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Agricultural science and planning[1]

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Do agricultural science workers work better in a planning set-up or in an autonomous regime? I am not sure; so, I thought in the half hour of time you have given me—since you are a captive audience—I would share my question with you. My aim is that at the end of this lecture you should at least start thinking about this question.

For four decades I have worked closely with agricultural scientists and agricultural economists. The science establishment states that economists must work out the profitability and other requirements leading to the spread of their discoveries. Economists require the scientists to work out the technology, their growth and equity models.

To begin at the beginning, Indian planning was never the caricature –that corporate types and their journalist and political hangers-on make it to be—of a Soviet centralized Gosplan, and there was always in India a Gandhian leg of decentralized development, in addition to the Nehruvian vision of technological modernization (see Alagh 1988, 1991). The Director General (DG) of the ICAR (Indian Council of Agricultural Research), who would meet me to discuss their annual plans, were very clear they would decide the operational priorities. There was a day when I was on the Research Advisory Council with Rajiv Gandhi discussing the 'Mission Projects' of the late 1980s; the then ICAR DG asked, 'Sir, What about us?' When I raised it with the Prime Minister (PM), he asked 'What is it that our agricultural science men can do which is world-class?' The ICAR listed six crops beginning with hybrid paddy, castor, and so on. The PM said, 'Make them, set time targets, and fund them. If they fail, they suffer.' This, of course, is no way of planning agricultural research. Then what is the way?

At the planning end, the introduction of markets systematically into [the] decision-making of governments at different levels in a federal set-up goes back to the reforms initiated in the 1980s in Panchayati Raj, district planning, and agroclimatic planning. In terms of ideas, little happened after that. India in those days developed the structure of an economic policy apparatus of a strategically driven planning system with long-term objectives. A modern version of such a system should work on long-term requirements, and bottlenecks to achieve them, and not get into details like how many experiments a particular agricultural science project will do. This kind of planning was eroded after 1992 by Dr Manmohan Singh and in 2014 dismantled by the government (I am mentioning its origin because we are discussing a systemic—and not party-political—problem).

My belief, however, is that given the compulsions of the system and political developments already under way, strategic planning in a market economy will revive. Our man in the NITI Aayog keeps that approach alive and I am never surprised when he is given specific assignments by the Prime Minister's Office (PMO) with funds to work on land, water, and/or technology issues, with a long-term focus.

More generally, however, in its present avatar, the NITI Aayog is meant to do 'studies' and arrange discussions on policy issues. As several commentators have pointed

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out, there is no need to have a government organization for this purpose and there is no special reason to do 'studies' in a government organisation. India has a set of excellent institutions working on development issues.

In agricultural research there are ICAR Institutes and the State Agricultural Universities (SAUs). In the economics area there are UGC (University Grants Commission) Advanced Centres and ICSSR (Indian Council of Social Science Research) National Institutes and they all have excellent economics researchers. Many of them work on agricultural issues and 'studies' can be better done there rather than in a government set-up.

The Chinese National Development and Reform Commission does 'studies', it is pointed out, and it is the successor to the State Planning Committee (Alagh 2018), but the Chinese body also has a resource allocation role. At present, the Indian federal polity is under strain with the abolition of rule-based allocation systems. But my view is that the planning function has to be—and will be—revived (Alagh 2019).

Dr Manmohan Singh was a critic of planning, and in the 11th Five Year Plan there was considerable discussion on change of the planning process and resource allocation formulas between both the centre and the states and between states. Centrally Sponsored Schemes—both in number and implementation strategies—were changed. But critics like the last two PMs find the need of an agency to work on the policy aspects of development issues of a long-term nature; and, so, NITI Aayog works on sectoral policies of a strategic nature, like gender, demographics, and skill formation for a youthful workforce, the long-term perspective on water, and the long-term perspective on energy. The agricultural and rural sectors—your concerns—overlie each of these issues and, if pursued systematically, require a holistic view of development policy.

Structural reform policies

This debate on the possibility of adopting a strategic approach to economic policies in a market economy undergoing reform as an approach of policy planning is infructuous, since the NDA (National Democratic Alliance) government in August 2015 abolished the Planning Commission. At a meeting of experts called by the PMO and Planning Commission then, we had argued that this need not have been so, and that the Chinese experiment which was being quoted as a precursor was in a strategic policy-making framework. We believe this argument is important and so spelt it out in some detail after the planning reform meetings of the NDA we were called to (see Alagh 2018).

In a globalizing economy, Indian planning and our efforts will obviously have to be set in the global debates of the period rather than [in] fixed quantitative target setting. It is interesting that when the Nobel Prize winner Joseph Stiglitz now talks of counterfactuals that have succeeded and the theories that go with them, he discusses Poland and China, while in the early 1990s the references were also to India. There was then an Indian perspective on the country's positioning in the reform process. In the second half of the '90s and the early part of this decade, Indian economists were well represented in global journals, but there is no perspective on India's experience from an analytical point of view now. This is unfortunate from a knowledge point of view, since knowledge—as we know—is a source of growth and has practical planning consequences (see Taylor 2002). I am arguing for a nuanced stance on agricultural research in this phase of our history. I believe this is important for our work and would request the AERA to do more for us on this theme.

The world gets to interesting turning points at the time of global meltdowns, as in 1997–99, 2008–09, or the recent US–China trade crisis. Just like at the beginning of the decade of the 1990s, before Rio, there gets to be an air of questioning, at the end of the last decade of the 1900s, after 2008, and again now. The East Asian meltdown and the more recent financial crises led to an atmosphere of expectation from ideas. Why do such periods emerge?

The work of earlier scholars on the uneven nature of development in the 80s and early 90s did not lead to many questions. The East Asian meltdown did (see, for a description, Ricupero 1998) as interpreted by Alagh 2000). This by itself is a phenomenon which needs some exploration as a manifestation of power and global discourse. It is not human misery but a disruption of global processes which leads to demands for change, even though an understanding of under-development may be a requirement. Our research

planning will have to monitor on a real-time basis trends in the global economy if any strategic approaches are to be followed. It is not accidental that the earlier vice chairman heading the Indian Planning Commission was the sherpa to Prime Minister Manmohan Singh and the ones at NITI Aayog are sherpas to PM Modi for the G8 or G20 meetings.

Sectoral strategic priorities for NITI Aayog

If the NITI Aayog is to be taken seriously, its agenda should in my opinion be, among others, in demographics, energy, and water. Like China, it should also allocate resources for the long-term plan, which it is not mandated to do. A functioning Planning Commission in this and the next decade—whatever you call it—will have to be there to advise on the resource allocation process rather than leaving it to the Ministry of Finance.

Short-run programmes

An employment guarantee scheme integrated with a minimum need (now, basic needs) is a very short-run strategy, but it is a fixture for India. Can we integrate agricultural science with it, as in China? There is, for example, the argument that employment guarantees should be there only in poor districts and not in agriculturally developed districts. This is wrong. A wage floor in rural areas acts as an incentive for widespread technological modernisation and better land use in rural areas. It is not accidental that the agricultural revolution in Europe took place only as real wages started rising in the 19th century. A recent example in our Punjab is the small machine which removes the chaff and prepares the soil for the next crop in a matter of days, instead of stubble burning. It has become necessary after the migrants from Uttar Pradesh and Bihar are coming in smaller numbers from the east. These are planning and agricultural policy issues.

More widespread and compelling evidence is [to be found] from recent studies done in India. In fact, a lot of the recent discussion on the MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) is misplaced. A recent large ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) field survey shows that in developed districts successful MGNREGA programmes have led to a flurry of investment on the farm (Bhattarai 2014). Food security and employment strategies are an integral part of a development strategy and need planning coordination.

A diversion on climate change

The issue of climate change will land up in the NITI Aayog's lap in many ways and India, which is now marginal in the global debates, will again be in the centre, as earlier. Game theory is all about [the] reactions of different players (stakeholders) to assumed actions [performed] by other 'players'. To simulate the 'game' is an interesting way of analysing the 'future' or possibilities in an uncertain field. Conventionally, this would be done in voluminous academic tomes, at the end of which the uncertainty remains. A game, on the other hand, forces the analysts to be specific to the extent possible in an uncertain world. The context was set up by large countries (India, China, Brazil), the big blocs (the USA and the European Union), continental Africa, the multilaterals, and other groups, including business investors and the media. They were stimulated to play their role in the unfolding food security policies in the context of the global trade regime.

The first recognition was that the food security problem was not just in grains but in commodities like sugar, oil, animal husbandry products, vegetables, and fruits and, in a sense, the problem was more complex than foreseen in the last three decades of the last century. The switch away from grain took place at around $3,000 per capita in 1990 purchasing power parity (PPP) prices (see Alagh 2012). The question really was the derivation of policy such that distortions in agricultural trade regimes could be removed and incentives for the producers established such that a farmer would then take the maximum advantage of his resource endowments—of land, water, soil, and access to technology—and produce the agricultural commodity which goes into food security in a globally efficient manner. This was then seen as generating enough income, including for very small peasants and the wages of landless labourers. The obstructions in achieving these goals were listed, and different exercises were stimulated to play their role in removing such obstruction in other ways and through policies. This would obviously involve collaborative games between countries. If [the] crops cultivated were globally competitive, this exercise would very soon

develop an exciting, realistic paradigm and, given the professional commitment of the groups involved, almost realistic processes of communication and trade-offs.

The question then can be seen as showing a positive outcome that emerges from such cooperation of different actors facing a complex problem and, in that context, pushes them out of short-term, zero-sum policy stances. The organisers of the game would come out with their detailed profile of the exercise and its outcomes. The mechanism itself should be of interest as a planning tool—in the strategic policy context defined in this paper—in a country where shortages of irrigated land and water are increasingly anticipated.

Water

[A] shortage of water—2–10% of the projections of demand, with high growth—is seen in [the] economy-level projections. Extrapolations of demand from different sectors show that if business-as-usual continues, quantitative shortages of water are likely to emerge. Declining water use efficiency in agriculture, increasing urbanization, and unregulated industrialization pose significant challenges for the water sector in the future. Shortages, either of groundwater or surface water or both, are likely to be pronounced in the states of Andhra Pradesh, Gujarat, Haryana, Punjab, Tamil Nadu, and Maharashtra. This just makes the business-as-usual stuff impossible, for water is literally life.

Arable area has stopped growing; hence, the land constraint is far more severe. Growth will now have to be sourced from double cropping and yield increase. To avoid the unfeasibility problem of most projections, assume a vastly improved performance on the land and water management frontiers. It needs to be remembered that the balance groundwater reserves are now more limited. The groundwater overuse in 100 districts is a serious problem, and needs a special programme of replenishment and, I would suggest, linked with surface water use. This interesting work includes the sensitivity of the estimated resource flows of water available with the integration of surface flows with local small storage projects. Another way of looking at the severe land constraint is to see that the net area sown per person will go down from around 0.17 hectare to around 0.10 hectares. Gross area sown per person—currently around 0.2 hectares—will even, if cropping intensity increases very rapidly, go down to around 0.15–0.18 hectares.

The Minister of Water Resources has recently placed emphasis on solving river water disputes between states, and a legal commission is proposed to be set up. Such commissions delay conflict resolution. At the beginning of the century, I was asked by UNESCO (United Nations Educational, Social and Cultural Organization) to study water as an interdisciplinary problem. The paper I wrote had a section on solving river valley disputes (Alagh 2001). Earlier asked to arbitrate in a season's dispute on water sharing in the Cauvery river basin, following the apex court's directive, I had also suggested that a three-layer system—implemented in the Mekong Basin amongst nations which had actually gone to war with each other—be designed.[2] This system—at the highest level political, at the second level coordinative, and at the third level a delivery apparatus—was implemented, and [it] has worked reasonably well (Alagh 2016). These problems need constant attention.

I find that this work has applications all over the world. For example, that 2001 paper was used recently as a reference paper in solving a dispute between the USA and Mexico (see the reference to the solution of the water dispute in the border city of Nogales, Sonora, Mexico in Pritchard and Scott (2014). But in India problems endure—I believe partly because we leave them to lawyers rather than solve them in the Mekong sense.

Getting back to the basic problems of the water sector: they lie in the great vagueness [… over] rights to water, responsibilities and powers of different actors, a lack of a structure for planning, and, as we saw, dispute resolution. In view of this, … the Ministry of Water Resources asked me to chair a committee to develop a Draft Framework Law for the Water Sector (Government of India 2013) for the National Water

[2] We devised a three-tier system which was earlier tried in the Mekong, where countries—which had gone to war with each other—cooperated in a plan providing the minimum flow of water to the downstream Tonle Sap in the monsoon where the requirements of half a million persons had to be protected and this required change going upstream all the way. The Asian peasant is the product of a millennium of history and if policy is honest then s(h)e will respond.

Framework Law of the Government of India. This Draft Act has again been introduced in Parliament and [it] will impact our work. The framework is meant to provide the larger structure for organizing the support mechanisms to states and communities in their governing institutions at the levels that matter, the local government, community-based institutions (CBOs), the management of ponds, water bodies, watersheds, aquifers, and river basins. To the best of my understanding the only aspect in which the Draft Framework was prescriptive at the national level was [in] its requirement that a minimum amount of water must be the right of every Indian. For the rest, it is only designed [as] a structure to empower in detail and support the state governments, local governments, and governing institutions of the water sector to play their ordained role. I am confident that once it is understood, it will get a good hearing, which will help the act. Once it is passed, we as researchers will have to fall in line.

Action on solving water problems will be at the local, watershed, aquifer, state, and river basin level. This was the guiding mantra of the Draft National Water Framework Law. But it was not supposed to remain just a mantra. The draft suggested the mechanisms to give strength to the local, state, watershed, and river basin levels. Once these mechanisms are fully in place, as appropriate structures, the national role is largely that of support. But these support mechanisms can be critical for the appropriate government. Cutting-edge frontier technology in water delivery and development projects must be developed at home, and accessed in the world, and made available. Working best practices must be known and diffused. The development and applications of success stories will require data and information support. The framework attempts to set up the systems to aid the state governments, local bodies, and appropriate governments in these support mechanisms. These are planning issues, and the expertise must exist in the NITI Aayog and ICAR, so that the institutional memory is available to the relevant line ministry. These are science issues and as agricultural science workers we are there.

The framework provides for a web-based information system (WRIS). It will be state-of-the-art, comprehensive, and user-friendly. Geographic mapping systems and satellite-based technologies—all aspects in which India is good but has not used it for … decentralized systems like water—will be developed at the national level. These kinds of systems are interdisciplinary, farmer- and user-friendly, and well-honed to solve problems. In the 100 distressed groundwater districts, information [… provided in] real time to each farmer on water levels can be a major instrument for evolving better systems. For example, if you and I know how each of us is impacting exactly on the common aquifer, we can better evolve working systems. Similar examples abound of technology-based solution systems in groundwater, river basins, watersheds, and other water bodies recognized in the framework. These are planning functions.

In the framework it is provided that a minimum of 25 litres per capita per day can be provided free of cost, but after meeting this pre-emptive need, available water will be subjected to allocation and pricing on economic principles to avoid waste and ensure supplies. This aspect is not covered in the proposed law. As regards demand for water, therefore, [the] policy will need to be concerned with both the basic needs of water of poor people and the need of informed directions of water systems as markets play a larger role. As we implement these, the role of hybrid systems (dual pricing) which can illuminate transitional paths will be particularly rewarding.

The implications of these trends are not being realized with the urgency they deserve, since at a basic level the resource constraints of a more severe kind faced by certain East Asian economies are now being approached in India. Organizations, communities, households, and individuals will have to grasp this fact and live with it. The severity of the blow will take time to sink in. But time India does not have. A few years ago, I had warned that we are getting close to the kind of land and water shortage East Asian societies like China, Japan, and Korea have grappled with, but have built up institutions through the centuries to cope. I had argued that we need to hasten. We would (we hoped) harvest water and improve irrigation deliveries.

More concretely, I would suggest that we introduce a quantitative planning cell in one of the ICAR institutions with expertise in agriculture and resource development. Our planning work must have a sustainability concern for medium- and long-term strategies, which needs to be worked out. Such work will require coordination with other sectors, like rural–

urban linkages, and demographic and gender concerns, but in this work, agricultural science workers must be in the driving seat. This exercise must be compatible with global developments and must be set in that framework.

Conclusions

The planning function cannot be eliminated, and for a country at India's stage of development in a world economy that is rapidly changing, the planning function will only grow in importance. As knowledge workers you must be there.

Notice I am not listing you tasks but the challenges. Quantum jumps must be faced. Avoiding severe water shortages, improvements in irrigation efficiency, and cropping intensity will have to be much faster. Bad coal of over a billion tonnes will not [need] to be burnt if alternative energy life and management styles are implemented and hydel and nuclear plants completed, in addition to a major focus on renewables.

Keeping reasonable limits on slum growth will need a strategy of decentralized rural–urban linkages. Modern technology will have to be integrated with agricultural populations so that the benefits of national and global markets can percolate to the workforce. Trade and globalisation will have to grapple with these questions.

If these kinds of links cannot be established in concrete terms, the concept of an enduring future will remain an empty box. If communities are out of balance with their resource endowments, there can be no question of significant advance in the areas of global concern like climate change, carbon sequestration, or biodiversity. As India takes its place in the sun in this century as a major global entity, it does so with a high rate of growth and a young, restless population on the move. Very little can hold it back. But water and other non-renewable resources like land will set the eventual limits of high growth.

Despite all the hiccups and the fact that in some regions we are already very stressed, I believe we have the civilizational and—given our federal democracy—our institutional strength to use resources well. A group I chaired underlined the need to give our people [the] legal right to drinking water and create a legal structure for water accounting and planning, beginning with local aquifers, going into river basins and integrated with agro-climatic plans. The centre has the major role of preparing a water resources information system for this and a framework legislation for supporting the states and local bodies in state-of-the-art project and planning techniques. It is not enough to talk of interlinking. We must start local and go up to the river basin in a practical manner.

Notice all the arguments I am making in this speech are based on many activities outside the agricultural sector. At least I hope I have made you think afresh on the subject of reviving the planning function and the role of agricultural, water, and soil experts in the process.

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