

headache, heart disease, high blood pressure, high cholesterol to menopause, multiple sclerosis, warts, wrinkles and yeast infections. Each condition is alphabetically arranged and apart from description of the herbal remedies, Duke provides his own special recipes in each chapter. The text is interspersed with highly fascinating anecdotes based on his own experience as well as his discussion/dialogue with other experts. Illustrations of plants done efficiently by Peggy Duke are an added attraction. Part One gives a useful, step-by-step guide to the newcomer, helping to build one's own green pharmacy through simple and clear instructions.

Authentic scientific database built by Duke provides useful information cited in the text, which enriches its value. However, I am surprised that the book is totally bereft of references or bibliography of published results. While many anecdotes included in the book and opinions of individual authorities may not call for support by references to published literature, this cannot apply to the scientific data included, such as results of research published from different parts of the world (e.g. p. 28, study on garlic for aging; Japanese as also Indian studies on gotukola; p. 35, studies on the effect of reishi in Chinese workers on altitude sickness; p. 92, Indian study on the effect of jasmine flower on lactation, etc.).

Despite this shortcoming, however, the book offers a delightful journey through ethnobotany and herbal recipes, enriched with loads of scientific information on the causes and physiological/pathological mechanisms of various health problems and a choice of herbal remedies, the methods of preparation offered in a most lucid manner.

The author's postscript on a 'Lifetime of loving plants' is absolutely delightful and reads almost like poetry. James Duke brings so much of his own personality and philosophy to this treasure house of knowledge and wisdom on herbal remedies. Duke also cautions the reader repeatedly that, as he is not a medical doctor but a botanist with expertise in herbal remedies, one should seek medical opinion for diagnosis of the disease (in all cases), and in certain cases even before starting the treatment (because of possible interactions with conventional drugs). The contraindications for several herbs (such as pregnancy, hepatic dysfunction, allergies) are clearly mentioned.

I would recommend this book to all those interested in herbal remedies, including the common man, health care providers, scientists, students and experts in herbal remedies. The book has something new and original for all these groups.

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Sustaining our Food Security. R. S. Paroda. Konark Publishers Pvt Ltd, A-149, Main Vikas Marg, Delhi 110 092. 2003. 775 pp. Price: Rs 1200.

This book contains the various lectures delivered by R. S. Paroda, during the period 1991–2001, particularly when he was Director General of the Indian Council of Agricultural Research. The book covers a wide spectrum of important topics relating to sustainable food security. Paroda has dealt with both technology and public policy. He has covered crop and animal husbandry, as well as fisheries and forestry. He has placed emphasis not only on crop productivity, but also on sustainability and profitability. He has suggested a way out of the fatigue of the green revolution currently being faced in several parts of the country, particularly in the northwest region which has been a major bread-basket of India. Paroda is an ardent advocate of a rainbow revolution comprising 'Green (crops), White (milk), Yellow (oil seeds

and pulses) and Blue (fish) revolutions'. This calls for a farming systems approach. It also requires capacity-building and human resource development at all levels. Paroda has therefore pleaded for a substantial increase in investment in agricultural research. Such investment also comes under the category of non-trade distorting support to agriculture under the WTO regulations.

I would like to highlight a few areas in the fields of conservation, commercialization and consumption among the topics covered in the book. The need for an action–reaction analysis with reference to all development activities has been stressed by many experts. B. F. Skinner, for example, once stated, 'Every new source from which man has increased his power on earth has been used to diminish the prospects of his successors. All his progress is being made at the expense of damage to the environment which he cannot repair and cannot foresee'.

With regard to conservation-based agriculture, Paroda has dealt with in detail strategies for the conservation, sustainable use and equitable sharing of benefits in relation to agrobiodiversity. Among the other areas he has referred to are integrated pest management (IPM) and integrated nutrient supply.

Scope exists for developing optimum blends of the following sources of nutrients for irrigated and rainfed rice-farming systems: *In situ* conservation of biomass in rice fields and control of grazing with the help of botanical pesticides like neem cake; Azolla application; straw incorporation; cultivation and incorporation of green manures and application of mineral fertilizers coupled with flood water management.

There is need for greater interaction among scientists working on the following components of IPM strategy: Genetic; biological; cultural; chemical; botanical pesticides and socio-economic.

Varietal development and recommendations should be for a cropping system and not just for one crop. The varieties recommended should be tailored to the pest problems of each growing season. Also, concepts like insect thresholds need careful field application, otherwise there could be problems of vector-borne diseases.

Basic studies such as the ecology of weeds and weed problems related to moisture availability as well as more detailed work on disease epidemiology are urgently needed. IPM should not mean putting

together on a paper a set of independent recommendations given by different scientists. IPM will be effective only if the component technologies are developed by agronomists, breeders, entomologists, plant pathologists and social scientists together.

In the past, land-use decisions were taken by farming families largely based on the home needs of the family and of the immediate neighbourhood. With the modernization of agriculture, farmers produce food grains and other commodities not only for themselves, but more importantly, for the market. When this transition takes place, opportunities for producer-oriented and remunerative marketing become essential for sustaining and stimulating farmers' interest in modern technology.

In domestic trade, both cost and quality influence consumer demand. In international trade, in addition to competitive cost and desirable quality, stability of supply becomes extremely important. If appropriate technologies and remunerative marketing opportunities co-exist, impressive production gains can be achieved, as our experience during the last 20 years shows. Under commercial agriculture, the old distinction between 'food and cash crops' vanishes and all crops become 'cash crops'. This is where government policies in the area of infrastructure development for improved post-harvest technology, marketing and transport as well as steps for ensuring fair returns to producers and reasonable prices to consumers become important. Most developing nations have to simultaneously improve production by small farmers and consumption by the rural and urban poor, and hence attention to policy formulation becomes crucial to success, particularly in the context of globalization of trade.

An area of great concern in post-harvest handling is grain drying. Many poor farmers have to dry their produce either on roads and/or roofs. Inadequate drying leads to problems of aflatoxin production resulting in liver ailments like hepatitis. There is much scope for developing grain dryers based on the use of renewable energy sources like sunlight, wind and biomass. Paroda has therefore laid considerable stress on achieving a proper match between production and post-harvest technologies.

With regard to consumption, we face two contrasting challenges. On the one

hand, the rural and urban poor suffer from under nutrition and malnutrition due to inadequate purchasing power. On the other hand, the food habits of the more affluent sector of the population are fast changing with greater emphasis on fruits, vegetables and animal products. We also witness the paradox of abundant grain reserves co-existing with millions of people suffering from under nutrition in our country. As early as 1861, Col. Baird Smith remarked that 'Indian famines are not famines of food but of work. Where there is work, there is money and where there is money there is food'. *If a famine of food was the major obsession in the immediate past, a famine of jobs or livelihood opportunities is currently the cause of endemic hunger.* Imaginative Food for Work programmes will help to mitigate the situation.

How can we help in adding a dimension of employment and income-generation to productivity improvement in the major farming systems? The following areas of research are relevant in this context: Income and nutrition orientation to farming and cropping systems research; improved post-harvest technology; biomass utilization and management aspects of decentralized production supported by key centralized services, e.g. organization of horticultural estates for integrated attention to production, processing and marketing.

It is obvious that the farm sector alone cannot absorb all the surplus landless labour in the rural areas. We have to give a new orientation to the concept of land reform and widen this concept to include all forms of asset reform. For example, one of the greatest assets in rural areas could be the intelligent and effective use of emerging technologies such as biotechnology and microelectronics. Unless steps are taken immediately to train rural women and men, particularly those belonging to landless labour families in relevant technologies, the poor will again be bypassed by the new technological opportunities. *In fact, rural development should be defined as the conversion of all unskilled persons into skilled ones.* It is only in this way that productivity can be enhanced and quality of life improved. Instead of just measuring 'yield gap', we should turn our attention now to the study and removal of the constraints responsible for 'knowledge gap' in rural professions.

Paroda has offered useful suggestions for bridging the knowledge divide. Science helps to advance the frontiers of knowledge, while science-based technology helps to advance the frontiers of production and thereby of national income. The same distinction is valid in the case of discipline-centred farm research and farming-systems research. However, on-going programmes in farming-systems research tend to suffer from two major drawbacks. First, the marketing aspects of the recommended multiple cropping sequences and mixed farming systems do not receive the same attention as the agronomic and production aspects. Secondly, the technologies which can lead to a reduction in the cost of production without reducing yields and which can help to improve farm incomes need for their success under small farm conditions, a blend of individual initiative, government support and group action in areas like soil and water management, soil, plant and animal health care and post-harvest technology. Therefore, we need to shift our emphasis in farming-systems research from an individual farm holding-based on-farm research to a group of small holdings using a watershed in the case of rainfed areas or a command area in the case of irrigated agriculture or a village as the unit for promoting group endeavour. Unless the marketing and group action components of farming-systems research receive more recognition and attention, the value of the large investments now being made in agriculture research will be limited.

Paroda's approach is best captured by the message contained in the following Persian poem.

'What you and I hear are different;
You hear the sound of closing doors,
But I of doors that open'.

This book is a must for all agricultural libraries. We are indebted to Paroda for this labour of love for Indian agricultural science and development.

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