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19 January 2013

Introduction

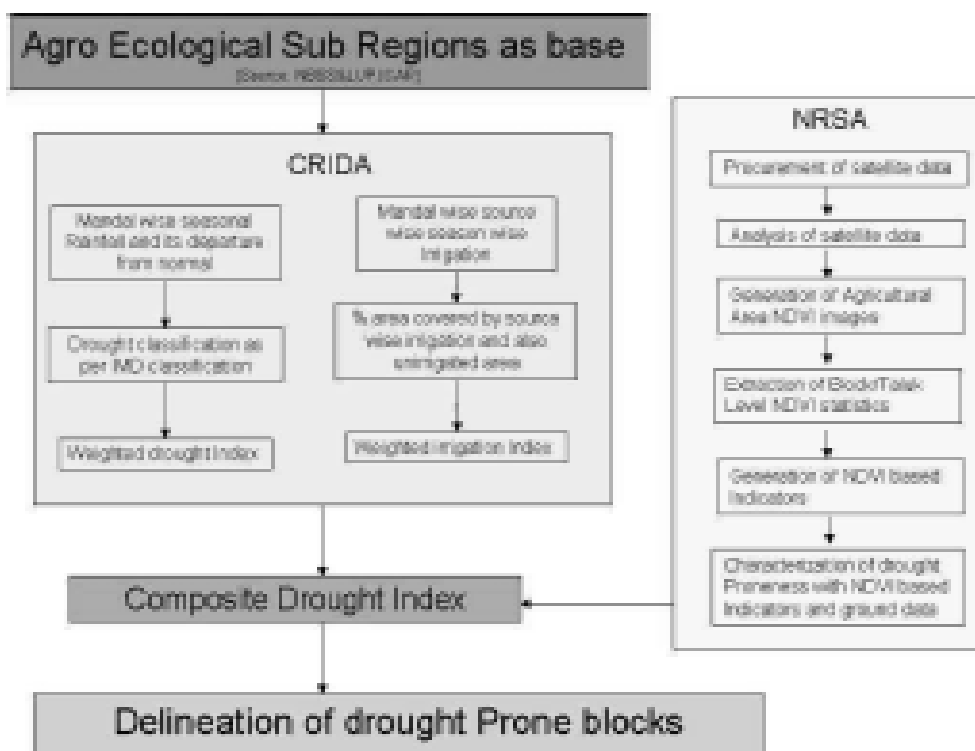
I am indeed very happy to come to this civilized town. I was here as a guest of Shri Pratap Rao Pawar for the Fiftieth Anniversary of Sakal and have very fond memories of that cultural and intellectual extra vaganza and of music, dance, speeches, farm and small factory visits and of course red and yellow kolhapuri curries, bhakris and modaks. Since then India and I am sure Kolhapur have traveled a long way on growth and globalization. I believe that a strong domestic foundation is the only sure way to negotiate the world. The global bazaar can be a great hand maiden but also a cruel mistress. It all depends on what you bring to the table.

A prosperous agriculture links with the growth of agro based towns in what I have called the Rural Urban Continuum (Y. K. Alagh, 2012) and so I will talk of growing sustainably when the rain gods are not always kind, of institutions and infrastructure to do that well and connect with bazaars. I will talk of incomes and jobs and above all of technology and education and skills. When I was here the last time we had an agro climatic plan for the Deccan agroclimatic regions. It was initiated by a leader who was an inspiration for both Satyen (Sam) Pitroda and me; the Late Rajiv Gandhi. In essence the concept that agriculture should develop based on the endowments of that region and then trade, is correct now just as it was then. But opportunities and problems are different and we will briefly look into all that in a Then/Now mode.

Land and Water

The relevance of agro-climatic planning to dryland areas is well known and as its granddaddy I won't repeat it. It was felt then that 'The extent of problems faced by cultivators in different rainfed areas across the zones vary widely. Erratic rainfall, leading to high production risks, low adoption of new technology, serious problems of soil degradation are some common constraints. The major ailments

suffered by land are denudation and erosion resulting in loss of top soil through action of wind and water as well as water logging.’ (Annex 1 gives the details for different regions). We have gone a long way since then. It is now possible to use satellite imagery, Google Earth and hand helds to determine relatively quickly the vulnerability of the land and water context. The Report of the Planning Commission Working Group on Dryland Areas of the Eleventh Plan which I chaired and Mihir Shah now Member, Planning Commission did all the work for suggests new methods of utilising remote sensing data from NRSA to develop a Normalised Difference Vegetation Index (NDVI) for each block, to validate the composite drought index.(See Annex1 for details). A National Agricultural Drought Assessment and Monitoring System (NADAMS) will be a remote sensing based agricultural drought monitoring mechanism in India and providing near real-time information on the prevalence, severity level and persistence of agricultural drought at national/ state/district level. The methodology is shown in the following figure



To me the more exciting aspect is that decentralized methods are now possible to supplement larger planning studies done say at the District level by individual experts using hand held computers, soil and water regimes both above the surface and below it, vegetative cover and state of growth, to provide real time assistance to the farmer. I would recommend PPP type of projects at a University like Shivaji University with public and private extension and consulting agencies and companies and agricultural universities to design models to provide advisory services for getting the most from the land resources and available water of the region. A recent exercise done by TERI which I chaired is an example of such efforts (TERI, 2005).

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satellites is used to show the farmer falling water levels and s(he) regulates use.(Planning Commission,2012) But it is a beginning and we need a lot else in the distressed ground water areas, as I am arguing above. On land we want largely a land market with the State playing a marginal role to take care of the small group who would stop a social project (ten to fifteen percent land acquisition at most). That was a *reform package* but the Empire hit back and made the ten percent forty percent. Now Ms. Gandhi, the present one, has come to our rescue but it would be naïve to think that with our voracious hunger for land and minerals, the problems of the declining land base of Indian agriculture are behind us. A land market needs title to land and land records have not been fixed in all States. If we are wiser than we have shown ourselves to be, it will take five to seven years to improve the soil and water story.

Technology

Technology is going to be the kingpin of solutions, since the high rate of capital formation is not leading to a commensurate increase in agricultural growth. Groups pushing technology should be in the drivers seats and that should be a hot seat with performance markers. Since the land base has stopped growing, productivity growth will have to be much higher. At the request of the present author, a Indian Statistical Institute team (Rabin Mukherji, et.al.,2001) worked out that the past growth of productivity in agriculture was 1.62% annual in the decade 1981-90 and 1.55 % annual in the decade 1991-2000. This growth will have to be 1.72 to 2.08% annual in the period 2001-2020 if agriculture grows at roughly 3.5 to 4% annual and 1.9 to 2.5% annual if agriculture grows at 3.8 to 4.8% annual in the period 01-20. Thus to source higher growth factor productivity will have to rise at least by a third, which is difficult in agriculture.

The seed economy is critical to India's development. The reasons are many. Apart from a few projects, canal irrigation is expanding slowly and is concentrated only in select areas. Ground-water use is under stress. Cropped area is at best constant. A slowly growing agriculture, at 3 per cent a year at the outside, is constraining the sustainability of economy's level 8 per cent growth. In such a situation, seeds, nutrients and crop protection are the main sources of growth.

Our seed systems are honed for cereals and we are particularly good in self-pollinated crops - first wheat and now paddy. But, here, the next round

India is too big for the world to feed its growth and we can only use trade to adjust at the margin. The department of agriculture has on its website and pulses portal given some details of an excellent pulses development program, to raise yield to, say, 12 to 15 quintals per hectare as strongly endorsed by an Expert Group I chaired on pulses. William Dar, the director-general of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), has recently endorsed this - for the development, in different agro-climatic regions where pulses are grown, of seeds with the highest yields in the world, which are above two tonnes per hectare. If we get on the drawing board now, it would take four to five years. We need such strategies for many crops, in the PPP mode(Y. K. Alagh and M.Khullar.,2012).

To meet such needs, both money and mobilization of scarce technical talent are required. We also need great management and organizational abilities to cover the last mile in a long-haul problem. Sometimes we despair but we have to constantly remind ourselves that when we set clear goals, commit resources and persevere, our systems perform. Since entry costs are high, this is probably not a highly competitive industry. Since product obsolescence too is high, the public-private partnership (PPP) mould is probably very effective. The hybrid paddy project was being developed two decades ago, but it failed because of lack of perseverance once the technology was jointly developed by public-sector groups like the seed corporations and companies like Indo American Hybrid Seeds, Lever and so on. Recently, the Sadguru Foundation

has reported that tribal farmers are taking to hybrid maize that gives yields up to two and a half tones per hectare. Under Project Sunshine in Gujarat, seeds developed by an MNC were distributed at subsidized rates to tribal farmers.

Given the long-term nature of the problem and the fact that large investment is needed to develop new molecules, a degree of regulation will be needed. Investors need. Reasonable assurance of returns or they will not commit financial and, more importantly, experienced managerial and technical resources. For pulses itself for example the research plan will cost hundreds of crores of rupees, if the experience of hybrid paddy is any indication. For example a chipper machine which is a proprietary technology can shorten phenotype selection by half the time it now takes is needed but will be very costly. Technology is moving very fast. Such PPP projects will need high public-resource commitments in terms of meeting the so-called viability gaps.

A detailed plan that I have prepared sees a major role of areas in Maharashtra in the Deccan for this future work. The Expert Group on Pulses I chaired says that “With some difficulty the Group has been able to isolate around **9 million ha** in identified

Districts where **watershed** development in recent years gives scope for pushing pulses

development) are identified” (Y.k.Alagh and M.Khullar, GOI,2012 ;these are listed in the report include the region we are discussing). Great scope is also seen for intercropping, including :

Pigeon pea with soya: or with pearl millet /sorghum;

Urad, mung and cowpea with groundnut/ sorghum or pearl millet:

Cowpea/mung/urad with sugarcane and or cotton;

The policies identified are (i) technology; go to 12 qtls/hectare now and build a road map for twenty quintals/hectare as in Canada and Australia(ii) an efficiency rewarding pricing strategy (iii) technological and marketing infrastructure.

Hybrids in pigeon pea and chick pea and transgenerics have to be worked on.

Regional Policies and Infrastructure

The 2011 Census has established that a substantial part of additional urbanization is in what are called 'Census Towns'. This phenomenon was there earlier but was not recognized as urbanization as it is in the 2011 Census. This author had established in the middle part of the last decade that there were what we called 'large villages' which met the Census criteria of towns which were not classified as urban areas by the Government. This led to a pessimistic perception of urbanization. We argued then 'that a part of this pessimistic perception may arise from settlements which are "urban" by Census definitions not being classified as "urban". While the absolute differences on this account may be small, since population projections use first difference methods, "small" absolute differences can lead to "large" first differences and may affect the projections seriously. For Gujarat if a proper classification was made of the 'villages' that were not rural according to the census definition, but were not classified as towns, the first difference doubled. Thus the rate of change in urbanization would be twice that planned; a serious matter.(Y.K.Alagh,2007, pp.307.) Earlier land use studies found little effect of urbanization on land use. For example decadal release of land for urbanization was generally less than 5%.This is no longer true.

The Census Towns is a pan Indian phenomenon as the Census 2011 shows. Statutory Towns increased from 2001 to 2011 by 242, but Census Towns

by 2532. But policy does not think so. The chapter on rural transformation in the Approach to the Twelfth Plan begins by saying that ‘The Census of 2011 estimates that 833 million people continue to live in rural India.’(Government of India,2011) But until very recently the Planning Commission, ignoring Census towns was projecting that 870 million persons would live in Rural India in 2011(Government of India,2008). The Planning Commission has finally changed its earlier figures on urban population in 2011 of 357.95 million to the Census 2011 figure of 377.11 million(missing out 2 crore persons) and in the Approach Paper note the phenomenon of Census Towns but its projections for the future are sadly as earlier. They underestimated the rural population moving to small (Census, not official) towns by 37 million people. That is a lot of people and for an Approach titled ‘inclusive growth’ a critical slip up. As compared to an existing population of 377 million, the projection of 405 million in 2017(Government of India, 2006) is grossly low. An earlier scheme for small towns was dropped in the Plan. The JNURM does not cover Census Towns. PPP models are not the answer for them for CRISIL studies show that very small towns cannot service the charges for private investment in urban infrastructure in small towns. Actually problems arise when we get out of the metros. We have to get back to the drawing board. Planning Commission’s projection is 600 mn. urban In 2030 which is a gross underestimate(See papers by Y.K.Alagh, 2012: IJAE,IEJ for alternate projections).

Institutions

There is a need to have a cafeteria of institutions to involve the farmer as a stakeholder in the growth process. Copoeratives and self help groups are well known in terms of potential and problems and attempts at reform in the recent phase. There are now problems arising out of the treatment of Producers’ Companies in the proposed Companies bill legislation. Apparently the present

position is that the second amendment to the Companies Act in 2002 which introduced Producers' Companies is relegated to a position that the existing legislation will continue until a fresh one is brought into position. This introduces needless uncertainty in an institution which was doing reasonably well.

A few years ago based on recommendations of the Irani Committee, the Chambers of Commerce had suggested that the provision for Producers' Companies be dropped. A number of industrial and non-governmental organizations which had set up Producers' Companies were disturbed at those and had approached me. I had written to the Prime Minister and he was kind enough to send me a letter saying that the legislation would not be dropped and that he was writing to the then Minister of Corporate Affairs to that effect. Subsequently, to that the Ministry had also confirmed this position.

The different groups which are supporters of this legislation had called a meeting which they had asked me to Chair and this letter from the Prime Minister was tabled by me to give them the assurance that it contained. That meeting set up a Civil Society Committee under Shri Nitin Desai, Former Under-Secretary General of the UN to monitor this aspect and submit a report on the legislation. The Committee did submit a report which made a number of useful suggestions on strengthening the Producers' Companies, particularly streamlining the process of registration by the Registrar of Companies at the State level.

A number of corporate entities have now used this model. These include the Haryana Project of DCM which is a Harvard Business School case and the strategic business plans of Companies in agro-based industries, like Rallis and Tata Chemicals. I understand that the plans for the re-visioning of NABARD include a section on Producers' Companies and provides a mechanism

for including newer financial products in different agro climatic regions. The National Dairy Development Plan states that Producer Companies and Self Help groups will be the institutions to operationalize the Plan. The sooner this uncertainty is removed the better it will be.

Conclusion

Maharashtra is not an exception to the larger trends at work and I would suggest that the University makes a serious effort to study these phenomenon and draw planning and policy implications from them. I have the Census 2011 figures with me but I am not talking of them because we should get back to the drawing board and anyway the Census is three years old. Similarly for the rural urban continuum and newer institutions. If we do this I have no doubt that our agriculture will meet the requirements of food security and rapidly diversify itself. It will function in a rural urban continuum, with rapid developments of markets and shifting of working populations from villages to linked small towns and also from crop production to value added activities. The neglect of recognition of census towns shows glaring gaps in our understanding. With such gaps in our understanding and infrastructure planning, there will be rising food prices chasing few goods and immiserisation. On the other hand if newer institutions develop or existing ones take the responsibility, employment growth will be high in these activities chasing a high rate of economic growth. All this will happen if the institutional structure gives the appropriate signals in term of technology and organizational support and the necessary economic support in terms of pricing and infrastructure support.

On that happy note, I wish each one of you a great career in this great country. Stand tall and be proud of being an Indian.

Thank You and Jai Hind.

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Annex 1

Soil and Water Problems in Dryland Agro Climatic Zones

Particulars	VII	VIII	IX	X	XIII	Total
Geographical area (lakh ha.)	395	370	331	395	196	1687
Area needing soil/water conservation measures (% of geog area)	158 (40)	128 (34)	132 (40)	158 (40)	107 (54)	683 (40)
	V	VII	XI	XII	XIII	Total
Estimated area under problem soil (lakh ha)	9.91	95.32	4.32	0.37	8.2	118.02

1. Source; Y.K.Alagh,et.al., (1989), Agro-Climatic Regional Planning - An Overview, Planning
 Commission,New Delhi.

On Drought Measurement and Amelioration and Use of NRSA Estimates

Table 8**Weightage for Sources of Irrigation**

Source of irrigation	Weightage marks
Canal	2
Lift	8
Rainfed	20
Total	30
Source : PC	

The percentage of irrigated/rainfed area of the total block is multiplied with the weightage factor to get weighted irrigation index. This index is calculated for all blocks. Higher the value of irrigation index, the more drought-prone the block will be.

These two indices are then combined to get a composite drought index. The weights given to the two indices are not the same. (Table 9).

Table 9**Weightage of Drought and Irrigation Indices**

Indices	Weightage marks
Weighted Drought Index	70
Weighted Irrigation Index	30

Based on these weightage factors the composite drought index is estimated.

$$Y = 0.70X_1 + 0.30X_2$$

The higher the value of the composite drought index, the more drought-prone the block will be. Using this approach, drought vulnerability can be delineated at the block level and appropriate strategies could be visualised.

Is this an advance? I think it is. But we should discuss. The one addition I would suggest is to include The number of waterings, which we used for SSP planning as an additional indicator (See Y.K.Alagh, et.al., 2006)

Mihir Shah and PC have recently suggested that generalising this approach by including other bio-climates and their respective weights and ranges for rainfall deviation and irrigated area, the AESR approach to agro-climatic planning could be considerably strengthened. This approach would enable us to identify highly vulnerable segments at a block level within an AESR for which suitable land use packages need to be implemented to reduce drought vulnerability.

