K R Datye: Visionary of a Sustainable and Equitable Future

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K R Datye, a civil engineer by profession, worked for more than half a century on ideas for the water, energy and infrastructure sectors, ideas that were based on a vision for India of a sustainable, equitable and a democratic agro-industrial society. A critical appraisal of KRD’s work on his first death anniversary.

A year has gone by since K R Datye, KRD to his associates and friends, passed away on 28 September 2008 at the age of 83. A civil engineer by profession, he worked in and contributed to the water, energy and infrastructure sectors for more than 50 years and carried with him a vision of a sustainable, equitable, democratic agro-industrial society and a development pathway that led to it. No one could come in contact with him and escape being infected by his zest, his youthful energy.

A year before he died, when on a four-day field visit to the Polavaram project area in Andhra Pradesh, his child-like enthusiasm and curiosity were undiminished. No one thought then that this would be his last “fieldwork”, something he thoroughly enjoyed. Soon after, he was confined to his house, his health increasingly deteriorated, but not his enthusiasm.

Datye’s whole life revolved around his mission – strategising to translate his grand vision into a reality – to the point of becoming a 24-hour obsession. He was a man in a hurry – especially in the last few years – as probably he knew that time was running out for him. His radically different developmental strategy based on renewable bioenergy and dispersed industrialisation offers a pathway to a new society that emphasises equitable access to natural and productive resources, is ecologically sustainable, combines participatory and scientific methods and uses sophisticated and appropriate science and technology for a sustained improvement in the living standards of the people. Biomass and a regenerative eco-economy are central to his ideas, as are preferential rights of access, use and financing for the resource poor, including the women. Implicated are also new ideas about how to integrate education, people’s science and people’s movements into the developmental strategy.

He helped set up the Centre for Applied Systems Analysis in Development (CASAD), the Society for Promoting Participative Ecosystem Management (SOPPECOM) and the Society for the Advancement of Renewable Energy and Materials Technology (SARMET). He had a mutually enriching and educative association with many mass movements and civil society organisations including the Shramik Sanghatana, Bhoomi Sena, Mukti Sangharsh Movement, Narmada Bachao Andolan, Movement of the Nomadic Tribes, and various people’s science and women’s movements. For the movements it added or reinforced a new developmental dimension – the possibility of sustainable prosperity for all – to their vision of a radical social transformation and for KRD it provided a reality check for his ideas, helped in going beyond the noisied discourse and making them part of a larger agenda of social transformation.

In March 2008, months before he passed away, a two-day conference – “Towards a Prosperous, Sustainable and Equitable Future for All: A Critical Engagement” – at Tata Institute of Social Sciences, Mumbai, brought most of his associates from various fields to celebrate, revisit and critically look at his innovative ideas and contributions. On hindsight, it was a timely and fitting tribute. Through this brief note we too pay tribute to this visionary on his first death anniversary by revisiting some of the core ideas of his vision.

Complexity and Evolving Nature

KRD’s ideas and concepts about water, biomass, technology and so on continuously evolved and changed as he accumulated new experience and information. If this was his strength, the flip side was that by the time one came to grips with the details of a certain idea or concept of his, he had already moved ahead. For all those who worked or were associated with him, it was a constant struggle to “keep pace”!

Then there is the scale and range of his ideas. He was as comfortable talking about the root-zone moisture of crops and nutrient balance in the soil of small plots and micro-watershed development as he was in talking about basin and inter-basin transfers, or interstate water tribunals.

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His innovative ideas range from how to build a small check dam in a micro-watershed using local materials to how to restructure a mega project like the Sardar Sarovar Project.

Datye’s overall strategy – achieving sustainable prosperity for all – is composed of many components and elements built into a complex interdependent relationship. Concepts like sustainable productivity enhancement, regenerative use, equitable distribution, water rights and entitlements, democratisation and informed participation of users, technology choices, pricing, livelihoods of the resource poor are all part of this complex framework and normative concerns.

Moreover, KRD was a great borrower and synthesiser of ideas and concepts. He borrowed ideas freely and many of the experiences and ideas of Vilasrao Salunke’s Pani Panchayat, Balkrishna Renake’s experiments on small plot intensive cultivation (known more as lo guntha prayog), S A Dabholkar’s Prayog Parivar Network can be found in his thinking.

KRD was able to synthesise all these elements and integrate them on the basis of his vision to which we now turn. In what follows we attempt to capture some of this vision, the larger concepts and ideas which can help reorient the way we think about development and related issues.

**Regenerative Eco-Economy and Equity**

The two major strands in KRD’s thinking may be described as first, what he came to call, especially in the last couple of years, the regenerative eco-economy and second, equity. His stress on the regenerative eco-economy rather than the popular term “sustainability” emphasises a deeper process, a process that does not merely aim at conserving or protecting the ecosystem resources; but a process of renewal and improvement/growth of both the ecology and the economy. The second strand of his thinking was always the concern for the poor – dalits, landless, women, adivasis, artisans, nomads – basically all the propertyless and disadvantaged. It stems from his dual intellectual inheritance from Gandhi/Sarvodaya on the one hand and Marxism on the other. One may call him a neo-Gandhian influenced by Marx’s ideas or a neo-Gandhian influenced by Marx, it is difficult to say, and though we think it was the former that could be simply because we ourselves tilt that way.

KRD’s ability to counter the “There Is No Alternative” (TINA) syndrome was phenomenal. Invariably he managed to identify a possible alternative, not some distant utopian alternative, but a practicable one that could begin here, right now. This had much to do with his way of thinking; he never thought about the future, however utopian and distant it may seem, without linking it up with the present through some kind of vision about how to bring about a practical transition. For example, he was thoroughly convinced of a shift to organic agriculture in the long run, but he never advocated an immediate lock, stock and barrel shift. He saw that the time spans involved in building up the required productivity through a pure organic pathway would be too long and unacceptable to the resource poor. Sometimes his transitions looked too contrived, too complicated, but the important thing is the shape of his thinking: the insistence that whatever future one sees must be connected to the present through a well postulated transition.

He was also convinced that certain limited, but strategic use of chemical nutrients, used in conjunction with organic inputs would be required to build up the primary productivity, especially of degraded ecosystems. He advocated low external input sustainable agriculture as a transitional strategy. Convinced as he was of a shift to organic agriculture, he did not, however, see the issue as a “war”, chemical versus organic agriculture. It was the scale, type and context of chemical use that mattered. Used in the right way, at the right scale and in the right context chemical inputs could also be beneficial; the test was not whether the inputs were chemical or not, the test was how they affected primary productivity and regeneration.

He believed that many of the polarities dividing the development community were similarly one-sided, false dichotomies arising out of faulty thinking. For example, large and small, the external and internal inputs, environment versus livelihood were false dichotomies and the challenge was not to eliminate one or the other, but to bring them together in a synergistic manner. He valued the idea of the village republic and the gram sabha, but he did not ignore other forms. He recognised the limitations of the village community, especially in respect of the dalits and the landless, and he could also identify with Ambedkar’s call to leave the village “re-public” and go to the cities. He did not glorify-village and micro-level institutions and recognised the importance of the class, caste and gender disparities within them. Very early in his life he had reached the conviction that without the force of industrialisation and modern science, all that the village institutions would do is glorify tradition and poverty. For this same reason, he did not seek an absolute curtailment of needs, did not glorify austerity and advocated a standard of minimum comforts that went beyond subsistence needs. What he was looking for was not a return to the past village republics, but a transition to a dispersed agro-industrial society that would provide a sustainable prosperity for all. And water and biomass were the key to this transition.

**Water as the Starting Point**

For KRD, dispersed and equitable access to water was not simply expansion of irrigation. It had an ecological and social dimension and was the key to rural transformation. He supported the idea of providing a limited but assured quantity of water to all rural households irrespective of their landholding. To serve such dispersed need, the systems required had to be entirely different – technologically and socially. Ecologically, this dispersal meant the avoidance of irrigated “island” ecosystems, leading instead to an overall ecosystem enhancement and regeneration. The social dimension, especially the delinking of access to water from access to land was even more important. He supported and took this idea from Vilasrao and the Pani Panchayat and developed it further in interaction with the south Maharashtra movement for equitable water distribution. KRD always acknowledged the weakness of land reform in India as a major reason for rural poverty and he saw in this delinking a way of getting around it. Land that had water represented a productive force many times that of land alone.
Minimum assurance of water irrespective of landholding, along with novel ways of access to wasteland and small plots for the landless, were for him ways of redistributing rural productive forces and providing livelihood assurance, of going towards completing a task that land reform had not.

**Biomass**

Water was crucial, but in the light of enhancing the production of biomass – the total dry mass of living (in some contexts vegetative) matter – produced in the eco-system. Biomass includes not only perishable consumer items like food, fruits, vegetables and meat but also non-perishables like wood, bamboo, fibre, resin with the capacity of becoming industrial inputs. The transition to a dispersed agro-industrial society and the regenerative eco-economy he had in mind depended crucially on biomass production and use, how much and of what kind.

The first objective was to enhance the regenerative productive potential of the ecosystem and meet as many livelihood needs in kind as possible and create a biomass surplus for exchange of goods and services required to fulfil the rest. With dispersed and equitable access to water within the ecosystem, he postulated that it is possible to generate a surplus of three tonnes of biomass per family after meeting needs of food, fuel, fodder and recyclable biomass, a postulate that he continuously tested against incoming information.

In his vision, this biomass surplus is crucial. It does not comprise raw materials or perishables to be sold. He sees it in a form suitable as input for local dispersed industry in which it is processed; adding value and energy, and the product in turn is also an energy replacing industrial and infrastructure input to the larger system. It is this that opens up a new path to dispersed, rural industrialisation with great value addition potential broadening the livelihood options of the rural poor.

In his vision, the aggregate ecosystem biomass production potential is a social productive force that the state has to help sustain, regenerate and enhance and as importantly, provide equitable and preferential access to it for the poor and the propertyless. While one portion went to fulfill needs in kind, he saw the surplus being made available for livelihood enhancement to the landless and rural poor and women now turned artisans or their associations. He was always thinking up social and economic devices to bring this about. He believed that without such a pathway to dispersed industrialisation for the rural areas all that one could offer the rural poor was rural stagnation or urban slums.

**Biomass as a Source of Energy**

For **KRD**, in the larger scheme of things, biomass represented a store of renewable energy while land, water and other ecosystem resources were means to harnessing it in a benign form. Every use of biomass in which it replaced, and therefore saved, non-renewable energy or materials then represented an energy saving which he assessed through an index that he called the energy multiplier, which represented the total amount of non-renewable coal energy saved per unit of biomass used. His aim then was to maximise the energy multiplier of biomass use. Different kinds of biomass use give different kinds of multipliers: as fuel, it saves roughly as much coal as its weight, a multiplier of around one; as construction material it saves roughly three times as much coal as its weight, a multiplier of around three; and as a chemical derivative replacing petroleum derived intermediates it possibly had the largest multiplier saving, roughly five times as much coal as its weight, a multiplier of about five.

However, **KRD**’s ideas differ radically from the discourse of mainstream advocates of biomass energy. A case in point is that of the discussion on biofuels, often reduced to jatropha and bio-ethanol that gets embroiled in the “food vs oil” controversy. In contrast, in **KRD**’s thinking there must be assured applied water to crop land on a priority basis. His biofuels are produced as biomass surplus, after providing for local food, fodder, shelter, and recycling throughput needs are met in kind. Biomass is for him, food and “oil”, and in that order.

**Technology and Energy**

Dispersed biomass-based industry is all very well, but only if there is a strong line of potential biomass-based products that fulfils all these prescriptions. Here we will have to turn to **KRD**’s work and his thinking as a technologist and they are equally important. The first component of this thinking is design optimisation, especially materials, by function, that opens up the potential for biomass products.

He had a quick eye for synergising components and materials. For example, most of his composites were based on utilising cement/concrete for compression, wood/bamboo/fibre for tension and steel and such material for load/shear transfer. His concept of sandwich filters actually takes the weaknesses of some of the materials and turns them into their strengths. This design philosophy opens up a very large range of biomass-based construction products as infrastructural or developmental inputs which are described in his book *Banking on Biomass*.

His refusal of binary polarities is also at play here. He does not aim at complete elimination of non-natural or non-renewable materials; they are restricted to a few vital functions they may perform best. Nor does he eliminate the larger system and reduce everything to dispersed industry. He views the output of centralised industry as something like a common resource with all decentralised/dispersed units having a right to strategic quantities of that output. These strategic quantities of industrial outputs, or more specifically non-renewable materials, were required to give backbone, strength or stability to the design at a conceptual as well as at a systemic level.

The energy options he advocated also followed these synergistic patterns. For example, he shunned the large, capital intensive control systems and huge investments in solar energy. He was prepared to sacrifice some efficiency for easier access of skills and robustness and aimed at delivering heat at an equivalent cost rather than final power. The wind hydro hybrid systems or the larger cascades of low head and high throughput mini-hydro plants that he proposed are examples of this type. These ideas also extend to energy system planning in which different sources come into prominence at different times according to their seasonal strengths/availability – hydro in monsoon and post-monsoon, solar and wind in the spring and summer and thermal power in the short winter.
The other important aspect that he emphasised – right from the days when it was not very popular to do so – was that materials represent energy too and materials use is also energy use. He thought there was a much greater energy saving potential by saving of materials use through a materials efficient design, especially designs based on synergising properties and functions (as seen above) to reduce the use of non-renewable materials. In his view it was possible to simply bring about a reduction in materials energy use by a factor of five by the use such designs. And it is here that biomass applications played a crucial role.

For KRD, technology choice was important, especially in the transition to a dispersed, prosperous, agro-industrial society. He sought to develop technologies that (1) matched functional performance of conventional technologies, (2) had comparable costs and high proportion of expenditure on local materials and labour, (3) saved non renewable energy and material consumption by a factor of three to five, (4) were modular so that the various components could be manufactured at independent workplaces, and (5) provided opportunities for local skill upgradation and development.

Resource Assessment, Literacy and Education

The technologies he visualised were related to another aspect of his thinking, that visualised the landless, the rural poor and women turning into artisans and “bare-foot” technologists. His ideas on learning and earning were deeply rooted in Gandhian as well in some Marxist thinking. He looked upon developmental activity or participation in production itself as a kind of a school. He envisaged the marriage of traditional and modern knowledge through the learning that developmental activity would itself create.

He firmly believed that ecosystem resources had to be studied and assessed by ecosystem users in order to devise optimal regenerative strategies for the development of ecosystem productivity and the realisation of ecosystem productive potential. This led, on the one hand, to a whole series of activities around participative resource assessment and planning of ecosystem resources. This is an entire area in itself mobilising the most sophisticated instruments like Remote Sensing-Geographical Information System (rs-gis) to the simplest instruments like a sketch or markings on cadastral maps.

Some of his most enthusiastic efforts were directed at inducting rural youth into a learning and earning activity through induction into this process, firstly through the resource assessment process and then through the self-help groups (SHGs) and biomass processing group activities. He believed in the concept of continuing education and the local Industrial Training Institutes (irris) formed a major link in his strategy for learning even while being involved in productive activities.

Cost Recovery and Subsidies

KRD also believed that a fresh approach to economic and financial instruments like tariffs and subsidies was important in bringing about the transition. He advocated tariffs (for water and power mainly, but the principle is more widely applicable) that clearly distinguished between a basic service and an economic service. Basic service could be termed a “rights” component and has to be provided on a priority basis to all at an affordable cost, as part of the basic right to livelihood. Economic service provided after meeting the basic service is then for entrepreneurial or profit-making activity. He saw graded tariffs with different tiers, tied to affordability and to full cost recovery respectively, as ensuring this distinction. For example, he would recommend that basic service costs should be restricted at most to operation and maintenance (o&m) costs while economic service costs should additionally cover part of the capital costs as well and progressively move towards a full cost recovery over a sufficient time span.

KRD never got on to the neoliberal subsidy hatav (removal) bandwagon. He maintained that subsidies were necessary; but he made a distinction between current subsidies aimed at subsidising current costs versus one-time subsidies aimed at creating assets or productive potential. He advocated elimination of the former and strengthening of the latter because they would then largely reduce, if not eliminate, the need for future subsidies.

He also made a distinction between developmental expenses that covered local labour and income generating inputs versus non-local inputs. He advocated subsidies for the local input – his argument was that the expenditure should be seen as investment on social development and livelihood assurance which the state would anyway have had to undertake for those very people in the absence of the subsidy. In fact, he argued for introduction of the National Rural Employment Guarantee Act and demanded that it cover these aspects. For the non-local inputs, he advocated concessional finance for the renewable inputs and full financial terms for the conventional items. These arguments he would later also extend to what should qualify for carbon credit trading, advocating carbon credits for local and renewable development inputs that were part of a regenerative eco-economy.

These ideas have to be seen in the context of the technology he proposed, which favoured local renewable materials and labour against external input-intensive conventional technology. The biomass-based approach and the proposed technologies have the potential to bring down recoveries to affordable levels and dedicate subsidies towards the production of productive and durable assets.

Reorienting Institutions

KRD’s institutional thinking also was geared to bringing about this transition to an equitable and just, dispersed agro-industrial society. One of his major limitations was a fetish for developing ideas on how social relations could be engineered to fit them into his broader paradigm. Hours of work were spent in seeing what social arrangements would work best in different scenarios. From gram sabhas, SHGs, to leasing and joint stock companies KRD struggled with his ideas around institutions. Some worked and some simply did not.

Among his ideas was his diligent advocacy of biomass banks as important instruments to rise above the constraints placed by the decentralisation of SHGs and the disadvantages of scale of individual artisans, or even individual micro-watershed/hamlet/village. Biomass banks would buy biomass from producers, lend it to
Artisans for processing and buy back their biomass product. In this sense they were different from the other banks like grain banks and fodder banks: first, they were not primarily consumptive but productive pools of biomass; second, they did not only have risk pooling functions, but also had the function of socialising individual working capital costs for artisans and biomass producers.

Another idea of his was that of leasing companies, for example, for the solar equipment that would be produced, so that unlike a product which transfers the responsibilities of maintenance and up-keep automatically on to the customer, it would retain the responsibility of upkeep and factor that into the lease terms. This is important when we are dealing with a dispersed model in which the product may be in the hands of groups who do not have the necessary skills and abilities to look after the upkeep of the equipment.

Datye made an important distinction between the institutions required for management versus those required for governance, though he himself did not sometimes follow it. Even granting that every social act is in some sense political as well as economic, he distinguished institutions that largely carried out political functions (like deciding matters directly political and those on allocation and/or entitlements/ rights to resources, pricing, and the like) and those that carried out management functions (management of resources, service delivery and the like). In our opinion he was much stronger on the latter and his most important innovations were related to that aspect. His emphasis on SROs is very much related to this argument. He found them to be effective management units, of a small enough size to create cooperative binding and learning which was so very essential to his thinking.

Datye's thinking on institutions was perhaps the weakest like in his vision. He was too quick in proposing institutional forms as institutional solutions. While the resource and technical balances for the transition are meticulously worked out, there are too many “components” requiring too demanding a “close fit”. The social transition begins to look too much like a mechanism and a systemic assemblage, and social change begins to look too much like social engineering. Social change rarely happens in a linear manner and it does not respect the kind of close fit between different social processes that he demanded. He was indeed aware of this difficulty, but was prone to brush it aside. He believed that once his ideas were accepted at different levels – by policymakers, by funders, by mass movements – they would find ways and means of dealing with these niggling problems.

A New Optimism

KRD's vision thus offers us the possibility of an equitable and regenerative prosperity, not as an island and not as a distant utopian future, but as an immediate mainstream possibility. In doing so it departs radically from his sources of inspiration. Unlike conventional ruralist and Gandhian thinking it does not see local ecosystems mainly as raw materials or subsistence goods producers. Unlike typical environmentalist thinking it does not stop at conservation and incorporates industrial production into a dispersed ecologically regenerative system. Nor does it demand accumulation by dispossession – of either the capitalist or the so-called socialist kind – of the vast masses of the rural poor as a necessary concomitant of development.

It offers a positive sum pathway to broad-basing sustainable development by integrating regenerative development of the productive forces with the redistribution and socialisation of this new productive potential carrying it forward to a society that promises more than subsistence for all. This is one of the core ideas of KRD that attracted many radical groups and toiling people's movements to his thinking. Development sector practitioners, activists, academics, civil society organisations, policymakers, donor agencies and various government institutions and departments have over the last few decades witnessed, experienced or been touched by KRD's contributions to various fields. It would not be an exaggeration to say that he had been able to change the thinking and mindsets of all those who came in contact with him.

Datye's vision engages with almost all sectors and facets of development including water, energy, materials, infrastructure, institutions, policy, finance and credits, resource literacy and people's science, gender, empowerment and so on. However, his multidosed genius, and wide-ranging thinking have gone largely unnoticed and unacknowledged. And for a variety of reasons, his innovative concepts and ideas could not be developed fully and grounded in an integrated manner. It is time we changed that. In view of the developmental trajectory that India is pursuing, the “crisis” many of these sectors are facing today and the large-scale dispossession of the resource poor that is taking place, we feel there is an urgent need to engage with some of KRD's ideas, concepts and innovations and re-articulate a broad alternative developmental trajectory. That would be a fitting homage to him.4

Notes

1 The Forum for Policy Dialogue on Water Conflicts in India had set up a three-member committee consisting of K R Datye, Sudarshan Iyengar and R Parthasarathy to look into the controversial Polavaram dam issue.

2 The two-day conference organised at Tata Institute of Social Sciences (TISS), Mumbai, on 28-29 March 2008 brought together nearly 80 people from all over India. The papers and presentations at this conference are available at http://www. regendev.org/Conference.html. Atul Pethe's documentary on Datye – K R Datye: Exploring Energy Pathways – was released and screened at the conference. It can be found at http://video.google. com/video?docid=-668479707063464868; For a copy of the CD/DVD contact atul_pethe@ hotmail.com

3 The attempt here is to only outline some of Datye's core ideas and concerns as it is rather difficult to give a full exposition of his vision and strategy in this brief note. Datye's vision is to a very large extent already captured in the book Banking on Biomass (K R Datye assisted by Suhas Paranjape and K J Joy), 1997; Banking on Biomass: A New Strategy for Sustainable Prosperity Based on Renewable Energy and Dispersed Industrialisation (Ahmedabad: Centre for Environment Education) and in many of the notes and papers that he has authored and co-authored over the years.

4 After KRD passed away, most of his close associates, especially those who had been involved with him in his various experiments, have been meeting regularly at his residence to take some of these ideas forward. All those who want to get connected with this effort can contact Ujjwala Pendse (ujjwalapendse@gmail.com), Vilas Gore (vn_gore@yahoo.com), Ulhas Gore (ulhas_gore@yahoo.co.in) or any one of us at SOPPECOM (soppecom@gmail.com).