁹.

In this, he is supported by the International Crops Research Institute for the Semi-Arid Tropics (Icrisat), one of the 15 CGIAR institutes and which has been headquartered in India since 1972. In the view of Icrisat, the need for a second green revolution can be couched in terms that appeal to the central government's development objectives, and which also align with the 'green economy' and 'low carbon' ideas that are in vogue today. However, Icrisat's approach is all business (an approach that has won admiration from elsewhere in a CGIAR system that is marching to a donor drum rather than coordinating crop research for cultivators, which was its original science motivator).

Icrisat has set up what it calls an Agribusiness and Innovation Platform which includes agri-business incubation by "improving the well-being of poor farmers through the creation of competitive agri-business enterprises by technology development and commercialisation", and which also includes 'innovation and partnerships to develop collaborative research partnerships with public, private and allied sectors to benefit the smallholding farmers of dryland tropics across the agricultural and agribusiness value chain"⁴⁰. This 'platform' includes a programme known as 'Nutriplus' which is described as "value addition and post-harvest management in agri-food sector through innovative processing and product development enabling achievement of Icrisat's vision of 'a prosperous food secure and resilient dryland tropics". Finally, the agri-business incubation is being done in partnership with ten institutes of India's national NARS, the express aim being to promote agri-business ventures and to enhance technology commercialisation⁴¹.

So firmly has the idea of spinning agri-businesses out of India's NARS gripped the Ministry of Agriculture, that in August 2011 the Union Cabinet approved the

proposal by the ministry's Department of Agricultural Research and Education (DARE) to set up a company called Agrindia. To be structured as a public sector company, Agrindia's main task is to protect and manage intellectual property created by the NARS and find ways to commercialise these (using the fig leaf of 'for public benefit'). Agrindia will also busy itself with "the production, marketing and popularisation of ICAR's products, processes and technologies in agriculture and allied sectors", a description from whose net little has escaped - seed (this includes livestock, fodder and aquaculture), planting material, vaccines, diagnostics, biotechnological products, value-added inputs and products, and also farm implements and machinery⁴².

Conclusion

An outlining of these five factors helps describe the transformation taking place in India's agriculture and crop cultivation choices, in the patterns of food movement and the effect of these on nutrition on different income classes in rural and urban habitats. The rise in the price of a regional basket of food staples which began to describe a new upward trajectory from 2007 onwards has not abated almost five years later. Whether the result of the transmission of international agricultural commodity prices and the transference of the volatility in those trading structures, or whether from domestic and intra-state networks that deal in foodgrain and horticultural produce movement - now being rapidly absorbed into the new agri-food-logistics networks which tie together the retail and processed food business and agricultural commodity exchanges - the effects of this upward trajectory is beginning to be seen in nutrition and health indicators.

The National Nutrition Monitoring Bureau (NNMB) has been collecting information on the diets of and on the nutritional status of rural households for ten major states since 1974-75. This series of data shows that over the last decade - 2000 to 2010 - there has been a considerable decline in cereal intake both in urban and rural areas, and this has been accompanied by a decline in the dietary intake of pulses - the major source of protein in Indian diets - over the same period. "This can be partly attributed to the soaring prices of pulses and therefore inability of the poor people to purchase adequate amounts of pulses," the Report of the Working Group on Nutrition for the 12th Five Year Plan 2012-17 has said. This report has also mentioned that the intake of milk and milk products, fruits and vegetables continues to be very low, and that urban areas also show the same declining trend in the intake of cereals and pulses. The effect on continuing high prices of food staples has been singled out by the report: "Although India's food production is adequate to meet the needs of the growing population, the country too witnessed an increase in food prices cutting across the whole spectrum of foodstuffs. But the steep rise in the prices of pulses, vegetables, oils and dairy products has resulted in further reduction in the already low consumption of these among low and middle income families."⁴³

The 66th Round of the National Sample Survey Organisation, through its report on nutritional intake, is the first NSS round to collect the state of food and nutrition following the 2007-08 food price peaks and subsequent spells of persistent high food inflation. The average calorie intake per person per day has fallen over time, in the rural areas from 2,256 calories to 2,153 calories between 1972-73 and

1993-94, then was recorded as recovering up to 2,149 calories in 1999-2000 but regressed to 2,020 calories in 2009-10. In urban areas, calorie intake per person per day declined marginally from 2,107 to 2,071 between 1972-73 and 1993-94, improved to 2,156 in 1999-2000 and then declined steeply to 1,946 calories in 2009-10⁴⁴.

It is a huge pity that the Government of India has over the past few years – certainly more conspicuously over the duration of the Eleventh Plan period – fallen in line with the public position taken by the alliance which today governs agriculture research and food management globally. This is, in unequal parts and subject to political flux, an alliance dominated by the crop science and climate science cohorts, many from the CGIAR network, with a fast-growing second tier from the national agricultural research systems of client countries, most notably Eastern and sub-Saharan Africa. But it is also influenced in direction and with money by the donors – the Rockefeller of the 1950s has been replaced, to an extent, by a vastly better equipped and much larger Gates Foundation, but the food aid and foreign policy dimensions are as manifest today as they were then.

Hence the Government of India is repeating the misdiagnosis, only slightly modified, of impending hunger in India as being a consequence of a lack of food, if not tackled today, and if not tackled by technological means. Major campaigns that have mobilised education about and therefore opposition to matters such as genetically modified food and seed, such as the state-sponsored conversion of agricultural land into new townships and special economic zones, such as food price inflation which will only become more acute as infrastructure and urban markets decide the currency, are being quickly outflanked by the clever methods that support this misdiagnosis. These methods are adopted by the Government of India but most are borrowed. If the focus was for years industrial methods (including command area development, synthetic fertiliser and a NARS which ignored traditional knowledge) for raising agricultural production (the APY equation of area, production and yield), then today it is exotic genomic crop science and complex, financialised agricultural commodity markets (even Agmarknet has begun promising ‘price discovery’ through ‘digital mandis’) which are promoted in lieu of real food security policy.

The switch in planning focus - from rural livelihoods of the last two plan periods to production, food distribution infrastructure and crop science in the Twelfth Plan – has continued to sideline discussion about an agro-ecological development paradigm that may be based on the revitalisation of small farms. Practitioners’ evidence provided throughout the last decade - from the organic farming networks of India and also from low external input cultivators - is that in the face of increasing oil prices and climate change, such farming is far more agro-ecologically efficient. Moreover, such agricultural systems for smallholder farmers emphasise diversity, synergy, recycling and integration, and encourage social processes that value community involvement and empowerment. The value that these characteristics provide can be seen in the popularity, in some states, of the cultivation of micro-plots, which bestow self-sufficiency to families for most of the fruits and vegetables they need and allow them to sell excess produce, providing a small income to supplement their earnings as wage labourers – outstanding

examples are the 'Indira Karanthi Patham' project (IKP) in Andhra Pradesh, the 'Namma Bhoomi - Namma Thota' ('My Land - My Garden') programme in Karnataka, the 'Chash o Basebaser bhumi-dan Prakalpa' (cultivation and dwelling plot allocation scheme) in West Bengal and the Vasundhara scheme in Odisha⁴⁵.

How very different an agricultural pathway this from the consequences of multiple trade regimes and the relentless treadmill of the financialised agri-commodity markets with their food industry alliances, which have mercilessly exposed Indian agriculture to inadequate support prices for farm produce and volatility in the prices of food staples at home⁴⁶. India's central government, its national agricultural research system, the industrial cultivation-food retail industry and the expanding commodities markets continue to advance the view – now cemented as policy – that hunger in India is caused by a technological gap. In these quarters a unitarian dogma is held – that all food producing systems other than the one to be imposed by a second Green Revolution will produce insufficient volumes. As the leaders of the G20 were reminded in mid-2011⁴⁷, honesty is called for, an honesty that recognises the wrongs of policy and practice, that hunger is not caused by demographic problems alone, and that it is political factors which condemn small farmers to hunger just as surely as they push small consumers towards malnutrition.

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Table 1

The rise in the Indian agricultural commodity indices since 2008 January												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NCDEX agri inde	100.00%	103.81%	109.98%	102.64%	108.82%	114.25%	121.98%	119.35%	113.30%	107.60%	107.38%	108.07%
MCX agri index	124.02%	131.90%	128.35%	117.53%	102.91%	101.20%	105.35%	105.05%	104.23%	101.04%	100.00%	111.93%
2009	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NCDEX agri inde	113.88%	115.65%	115.95%	126.51%	129.61%	128.87%	132.82%	142.52%	139.83%	148.20%	164.84%	162.53%
MCX agri index	116.45%	118.04%	122.79%	139.21%	142.96%	143.03%	139.75%	148.69%	145.79%	146.39%	159.32%	164.43%
2010	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NCDEX agri inde	153.88%	145.46%	142.39%	144.61%	147.62%	149.12%	153.99%	152.07%	147.64%	150.69%	158.47%	160.62%
MCX agri index	157.72%	154.23%	154.81%	155.38%	153.71%	154.87%	159.37%	165.91%	158.84%	178.28%	192.88%	196.52%
2011	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NCDEX agri inde	166.52%	172.59%	166.66%	167.08%	169.63%	169.79%	181.42%	182.51%	191.08%	189.63%	194.01%	203.71%
MCX agri index	204.58%	209.09%	200.35%	183.22%	182.86%	184.74%	197.02%	204.59%	216.12%	208.66%	217.53%	217.73%
2012	Jan	Feb										
NCDEX agri inde	227.52%	253.58%										
MCX agri index	230.85%	238.00%										

50 months data, monthly average of each index, based to their minimum for the period.

Data from NCDEX <<http://www.ncdex.com/>> and from MCX <<http://www.mcxindia.com/>>

References and Notes

1. Rice, 102.75 mt; Wheat, 88.31 mt; Jowar, 6.09 mt; Bajra, 9.73 mt, mt; Maize, 21.6 mt; Ragi, 2.26 mt; Small Millets, 0.72 mt; Barley, 1.68 mt; Coarse Cereals, 42.08 mt; Cereals, 233.14 mt; Tur, 2.72 mt; Gram, 7.66 mt; Urad, 1.73 mt; Moong, 1.72 mt; Other Kharif Pulses, 0.91 mt; Other Rabi Pulses, 2.54 mt; Total Pulses, 17.28 mt; Total Foodgrains, 250.42

Source: Second Advance Estimates of Production of Foodgrains 2011-12, Department of Agriculture & Cooperation / Directorate of Economics & Statistics / Agricultural Statistics Division, Ministry of Agriculture, released on 03 February 2012

2. From 2008 January agri-commodity indexes of the NCDEX and the MCX have gained in points as described by Chart 1. From 2011 April their rise has been especially rapid, the MCX index gaining 55% and the NCDEX index gaining 86% until 2012 February.

3. Approach Paper 12th Plan para 5.28 pg 67

4. McKinsey Global Institute, India's urban awakening: Building inclusive cities, sustaining economic growth, pg 151

5. The Report of the Twelfth Plan Working Group on Disadvantaged Farmers, Including Women, Planning Commission

6. Approach Paper, Twelfth Five Year Plan, para 7.6 pg 89, Planning Commission, Government of India

7. 'Industry Meet 2011 Inaugurated / Shri Pawar Calls for Closer Partnership Between Industry and Agricultural Research', Indian Council of Agricultural Research (ICAR), 23 May 2011, < <http://www.icar.org.in/en/node/2894>>. The ICAR Director General is Dr S. Ayyappan, who is also Secretary, Department of Agricultural Research and Education.

8. <http://www.assochem.org/prels/shownews.php?id=2970>
FDI in multi-brand retail to boost food processing industry: ASSOCHAM
06 July 2011

9. Attending this meeting were the Union Minister of Agriculture, Sharad Pawar, the Secretary of the Department of Agriculture and Cooperation, and the Secretary of the Department of Food Processing Industries. Representing the food and agri-business industry was a group from CII led by Rakesh Bharti Mittal of Bharti Enterprises (the partner in a cash-and-carry business of Wal-Mart).

10. As per the Provisional Population Totals of Census 2011, the total population of India was 1210.2 million. Of this, the rural population stands at 833.1 million and the urban population 377.1 million. The rural population formed 68.84% of the total population with the urban population constituting 31.16%. In absolute

numbers, the rural population has increased by 90.47 million and the urban population by 91.00 million in the last decade. The growth rate of population for India in the last decade was 17.64%. The growth rate of population in rural and urban areas was 12.18% and 31.80% respectively. From 'Provisional Population Totals, Paper 2, Volume 1 of 2011, Rural-Urban Distribution, India Series 1', Census of India 2011, by Dr C Chandramouli, Registrar General & Census Commissioner, India (2011)

11. CII Recommendations on Agriculture and Food Laws

<http://www.ciionline.org/PolicyAdvocacyDetails.aspx?enc=OyNaU9H59xoYqzGdpEF2ZaLBCjn9LkxPLZBfrNnnU1Cum9hZFnlkvLcMrrmC8mUHv8TeUPr7YQYN5oibtJRDTw==>

12. In September 2011, a state Agriculture Marketing Ministers' Committee called for amending the APMC Act and Rules. The committee submitted its first report to the Union Minister for Agriculture, and in the report asked states to amend the APMC Act on the lines of Model Act and to notify the Rules "at the earliest". The Committee is headed by Harshvardhan Patil, Minister of Cooperation, Maharashtra. The 11-member Committee called for "providing choice of multiple and competitive market channel to farmers, independent regulatory authority to encourage private investors and simple and smooth license and registration of traders in mandis". Press Information Bureau (PIB), <http://pib.nic.in/newsite/erelease.aspx?relid=75782>

13. 'How 'rural' is India's agricultural credit?' by Pallavi Chavan, The Hindu, August 12, 2010

<http://www.thehindu.com/opinion/op-ed/article566888.ece>

This article pointed out that even within direct agricultural finance, which goes directly to farmers, there was a sharp rise in the number of loans with a credit limit above Rs.1 crore. "It seems likely that these large loans were advanced towards financing the new activities added to the definition of agricultural credit." Moreover, the article said that there has been a sharp growth of agricultural finance that is urban in nature. Between 1995 and 2005, the share of agricultural credit supplied by urban and metropolitan bank branches in India increased from 16.3 per cent to 30.7 per cent. The share of agricultural credit supplied by metropolitan branches alone increased from 7.3 per cent in 1995 to 19 per cent in 2005. While there was a moderate decrease in these shares between 2006 and 2008, urban and metropolitan branches continued to supply about one-third of the total agricultural credit in 2008. Concurrently, there was a sharp fall in the share of agricultural credit supplied by rural and semi-urban branches from 83.7 per cent in 1995 to 69.3 per cent in 2005. In 2008, the share of rural and semi-urban branches in total agricultural credit was 66 per cent.

14. 'Provisional Results of Annual Survey of Industries 2009-2010', Ministry of Statistics and Programme Implementation, Central Statistics Office, Government of India, 30 December 2011.

Total number of estimated factories is 1,58,877, which is 2.3% higher than that of the last year. Among the industries, highest number of factories is observed in 'Food products', which accounts for about 16.5% of the total factories in all industries followed by 'Other non-metallic mineral products' (11%) and 'Textiles'(8.4%). Among the states, highest number of factories is observed in Tamil Nadu (16.9%), followed by Maharashtra (12.2%), Andhra Pradesh (10.8%), Gujarat (9.8%) and Uttar Pradesh (6.9%). Employment in terms of total persons engaged has increased by 4.1% at all India, over the previous year, whereas the emolument (compensation) to employees has increased by 13.6% in current prices and 11.1% in real terms. Among all industries, 'Food products' generated the highest employment (12.5%), followed by 'Textiles' (11.7%) , 'Basic metals' (7.6%), 'Wearing apparel' (7.3%) and 'Other non-metallic mineral products' (6.8%).

15. 'Prospect of limiting the global increase in temperature to 2°C is getting bleaker', 30 May 2011

http://www.iea.org/index_info.asp?id=1959

The IEA briefing said that energy-related carbon-dioxide (CO₂) emissions in 2010 were the highest in history, according to the IEA estimates, after a dip in 2009 caused by the global financial crisis, emissions were estimated to have climbed to a record 30.6 gigatons (Gt), a 5% jump from the previous record year in 2008, when levels reached 29.3 Gt.

16. Hence the importance accorded, even by the global climate negotiations under the UNFCCC, to gatherings such as the International Conference on Climate Change and Food Security which was held in Beijing, China, in early November 2011. Organized by the Chinese Academy of Agricultural Sciences (CAAS) and the International Food Policy Research Institute (IFPRI, the policy advocacy unit of the CGIAR and therefore its most influential element), scientists from the BRICS countries (Brazil, Russia, India, China, and South Africa) and from Indonesia and the USA attended.

17. The Climate Change, Agriculture and Food Security (CCAFS) programme of the CGIAR. <http://ccafs.cgiar.org/>

18. The ICAR National Initiative on Climate Resilient Agriculture (NICRA) involves 21 ICAR institutes out of which seven are designated "core institutes" in which "state of the art research infrastructure and equipment will be installed for climate change research on irrigated crops, rainfed crops, horticulture, livestock, fisheries and energy efficiency". <<http://www.nicra-icar.in/>>

These seven institutes are: Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad; Indian Agricultural Research Institute (IARI), New Delhi; Indian Institute of Horticultural Research (IIHR), Bangalore; National Dairy Research Institute (NDRI), Karnal; Central Marine Fisheries Research Institute (CMFRI), Cochin; Central Institute of Agricultural Engineering (CIAE), Bhopal; and ICAR-Research Complex for NEH Region, Barapani, Shillong (which will represent the north-east region).

The 14 institutes which are to conduct "thematic research across crops and agro-climatic zones" are: Indian Veterinary Research Institute (IVRI), Izatnagar; Central

Inland Fisheries Research Institute (CIFRI), Barrackpore; Central Institute for Brackish Water Aquaculture (CIBA), Chennai; National Institute for Abiotic Stress Management (NIASM), Baramati, Pune; Central Rice Research Institute (CRRRI), Cuttack; Directorate of Rice Research (DRR), Hyderabad; Indian Institute of Pulses Research (IIPR), Kanpur; Indian Institute of Vegetable Research (IIVR), Varanasi; ICAR Research Complex for Eastern Region, Ranchi; NRC on Plant Biotechnology, New Delhi; National Centre for Integrated Pest Management (NCIPM), New Delhi; National Research Centre for Agro Forestry (NRCAF), Jhansi; Directorate of Water Management, Bhubhaneshwar; and Project Directorate for Farming System Research (PDFSR), Modipuram.

19. 'Agri-biotech firms pin hopes on BRAI Bill', 23 August 2011

http://www.dnaindia.com/money/report_agri-biotech-firms-pin-hopes-on-brai-bill_1578662

20. 'Exploring the Agriculture-Nutrition Disconnect in India', by Gillespie, S. and Kadiyala, S., 2020 Conference Brief 20, 2011, prepared for the IFPRI 2020 International Conference "Leveraging Agriculture for Improving Nutrition and Health," held in New Delhi on 10-12 February 2011.

21. For the last five years, the selection and distribution of the RKVY projects, and the considerable funds available to run them, are supposed to be the outcomes of district agricultural development plans. As Table 2 shows, the distribution and budgets vary widely between states and between RKVY sectors. Some states and some sectors have been favoured heavily, with the available yojana material explaining neither the rationale for these choices nor the durability of their outcomes. With 1,267 separate projects and their sectors having been allocated, monitoring the RKVY qualitatively is overdue.

Examining the distribution of projects and budgets between the larger states with the help of Table 2 shows what are likely to be biases and/or failures in the district agricultural development plan process: West Bengal has had one project of over Rs 100 crore (a Rs 245 crore animal husbandry project in 2010-11), Uttar Pradesh has had seven (a Rs 283 crore irrigation project in 2011-12 being the highest single allocation), Tamil Nadu has had one (Rs 106 crore for a marketing and post-harvest management project in 2010-11), Rajasthan has had five (including a Rs 261 crore horticulture project in 2010-11 and a Rs 239 crore irrigation project in the same year), Maharashtra has had eight (the highest allocation being of Rs 544 crore for irrigation in 2010-11, followed by a Rs 272 crore project for animal husbandry in 2008-09), Madhya Pradesh has had ten (including the largest single RKVY allocation of Rs 3,764 crore, for an irrigation project in 2009-10, followed by Rs 784 crore also for irrigation in 2008-09, and Rs 301 crore on 'other/innovative programmes' in 2008-09), Karnataka has had five (a Rs 499 crore 'other/innovative programmes' in 2011-12 being the highest allocation, followed by a Rs 366 crore project on agriculture mechanisation in 2008-09), Himachal Pradesh has had two (the larger being a Rs 459 crore fisheries project), Gujarat has had four (including the RKVY's third largest allocation of Rs 1,334 crore project on crop development in 2010-11), Chhattisgarh has had one (the RKVY's second largest allocation of Rs 1,437 crore on seeds in 2011-12), Assam has had

one (Rs 140 crore on irrigation in 2010-11), and Andhra Pradesh has had six (the highest being a Rs 221 crore project on horticulture in 2011-12). Of the Rs 31,629.73 crore spent on the RKVY sectors for five years, Rs 7,532.06 crore has been spent on irrigation projects, Rs 3,541.82 crore on seed projects and Rs 2,882.81 crore on animal husbandry projects as the three sectors allocated the most funds.

22. Britannia Nutrition Foundation <http://www.britannia.co.in/bnf/>

23. The Global Alliance for Improved Nutrition (GAIN) was created in 2002 at a Special Session of the UN General Assembly on Children, GAIN advocates public-private partnerships “to increase access to the missing nutrients in diets necessary for people, communities and economies to be stronger and healthier”. GAIN has received funding from a number of public and private sector donors including: the Bill and Melinda Gates Foundation, the Canadian International Development Agency (CIDA), the Children’s Investment Fund Foundation (CIFF), Dubai Cares, the Goldsmith Foundation, the Government of the Netherlands, the Khalifa Bin Zayed Al Nahyan Foundation (KZNF), the United States Agency for International Development (USAID) and the Wellcome Trust.

<http://www.gainhealth.org/>

24. The Naandi Foundation - <http://www.naandi.org/>

The electronic version of the ‘Hungama Report’ on child malnutrition in India is available at <http://www.naandi.org/CP/HungamaBKDec11LR.pdf> - and at

<http://www.hungamaforchange.org/>

<http://www.thehindu.com/todays-paper/tp-features/tp-metroplus/article1103772.ece>

25. 'Strengthening the Role of Agriculture for a Nutrition Secure India', Kadiyala S., Joshi P.K., Mahendra Dev S., Nanda Kumar T. and Vyas V., International Food Policy Research Institute (IFPRI) policy note, December 2011.

This policy note was based on the work conducted under the Tackling the Agriculture-Nutrition Disconnect in India (TANDI) initiative funded by the Bill & Melinda Gates Foundation and the 13 September 2011 'Strengthening the Role of Agriculture for Nutrition Secure India' consultation organised by IFPRI and the Indira Gandhi Institute of Development Research (IGIDR) and funded by the British government's Department for International Development (DFID).

The note also said that decentralised procurement of foodgrains under the Public Distribution System must be mandated to ensure revival of agriculture in resource-poor areas; that inclusion of nutritious and diverse foods (such as millets, eggs, soy beans, and so on) in the decentralised procurement basket offers an excellent opportunity to provide locally acceptable nutritious food to the people while mitigating the problems of storage of these cereals; and finally that it also offers a real potential to fortify food commodities with key micronutrients (for example, fortifying wheat with iron) while consideration can be given to food stamps or conditional cash transfers targeted to women for the purchase of perishable nutrient-rich foods.

26. Partnership Agreement For The Agriculture and Food Security Program, USAID
http://www.usaid.gov/in/our_work/pa_fs.html

27. The Indo – U.S Agricultural Dialogue. In March, 2010, the USG and GOI signed a Memorandum of Understanding on Agricultural Cooperation and Food Security (MOU), signaling their commitment to work together, bilaterally, and in cooperation with other countries, to achieve common goals in food security, increasing agricultural productivity and reducing malnutrition in our own countries and globally. That MOU articulated joint objectives to further the work of the Indo–U.S. Agriculture Dialogue.

28. 1. FARMS: The FARMS Project is designed to address critical constraints to improving agricultural productivity and ensuring food security in India. The FARMS project will focus on increasing productivity of principal crops, promoting improved natural resource management practices and addressing the challenges of climate change, strengthening linkages of farmers to the value chain, and nutrition improvement at the farm household level, particularly for adolescent girls. Interventions are expected to generate lessons-learned and spillover benefits outside of India with global and regional public goods to increase global food security. The FARMS Project will be implemented by undertaking analytical work on challenges facing Indian agriculture that are relevant to food security. and through design and implementation of a series of good practices in the form of pilot projects that test their efficacy to increase farmers' incomes and improve nutrition.

2. AEISP: AEISP is designed to improve capacity for teaching, research and extension of Indian higher educational institutions so that they are able to better respond to the professional needs of a market-led agricultural system. Agricultural innovation now requires professionals to emphasize the development of skills in accessing and applying available information for solving agricultural development problems with more sustainable institutional arrangements. AEISP will help improve agricultural productivity and market competitiveness through the application of science, technology and information, provided through effective agricultural knowledge and information systems.

The AEISP will have two major components: 1) Improving agricultural education at selected Indian institutions; and 2) Improving the delivery of agricultural extension services. This will be accomplished by establishing linkages between Indian institutions and U.S. land grant universities and could include modernizing curricula and staff training that promotes innovation in teaching, research and extension.

3. CSISA: The Cereal Systems Initiative for South Asia (CSISA), jointly funded by USAID/Washington and the Bill and Melinda Gates Foundation, is a new public-private collaborative endeavor in cereal cropping systems in South Asia.

USAID/India would join the CSISA program by supporting activities that take place in India and that will have the most immediate impact on farmers and farming systems in India. An alliance of Indian research institutes and international partners, jointly supported by USAID and the Gates Foundation, can: (1) increase the availability of seeds of high-yielding, stress-tolerant, high quality rice, wheat and maize and legume varieties and hybrids; (2) improve farmers' access to information; (3) promote adoption of water and energy saving management

practices; and, (4) enhance both adaptation to, and mitigation of climate change in India.

29. 'Syngenta to enhance rice output in eastern states', Business Line, 23 August 2011

<http://www.thehindubusinessline.com/industry-and-economy/agri-biz/article2388476.ece>

30. 'Innovate to progress', By Rajiv Shah, in Hindustan Times, 20 December 2011

<http://www.hindustantimes.com/StoryPage/Print/784644.aspx>

Shah also wrote: "As a result, nearly two-thirds of these farmers have increased their productivity by 25%. For a small commission, Village Health Champions supply rural communities with health products like water purification devices and menstrual hygiene products. They also serve as community-based public health entrepreneurs, raising awareness and linking the community with key health programmes."

31. 'Entrepreneurship, not aid, is our priority in India', interview with Rajiv Shah on the partnership between India and the US through USAID, in Indian Express, 23 December 2011

<http://www.indianexpress.com/story-print/891045/>

Shah also mentioned "a few basic principles that we have sought to bring to light through our US-India partnership in food security". He talked about "the need to make reforms that open up the agriculture sector to private investment: private companies that can help manage the supply chains, help ensure we reduce post-harvest losses, play a big role in helping farmers get appropriate inputs and sell insurance products and other things, so that farmers are protected from the risks that pose significant challenges".

In the interview, Shah emphasised that scientific and technical cooperation can help achieve better outcomes, and that this is the reason "why we reinvigorated these partnerships between the Indian agricultural research system and US universities on heat-resistant and stress-resistant crops in particular".

32. 'FDI in multi-brand retail to boost food processing industry: ASSOCHAM', 06 July 2011

<http://www.assochem.org/prels/shownews.php?id=2970>

In this release ASSOCHAM secretary general D.S. Rawat said: "There exists a huge gap in agriculture output, post-harvest produce and processing. Despite high growth and large investments in recent years, the industry is still dominated by small scale and unorganised sector mainly involved in producing low value added products."

33. '53 million-plus cities vs 355 million-plus districts' by Rahul Goswami, Infochange India, November 2011

<http://infochangeindia.org/population/analysis/53-million-plus-cities-vs-355-million-plus-districts.html>

34. At the Global Summit on Green Revolution II, Growth Engine for Transformation, which took place on 15 June 2011 in Hyderabad.

35. 'Food Prices, Health and Nutrition: Red-flag indicators for the 12th Plan', By Rahul Goswami, Macroscan, August 2011.

There is a similar distribution of states in the readings for urban poor. The 20 decile classes which show the highest percentage of expenditure (out of the total MPCE) on food all register above 61%. However, 107 out of the 200 readings for urban MPCE show expenditure on food as over 50%. Again, the lower income deciles of urban residents in Bihar, Assam, West Bengal, Jharkhand and Orissa are concentrated at the higher end of the list.

36. Census of India 2011, Provisional Population Totals, Paper 2 of 2011 (India, Vol II)

37. Interim Report of the Expert Committee on Agricultural Statistics, Department of Agriculture and Cooperation, July 2010

The report further explained: "Supervision of land agriculture related records is increasingly rare and far too perfunctory to ensure their completeness and accuracy. The trend to shift from the traditional system of appointing village officials into one where they are drawn from a transferable cadre adds greatly to the difficulties of collecting data based on first hand inspection of all plots. Over the years the priority attached by state revenue departments in ensuring maintenance of complete and reliable land use and crop data has declined to the point of indifference. Periodic inspection of these records by higher level officials has become increasingly rare and lax."

38. i. 'Rajasthan opens farm gates', 15 November 2010, Down To Earth

<http://www.downtoearth.org.in/node/2168>

ii. 'Rajasthan ignores seed advice', 31 January 2011, Down To Earth

<http://www.downtoearth.org.in/content/rajasthan-ignores-seed-advice>

iii. Submission by the state government of Rajasthan at the National Conference on Agriculture Rabi Campaign 2010-11, held on 17-18 September 2010, Department of Agriculture and Cooperation, Ministry of Agriculture

iv. Tribal Development Department, Government of Gujarat

<http://www.vanbandhukalyanyojana.gujarat.gov.in/>

v. 'Improve Farmer Lives: Project SHARE (Sustainable Harvest Agriculture, Resources and Environment)', presentation by Gyanendra Shukla, Director, Mahyco Monsanto Biotech, at the Assocham 'Global Summit on Green Revolution II - Growth Engine for Transformation', 15 June 2011 in Hyderabad.

39. Prime Minister Dr. Manmohan Singh's address at the Golden Jubilee of the Indian Agricultural Research Institute (IARI) on 27 Feb 2012.

Singh also said: "We need to promote structured public private partnerships, to foster better synergy among institutions and disciplines. However, for this to happen on an adequate scale, we need to expand the mode of scientific research by funding not just institutions but also research platforms that cut across institutions. Individual researchers and research groups, whether in the National Agricultural Research System, universities, CSIR, scientific establishments or the private sector, should be enabled to form platforms for joint research in key priority areas. These should be funded subject to quality peer review. I am

therefore happy that the Indian Council of Agricultural Research has proposed some extra mural funding along these lines in the XIIth Plan.”

40. 'Agribusiness incubation and entrepreneurship key for vibrant agricultural development', ICRISAT Press Release, 10 February 2012, at the 2nd Global Agri-Business Incubation Conference of the Network of Indian Agri-Business Incubators (NIABI) 2012.

'Inclusive market-oriented development key to second Green Revolution', ICRISAT Press Release, 17 June 2011, at the global summit on Green Revolution II - Growth Engine for Transformation, organised by the Associated Chambers of Commerce and Industry of India (Assocham) in Hyderabad on 15 June.

41. The ten institutes are: Indian Agricultural Research Institute (IARI), Indian Veterinary Research Institute (IVRI), Central Institute for Research on Cotton Technology (CIRCOT), National Institute of Research on Jute and Allied Fibre Technology (NIRJAFT), Tamil Nadu Agricultural University (TNAU), Anand Agricultural University (AAU), Chaudhary Charan Singh Haryana Agricultural University (CCSHAU), Birsa Agricultural University (BAU), Jawaharlal Nehru Krishi Vishwavidyalaya (JNKVV) and Central Institute of Fisheries Technology (CIFT).

42. 'Setting up of a new company 'AGRINDIA' by Department of Agricultural Research & Education', Press Information Bureau (PIB), Ministry of Agriculture, 11 August 2011

<http://pib.nic.in/newsite/erelease.aspx?relid=74427>

There are three more primary tasks Agrindia will tackle. These are: (1) providing skilled services from ICAR, such as consultancies, contract research, contract service, customized capacity building, technical support for turnkey project etc.; (2) setting up research and development farms and assist in setting up production units outside India, especially in Africa and in the Asia-Pacific region; and perhaps other regions of the world such as Latin America; (3) public-private partnerships in research, education and other capacity building in agriculture and allied sectors. Agrindia is to promote the spread of R&D outcomes through IPR protection, commercialisation and forging partnerships both in the country and abroad.

43. Report of the Working Group on Nutrition for the 12th Five Year Plan 2012-17, Planning Commission of India, pages 23-24

The report also discusses nutrition and pre-school children: “As per the NNMB report 2006, only one-third (30.1%) of the pre-school children were meeting the protein calorie adequacy. This clearly indicates undernutrition as a major problem among the preschool (0-3 years) children in India. Time trends of the intra-familial distribution of food indicates that the proportion of families where both the adults and pre-school children have adequate food has declined from 30% to 22% over the last 30 years, while the proportion of families with inadequate intake has come down substantially.”

44. 'Chronic Famishment', by C.P. Chandrasekhar, The Hindu, 19 February 2012, based on NSSO 66th Round, 2009-10, (NSS Report No. 540: Nutritional Intake in India)

<http://www.thehindu.com/opinion/columns/Chandrasekhar/article2910006.ece>

Chandrasekhar has noted that changes in the reference period adopted in the survey questionnaire for 1999-2000 tended to impart an upward bias to the estimate for that year and rendered the figure non-comparable with previous and subsequent estimates. "Hence the picture seems to largely one of continuous decline in average nutritional intake," he said.

The NSS computes figures on the extent to which nutritional intake falls short of or exceeds the level of 2700 calories per consumer unit per day. Those figures show that the calorific intake shortfall has increased over time. The percentage of consumption units in rural areas obtaining less than 80 per cent of 2,700 calories (which is 2,160 calories) rose from 22.7% in 1993-94 to 27.6% in 2004-05 and 25.8% in 2009-10. In urban areas the corresponding figure rose from 26.6% in 1993-94 to 28.2% in 2004-05 before falling marginally to 27.7% in 2009-10.

45. 'Securing Land Rights', *Leisa India*, Vol 13 No. 4, December 2011

46. 'The State of Agrarian Relations in India Today', V.K. Ramachandran, *The Marxist*, XXVII 1-2, January-June 2011

47. 'Food crises: five priorities for the G20', by the UN Special Rapportuer on the Right to Food, Olivier De Schutter, published on 16 June 2011 in *The Guardian*.
<http://www.srfood.org/index.php/en/component/content/article/1394-g20-agriculture-5-priorities-to-end-food-crises>