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Indigenous Knowledge Applications for Livestock Care



Proceedings of a National Workshop

14 - 17 September, 2004

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14 - 17 September 2004**

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Preface

This document presents the proceedings of the workshop entitled **Indigenous Knowledge Applications for Livestock Care** held at the National Insurance Academy campus, Pune, from 14th to 17th September 2004. The purpose of the workshop was to share the findings of the IKAH¹ project with a larger group of veterinarians, scientists, academics, development workers and professionals. An equally important objective was to explore concerns and initiate debate on issues of intellectual property rights (IPRs), biodiversity and benefit sharing in the larger context of rapid globalization and privatization.

The workshop participants came from a wide range of disciplines and included veterinarians, botanists, researchers and academics/academicians, health practitioners, activists, management professionals and lawyers. Each presenter had a different style which is evident in the way the presentations have been included in these proceedings. In reporting the proceedings we have tried to maintain the logical continuity and structure of each presentation, and included the questions posed by other participants and the ensuing discussions. The original power point/overhead presentations are included in the appendixes.

These proceedings assume greater importance even as India has signed the Patents Bill and many critical acts and bills pertaining to people's rights over their natural resources, which are being fiercely debated at national and international levels. The workshop itself touched key areas of concern, namely the appropriateness and validation of indigenous knowledge, delivery of health care services, introduction of indigenous knowledge in the veterinary curriculum, and the burning issue of patents and IPRs. We sincerely hope readers will find the discussions interesting and explore these issues further in their own spheres of work.

¹ IKAH, Indigenous Knowledge in Animal Health was a project implemented by Anthra between the years 1996 –2002. The project was implemented in three districts each of the states of Maharashtra and Andhra Pradesh, and largely consisted of documenting, validating and disseminating the best and most valuable practices in the field of animal health care.

A welcome but unintended consequence of the workshop was the passing of a resolution urging the Veterinary Council of India to recommend certain changes in the curricula structure which would bridge the gap between university students, on one hand, and the owners of livestock, on the other. This marked the high point of the workshop as this issue was presented before the council of deans at their meeting in Pantnagar, Uttar Pradesh, on 25th September 2004.

The final session on medicine making was a practical session where people learnt and shared medicine-making techniques from each other. Healers, animal health workers, veterinarians, botanists, students and NGOs participated in this session. We have tried to share some of the experiences and thoughts from this session in the best way possible.

This workshop happened because of the support we received from various quarters and we gratefully acknowledge the contributions of Prof. Vinod Ahuja, Dr. Jayvir Anjaria, Dr. Chandana Barua, Dr. Bhamburkar, Ms. Shalini Bhutani, Mr. C. R. Bijoy, Mr. Vishwas Deviah, Dr. B. N. Dhawan, Prof. Madhav Gadgil, Dr. J. K. Malik, Ms. Philomena, Dr. Imrana Qadeer, Dr. Rama Kumar and Dr. D. Swaroop to the workshop sessions.

We are also extremely grateful to Dr. Anjaria, Mr. Vivek Broome, Dr. Sanjay Dakore, Mr. Pramod Pokharkar and Dr. Sadekar for their contributions to the medicine-making session; Dr. Mishra, Mr. Jog and others at NIA for their help, hospitality and the excellent services provided; Mr. Jagannath Majhi and Dr. Ramesh for help with the documentation.

Finally, we wish to express our gratitude to SDC, the Swiss Agency for Development and Cooperation, specifically Mr. Hermann Mulder, Mr. Felix Bachmann and Ms. Lucy Maarse for supporting the IKAH project, the workshop, and providing support for this publication.

Anthra Team

Introduction

Limited and expensive veterinary health care is a major cause of low productivity of livestock, especially in rural areas. Poor farmers and pastoralists are affected significantly, as they do not have the means to access expensive or sophisticated veterinary care. On the other hand, there is a vast repertoire of indigenous knowledge based on ethno-veterinary and management practices, which has the potential to address some of the health care problems on a local and low-cost basis.

The major objective of the workshop on **Indigenous Knowledge Applications for Livestock Care**, held in Pune in September 2004, was to share the research findings of Anthra's IKAH (Indigenous Knowledge in Animal Health) project, as well as discuss key issues and questions which emerged from the research process. These were: questions on validation of indigenous knowledge (IK) and the process of validation; IK and the privatization of livestock health care systems; inclusion of traditional knowledge systems in existing veterinary curriculum; and privatizing knowledge—bio-patents, bio-piracy and intellectual property rights.

Workshop structure

The key areas identified for the workshop were:

1. Validation of indigenous knowledge and the process of validation
2. Livestock delivery service; privatization of health care systems/knowledge
3. Inclusion of traditional knowledge systems/ethno-veterinary knowledge in existing veterinary curricula
4. Bio-patents, bio-piracy and intellectual property rights

Practical session

5. Identification of medicinal plants and medicine making

Choice of panelists

Anthra's IKAH research touched many fields besides veterinary science. Therefore we felt it was necessary to bring together at this workshop people from different disciplines, and who held diverse views and had different points of view. We felt this would stimulate discussion as well as encourage creative thinking.

Practical session on medicine making

The medicine-making session was an interactive one where healers, pharmacologists, students of veterinary science, and animal health workers came together. Healers from the states of Karnataka, Tamil Nadu, Maharashtra and Andhra Pradesh shared their knowledge and concerns. The groups spent time discussing plants and their importance, beliefs and traditions. Subsequently senior veterinarians Dr. Anjaria and Dr. Sadekar, with the help of Anthra staff, animal health workers and Dr. Sanjay Dakore of ADS, Kashele, Maharashtra - taught medicine making to the participant groups.

Executive Summary

The presentation by Anthra was followed by Panel Presentations.

Panel on Need for Validation and Validation Methods

Dr. Jayvir Anjaria in his presentation spoke about alternative methods of validation. He expressed his dismay over the fact that despite many years of research by premier institutions, barely a handful of drugs were available which could be safely used by the public. He discussed different methods of validation which would vary depending on type of drug and disease. He made note of Anthra's method of validation which he termed "*Anubhava siddha chikitsa*" or experiential empirical validation.

Dr. B. N. Dhawan stressed the need for initial clinical validation and carefully designed research studies. Priority areas of research should provide a rationale for continued usage of traditional remedies to treat disease conditions, with an emphasis on evolving standardized dosage. Conventional approaches were expensive, and using these it could take anywhere from 12 to 30 years to develop a single product. Today the more favoured approach was called ward to laboratory. This involved random biological screening, programmed screening based on traditional use, specialized tests based on chemical structure, semi-synthetic derivatives to optimize activity, and initial clinical trials of select traditional medicines.

Dr. J. K Malik made a presentation on the techniques needed to validate indigenous plant preparations and also highlighted some of the gaps and weaknesses of different protocols, such as lack of recognition of active principle, absence of reliable data from controlled experiment, and absence of data on interactions with food and synthetic drugs. He stressed the need for better research involving a well-coordinated and multi-disciplinary approach as well as the need for the regulation of quality and standardization of processes while preparing drugs.

Ms. Philomena's presentation drew upon the experiences of a group called Shodhini, in the area of human health. She spoke about Shodhini's work which involved documentation of information gathered from women healers; training of women in the use of herbal medicines and simple gynecological techniques; field testing of common herbs at the community level; and finally training of barefoot gynaecologists

to sustain the development of alternatives in women's health care. Through her presentation Ms. Philomena challenged existing laboratory-centred methods.

Panel on Privatization of Health Care Systems

Prof. Vinod Ahuja, presenting the case from an economist's point of view, drew upon his studies from three states to place the case for privatization of certain services. His central argument was that market-based services delivery was not merely an efficient means of allocating resources for private goods/ services, but has the potential to be pro poor. Prof. Ahuja emphasized the positive role of markets in favour of the poor, provided there are strong supporting institutions and an effective State. He also stressed that it was important that the State targets its assistance to benefit the truly poor. He concluded by saying that future debate in livestock service delivery needs to focus on strengthening institutions for markets, political economy, governance and public accountability.

Dr. Imrana Qadeer's presentation drew from her own studies of reforms in the health sector over the past ten years and how they had, in fact, failed to deliver what they had promised. She elaborated on how following Independence, India, in fact, had managed to develop a significant public health infrastructure which had impressive numbers of finely trained medical professionals, nurses and paraprofessionals as well as a fairly impressive public sector drug industry. However, following globalization, many of these were lost to private enterprise—practitioners, hospitals and the private pharmaceutical industry—even as the state, based on recommendations from the World Bank, had made huge cuts in expenditure in the health sector. Health concerns and planning had shifted from the needs of the poor in rural areas to those of the elite in urban areas. She cited various examples to illustrate how despite lofty promises, the quality of health services had gone down following the reforms in the health sector, and how the poor were actually bearing the brunt of a shrinking system.

Prof. Rama Kumar wrapped up the session by saying that if there was a genuine desire to improve the public sector health delivery systems there were certain processes and approaches to be followed, including ensuring well-planned systems, accountability, answerability and building up the necessary capabilities of personnel. He did not think that privatization would necessarily answer these questions and instead felt that unless a holistic approach to veterinary services was developed, the sector would not develop. Some of the essentials to be provided by the system were primary veterinary services, accountable/answerable support, supply and maintenance systems, and a role for alternative indigenous knowledge systems therein.

Panel on Introducing Ethno-Veterinary Courses into College Curriculum

Dr. V. R. Bhamburkar expressed his reservations about formally introducing ethno-veterinary medicine courses into an already overloaded undergraduate curriculum. He, however, was open to the idea of innovative and creative ways in which it could be dealt with either through research programmes at the university or at the postgraduate levels.

Dr. D. Swaroop acknowledged the long history of animal husbandry in India. He went on to describe some of the problems in existing veterinary practice which included the high cost of technology of developing new drugs, emerging drug resistance, environmental contamination posed by modern drugs and the fact that existing veterinary care system barely reached 20% of livestock owners. He felt there was considerable scope and potential for introducing these topics at the undergraduate and postgraduate levels. He felt there was a need to provide basic knowledge and training to veterinary professionals on various aspects of ethno-medicine, ethno-pharmacology and ethno-botany. This would equip them better not only as field veterinarians but also help in critical research work. He also elaborated on the different levels at which these courses could be incorporated.

Dr. Rama Kumar made the concluding presentation. He said that currently the study of indigenous drugs, plant drugs with proven pharmacological and therapeutic efficacy and popular indigenous drugs were a part of the B.V.Sc&A.H. syllabus. The syllabus also included conventional and non-conventional animal rearing patterns in rural and urban areas, conventional feed ingredients and their economic, health and psychological impacts. Therefore there were no legal problems in the use of indigenous medicine or conventional A.H. practice as part of the (veterinary) professional service. However he cautioned against malpractice and misuse of such drugs. He emphasized the need for a National Veterinary Research Policy. The components of such a policy should include region-wise research on conventional animal husbandry practices, manpower and human resource development (HRD), infrastructure development, implementation of current technologies and new skills. He suggested that research and training be dovetailed, possibly by establishing an Indian Council of Veterinary Research ICVR, which in turn should consider regional differences across states and be directed towards making the public health system more responsive to the real needs of livestock rearing communities.

This session ended with the formation of a Working Group that unanimously signed a resolution to be presented to the Council of Deans meeting that was to be

held later in Pantnagar, U.P. The resolution stated: *“In recognition of the economic, social, cultural, scientific and technological importance of bio-diversity and traditional knowledge and in view of current national and international IPR regimes and legislations, it is important and imperative that additional emphasis be placed on traditional knowledge systems and practices within the existing BVSc and A.H. syllabus and appropriate changes made therein.”*

Panel on Bio-patents and Bio-piracy

Prof. Madhav Gadgil described how at different stages of technological development (hunter-gatherer, agrarian, industrial) there have been different forms of conservation practices and mechanisms for their implementation. He said that each stage had its own systems of restricting access to knowledge (intellectual property rights), which in the earlier stages was through trade secrets and today in the form of patents. The Biological Diversity Act was enacted to promote conservation, sustainable use and equitable sharing of benefits of India's biodiversity resources. Towards this, certain new institutions were to be established, such as the National Biodiversity Authority, State Biodiversity Boards and Biodiversity Management Committees at the level of panchayats and municipalities. The Act has also set up procedures for regulating access to biodiversity, its associated knowledge and benefit sharing. He went on then to talk at some depth about the roles, rights and responsibilities of the Biodiversity Management Committees. After citing some examples of MoUs drawn up between scientists and traditional healers, he spoke about the need for NGOs, communities and others working with issues of biodiversity to work towards bringing their work more in line with the framework of this Act.

Mr. C. R. Bijoy spoke about the sheer wealth of biological material, the fact that much of it was located in the tropics and that despite all its advancements the modern “scientific” western world was still learning from indigenous communities. He went on to say that IPRs basically give protection to people who want to make use of knowledge for personal profit. He further elaborated on how international regimes and rules were conveniently structured so as to enable the trade and commodification of biological material, much of which were critical to certain indigenous livelihoods and lifestyles. Countries which are exporters of food are also countries where tens of thousands of children are dying of starvation. The argument that bio-patents would reduce the cost of production and result in cheap food being available to the poor people does not hold true. With the intellectual property regime and bio-patenting in place, the cost of food production will increase so much that food will not be cultivated by farmers but will be produced by agribusiness. He said bio-patents will cause bio-piracy, the theft of

biological material and knowledge for personal or private gain. It will control and eliminate farmers, and control food chains and promote monopoly. Bio-patents will prevent the free exchange of seed varieties (farmers will lose the right to breed their own varieties), facilitate and consolidate corporate control over agriculture, and provide incentives to invest in biotechnology and bio-piracy.

Mr. Vishwas Deviah said that the patenting system was nothing short of the enclosure of intangible commons of the mind. Things that were regarded as common property or at least uncommodifiable were being brought under property rights. The CBD, by asserting the sovereignty of a State over the genetic resources found within its borders, was effectively enclosing the genetic “commons” and, in turn, was subverting the human rights of indigenous peoples and communities. The Convention on Biodiversity (CBD) is not about equity but about facilitating legal access—mainly by corporations from the North—to the genetic resources and knowledge of indigenous and other traditional peoples, mainly in the South.

Ms. Shalini Bhutani emphasized that it was important that the new biodiversity legislation not be considered in isolation, but situated in the context of other legislations. She raised the issue of whether the CBD had lived up to its promises over the years. She raised the issue of Prior Informed Consent and whether they really granted communities the right to say no. As per the WTO, patents are available for any invention, whether products or processes, in all fields of technology, provided that the invention is new, involves an inventive step and is capable of industrial application. Many of these laws were created not so much to protect people’s rights over their resources but the economic rights of different agencies—the state, corporations, international agencies and institutions—over their “knowledge”. There was immense international pressure on India to amend its patent laws and other laws so that they conform to the broader international agenda on patents. The biggest weakness in India’s Biological Diversity Act is that it does not say no to IPRs. While concluding, Ms. Bhutani said that the way forward was by campaigning against IPRs, asserting sovereignty, reviving local food and health cultures, promoting traditional practices, encouraging seed saving and facilitating a new civil disobedience against IPRs. She also appealed for alternative ways and methods of sharing knowledge, such as open knowledge systems existing within the fields of software and music.

Indigenous Knowledge in Animal Health (IKAH) - Anthra Research Findings

The first session of the workshop began with a presentation by Anthra on the Indigenous Knowledge in Animal Health (IKAH) project. Anthra team members comprising Dr. Sagari Ramdas, Dr. Nitya Ghotge, Ms. Ashalatha, Mr. Sanyasi Rao and Dr. Merab Thampi presented the first part of the research, the documentation process. Dr. Ramdas and Dr. Ghotge presented the second part, covering the process of social validation. The power point presentation is given in annexure 1.

In the course of Anthra's work in rural livestock development, we recognized that Indigenous Knowledge (IK) played an important role in animal production. At the same time we realized that this body of knowledge seemed to be rapidly eroding and disappearing from people's practice, which was particularly observable amongst the younger generation of farmers. Along with a large body of valuable practices, we also came across some not-so-beneficial practices. We also recognized a certain tension and gap that existed between the so-called 'formal modern science' and 'people's science'. This complex of factors prompted us to undertake a more systematic exploration of Indigenous Knowledge (IK) with local communities with whom we worked. We initiated our research on Indigenous Knowledge on Animal Health (IKAH) in 1995, which continued until 2003.

The hypothesis of the IKAH project was that sustaining valuable IK within communities had the potential to strengthen livestock production, which would in turn improve people's livelihoods. Thus, the primary objective of our research was to document and validate indigenous ethno-veterinary and livestock management and rearing practices with a view to developing an approach to promote, reintegrate and synthesize useful IK practices into existing farming systems. Our research explored the following specific areas: local production systems in relation to landholding, caste, and production goals of different livestock rearing communities; local breeds and breeding strategies; livestock shelter; feeds and fodder; preventive management and treatment; elements of healing; and marketing of livestock and livestock products. Enquiring into the gender issues in IK and livestock production was an underlying theme of our research. The IKAH research was divided into three phases: 1)documentation, 2)social validation and 3)information and knowledge dissemination.

DOCUMENTATION

Geographically, the IKAH research was located in three distinct agro-ecological zones of Andhra Pradesh and Maharashtra. The districts of Medak (Andhra Pradesh) and Latur (Maharashtra) represent the semi-arid tracts; East Godavari agency areas (AP) and Pune district represent the hilly tracts of the Eastern and Western Ghats respectively; and Vishakapatnam (AP) and Ratnagiri (Maharashtra) represent the (east and west) coastal regions. The actual research was carried out in collaboration with local NGOs/people's organizations that worked in these districts. Documentation was initially done in nine villages in each district, and thus 27 villages in each state. However, the documentation process spread to many more villages and districts, as one part of the research led us to newer areas of exploration in search of the larger picture.

The primary documenters were community/village researchers along with researchers from Anthra. The research team experimented with methodologies and approaches that would help communities to be part of the process of reclaiming their knowledge. We were conscious that the research process should not merely be a mechanical process of 'data collection' but a holistic and comprehensive learning process for everyone, and one that would help communities reconnect with their knowledge systems. With the help of key resource persons, and drawing from our experience, we developed broad guidelines for the information to be documented. Some of the major findings of the documentation phase of the IKAH project are summarized below:

Livestock Shelter

We found that in each area, animal shelters had their own unique and innovative design and were appropriate for the climatic conditions of that area. Farmers preferred local materials for building the shelters. There were innovative designs for feeding, drainage, ventilation and protective measures against ecto-parasites, predators, as also regular practices for the upkeep of shelters. In recent times, inaccessibility to forests, disappearance of varieties needed to construct the shelters, inability to purchase materials, lack of space and so on, have often resulted in the farmers forsaking their IK practices and building small and congested shelters. We found this to be a major factor that predisposed animals to diseases such as chronic respiratory problems, foot rot and mastitis, and accidents and high mortality amongst young ones.

Breeds and Breeding

We looked at the role and place of local breeds within the larger livelihood and production system to understand the significance of why certain breeds historically evolved in a region. Breeds were then described according to the perceptions of local farmers looking at phenotypic, productive and reproductive dimensions, as also selection and breeding strategies of farmers. We finally tried to understand the factors conducive to or endangering the continuity of a breed in a region.

We found that farmers identify local animals as specific breeds both by phenotype and, importantly, the specific purpose or production goal of that animal within the larger production system. Farmers have historically selected animals keeping in mind their production goals (multipurpose requirements, only drought, only milk, meat etc.) and the adaptability of the animal to the local context and available resources. Local breeds are better adapted to the environmental conditions of where they evolved, and are also more immune to prevalent diseases and better adjusted to the chronic seasonal shortages of fodder and water. The irony is that today many breeds are threatened primarily due to indiscriminate breeding policies that have favoured certain specialized production activities (like dairying) and exotic breeds (like exotic Holstein Friesian and Jersey) over local (indigenous) breeds which are completely dependent on certain traditional systems of breeding. Change in agriculture practices, mechanization and replacement of draught animals, and loss of grazing and watering resources have been other major factors that have resulted in loss of breeds and genetic diversity.

A phenomenon particularly noticed in bovines is the sale of prime animals to slaughterhouses during the summer months when there is a chronic feed or water shortage. Another phenomenon noticed in buffaloes is the sale of prime animals after a single lactation. Many of these animals also end up in slaughterhouses. Sale to slaughterhouses often happens at a rate faster than the replacement of seed stock through natural reproduction, thereby leading to genetic erosion. Finally, new emerging diseases have also had a negative impact on the sustainability of local breeds as entire flocks and herds succumb to diseases to which they are not naturally immune.

Feeds and Fodder

Here the major issues explored included an appraisal of local feeds and fodder used in the past and in the present, the seasonal difference in feeding practices, the traditional evaluation or assessment of a feed by farmers, the palatability and availability (both

temporal and actual quantity over time) of fodder. In addition, the project looked at ways of storing feed and fodder, and special feeding practices during disaster situations. Mapping grazing routes and practices, and watering practices was an integral component of the research.

One of the major findings of the research was the dramatic shift in cropping patterns in all areas from food to cash crops. This resulted in a drastic change in diets and reduced variety and quantity of feed available for livestock—especially a reduction in the quality and quantity of crop residues. This shift in cropping pattern was accompanied by a decline in public grazing lands and increase in private lands and fallow, resulting in increased hardships for marginal farmers vis-à-vis grazing. Another perceptible shift was the replacement of perennial grasses by annuals. A disturbing observation was a general loss of knowledge on fodder types amongst members of the younger generations. These shifts were largely linked to and embedded in the larger changes occurring in agriculture, as a response to policies that had enabled capital-, resource- and chemical-intensive green revolution agriculture to flourish and predominate over traditional ecological agriculture practices. A total of 440 traditional fodder varieties in Andhra Pradesh and 298 in Maharashtra comprising trees, shrubs, herbs, climbers, grasses and crops were documented, of which 9–11% were abundantly available, 28–38% were available moderately, 43–54% occasionally available and 9% were scarce. Many of the fodder varieties documented as scarce had become so due to commercial harvesting. Many fodder types that were very palatable to livestock, in fact, were found to be substantially available. A similar distribution was found in both the states.

Local Markets

Generally there continues to be a robust and thriving local market for all kinds of live animals, livestock products and by-products, in all the six regions of our research. The markets range from huge animal fairs like the one at Malegaon (Nanded district, Maharashtra), which draws crowds from many states and is held once a year, to the weekly village markets. However, in some areas there is a clear decline in the market value and demand for a product—for instance the coarse wool of the Deccani sheep. This has immediate repercussions on the future of the breed that may soon get replaced by another one for which there is a greater demand. Thus, the collapse of local markets for some local livestock products is a major factor that determines the future survival of a breed, and in turn genetic diversity. A chain of traders, middlemen and, in the

case of the sheep and goat market, butchers, continue to dominate the buying and selling of live animals and livestock produce. Because there is an immediate market available, producers do not seem aware of a better price. The immediate need for cash is often a crucial reason why farmers sell their animals prematurely, i.e. much before they reach an optimum size or weight that would theoretically fetch them a better price. In the case of large animals (bovines), scarcity of fodder and water are two important reasons for distress sales at throwaway prices. In the case of small ruminants and poultry, disease is the major factor why animals are sold at sub-optimal prices.

Ethno-veterinary Healing Practices

Local healing systems were explored from various angles—primarily to understand what existed, how extensively it was used, and who are the storehouses and keepers of this knowledge. We also explored caste, gender and cultural dimensions of healing as well as more detailed information on specific preventive and curative practices and the status of associated genetic material. To assess the extent of use of ethno-veterinary practices amongst farmers, 430 farmers from five districts and 45 villages were interviewed in 1997. Of these, 338 were men and 92 women. Eighty-five per cent of farmers interviewed stated that they continued to use IK.

Common diseases for which ethno-veterinary medicine was used in Andhra Pradesh and Maharashtra included different types of respiratory problems, ephemeral fever, diarrhoea, black quarter, bloat, foot and mouth disease, foot rot, anorexia, wounds and maggot wounds.

Healers were most concerned that farmers no longer followed their advice and that they regularly switch to allopathic medicines without waiting adequately for the herbal cure to take effect. Interestingly, diseases treated by healers were similar to those farmers claimed they got treated using herbal medicines. Non-availability of medicinal plants was another major problem faced by healers. Some of the solutions they suggested were the rigorous teaching of IK to farmers, cultivation and propagation of rare and scarce plants, and local preparation and processing of herbal medicines, for immediate use. Many healers also acknowledged that there were certain diseases, especially infectious conditions, which they could not cure and, in fact, requested training on immunization practices.

Of the 316 traditional healers interviewed, 293 or 93% were men and a mere 23 or 7% were women. Agriculture was the primary occupation of 82% of the respondents, with the remaining (12%) citing wage labour as their primary means of livelihood. Healers appeared to belong to a range of caste groups—traditional agricultural peasant castes (Mudiraj, Kapu Maratha, Kunbi, Gurav), pastoralist castes (Golla, Kurma, Dhangar, Lambada/Banjara) and Dalits. In the *adivasi* (tribal) areas, the healers were *adivasis* (tribals/indigenous people). The very low number of women healers is intriguing, and we tried to explore the reasons for this. We spoke at length with women, thinking that they may not identify themselves as healers as they did not value their own knowledge. But no matter which way we probed, this did not appear to be the reason. Instead, we identified a highly gendered nature of knowledge flow to be the primary reason for very few specialized women healers. Ninety-seven per cent of healers gained skill and knowledge from a male member—father or grandfather—and only 3% from their mothers or grandmothers. Similarly while 62% healers said they would teach their sons, only 4% intended to pass on their skills and knowledge to their daughters, thus effectively keeping women out of healing activities. Women's knowledge on disease and health care predominated in the care of poultry and of young animals. Another reason for fewer women being involved in healing activities was the prevailing belief that the efficacy of medicines reduces in the hands of menstruating women. Some women expressed fear of being branded as witches.

While more than three-fourths (86%) of healers continued to practice, there was a decline in the number of animals treated in a month. Some reasons for this included: newly emergent diseases for which there were no traditional remedies; non-availability of raw plant- or animal-based material; and loss of faith or patience amongst farmers to follow treatment regimen as per the advice of the healer. The respondents also cited the poor response of animals grazed on pesticide-rich crop residues to ethno-veterinary medicine, as a reason for the declining use of indigenous knowledge. Most healers (75%) continued to render their services free of cost, with only 7–12% charging in cash or kind. Many healers felt that their medicines would lose power or would not work if they put a price to it. The healers also continued to depend completely on forests and common natural resources to access plant materials, and expressed deep concern over the fact that many of the plants they needed for effecting cure were, in fact, becoming scarce.

Diseases and Ethno-veterinary Treatments

A total of 126 disease conditions/symptoms in Maharashtra and 61 disease conditions in Andhra Pradesh affecting livestock (large ruminants, small ruminants, camels, donkeys, pigs, poultry) were documented. Diseases ranged from contagious diseases, diseases of the digestive, respiratory, reproductive and urinary systems, to skin diseases and simple surgical conditions

While a number of home remedies were known to farmers—men and women, certain remedies were known exclusively to specialist healers. A total of 1,223 treatments in Maharashtra and 1,186 treatments in Andhra Pradesh were documented. The same treatments for the same disease were cited by more than one healer/farmer, and there were numerous common treatments documented from all six regions. There were single and mixed-plant treatments as also animal-based and chemical ingredients used in treatments. Numerous plants were used for multiple purposes. Trees, herbs, climbers, shrubs, grasses, legumes were used in treatments. The stem bark was the most commonly used part, followed by leaves, seeds, roots, fruits and flowers. A major cause of concern was that statistically, too, it was obvious that a large number of plants used for treatments were no longer available and were rapidly disappearing—re-emphasizing the concern over loss of genetic material as articulated by healers.

Gender and Indigenous Knowledge

The IKAH project findings reinforced well-known findings in the agricultural and livestock sector—namely, that women contributed 50% to 90% of all labour inputs. This included day-to-day care and management of livestock and performing all the daily jobs (cleaning, collecting fodder, giving water to and feeding animals, milking and caring of all categories of animals) that are critical for the health and production of the animal. However, contribution by women was found to be more significant in the economically and socially disadvantaged households. On the other hand, men performed the more ‘occasional’ tasks and those that lay in the public domain, such as marketing, taking the animal to the doctor, making decisions pertaining to credit, sales and purchase, particularly of large animals. In short, the men controlled the money, while women did the hard work. The only exception was found in the case of backyard poultry, where women were responsible for all activities and were also in control of purchase, sale and marketing.

With respect to indigenous knowledge, traditional caste occupations have played a major role in influencing the type of knowledge available and preserved. For instance, we found that Dalit women, who have worked and continue to work as agriculture labour, had considerable knowledge on the value of weeds as fodder. Women from traditional pastoral families were more knowledgeable on the management and diseases of small ruminants. Those belonging to landowning agricultural castes and who have reared dairy animals are very knowledgeable about the care and management of dairy animals. Women across all castes and land holdings have far greater knowledge on all aspects of poultry management as compared to men. As mentioned earlier, while there are very few specialist women healers, women have a wide repertoire of knowledge on remedies for young, pregnant and lactating animals and poultry. Women belonging to adivasi and pastoral communities appeared to have greater knowledge on ethno-veterinary treatments compared to others.

Some of the critical concerns of women included the heavy workload they have to shoulder at home. At the same time they have limited access to the income from their livestock. They also felt completely dependent on men when animals fell sick. While their own knowledge-base and experience had never been acknowledged or given space, they expressed a strong desire to broaden this knowledge-base by becoming informed about 'traditional' and other technologies.

SOCIAL VALIDATION

At the end of the first phase of documentation, we were faced with the challenge of how to take this knowledge back to communities, who were rapidly losing touch with their own collective heritage. We realized that we could not deal with all the information at once. Responding primarily to the demands of the local communities with whom we worked, we prioritized the areas of feeds and fodder and ethno-veterinary practices as subjects for further enquiry, research and validation in the next phase of the IKAH project.

In the second phase, the primary research objectives were to socially validate ethno-veterinary and fodder and feeding practices, re-disseminate this community-assessed information to the wider community of farmers, and conserve and promote associated biological material through community herbal gardens. Anthra and a multidisciplinary team represented by experts from the community and various academic and scientific

disciplines jointly evolved a protocol for validating the ethno-veterinary and fodder practices. Some of these experts were from premier institutes of India such as the Indian Veterinary Research Institute (IVRI) and Kottakal Arya Vaidya Sala. The technical committee met regularly to guide and steer the research process.

The main steps of the ethno-veterinary social validation protocol included disease-wise, region-wise plant indexing, prioritizing diseases for which treatments would then be assessed, ranking and categorizing of treatments based on ‘Anubhava Siddha Chikitsa’ (experiential validation/empirical information) and secondary literature, and finally field-testing of select treatments.

Extensive literature review was done covering over 122 books, magazines, journals and standard texts of ayurveda, pharmacology, ethno-botany, botany, veterinary science and animal science. Apart from these, different plant databases—such as the NAPRALERT that are hosted by universities and research institutions around the world—were accessed via the internet.

Diseases were categorized and prioritized based on information collected in the first phase of the project. Such information covered diseases commonly treated by healers, diseases for which farmers commonly used ethno-veterinary practices, mortality and morbidity profiles of diseases (diseases to which animals were most likely to succumb), and the ranking of diseases (affecting livestock and poultry) by farmers, according to their relative importance. By this method, between 10 to 12 diseases affecting livestock (e.g. bloat, anorexia, diarrhoea, worms) and five to six poultry diseases (e.g. white diarrhoea, fowl pox, worms) were finally selected for each district.

Subsequently, for each of the selected diseases, the recorded treatments were ranked and categorized according to a system of relative weights assigned to different parameters of information. The experiential parameters included the number of informants for a treatment from the same as well as other districts and the outcome of such treatment as reported by farmers. The retrospective empirical information of whether the animals were cured or not following treatment was also included. The secondary literature parameters included information of the use of the plant for similar conditions from standard Ayurveda texts and other ethno-medicinal books, and information on the therapeutical/pharmacological actions. Information on toxicity and related side effects were also included.

Treatments were then categorized into three main categories: A, B and C. Category A treatments included plants with both high empirical and secondary literature support.

Category B treatments were those that scored high on one of the criteria. Category C treatments used plants with limited empirical information and scanty literature support and/or with toxic properties. In consultation with the technical committee, farmers could immediately be recommended category A treatments for use. Category B treatments required further field trials, and those in C category needed to be referred to appropriate research institutions for further study.

At this stage we also attempted to address some of the gender concerns in the context of healing. Thirty village women volunteered to be trained as Community Animal Health Workers (CAHWs) under the guidance of Anthra veterinarians and learnt to use a couple of B category treatments which were being field validated. Healers also used these treatments and recorded/documentated their experiences as they treated animals. Special case-sheet formats were developed to record information, and these were periodically analysed. Treatments used to treat more than 12 cases were considered for 'validation analysis'. In addition, field-based deworming trials were carried out that involved a comparison of test and control groups that had been exposed and not exposed to the herbal deworming medicines. Six herbal dewormers were rigorously tested, of which one (*Enicostemma axillaire*) was statistically significant against strongyles, one (*Mucuna pruriens*) was negative and the other four did not result in any conclusive outcome.

The final question was how did all this translate into 'numbers'? What was the statistical significance of this exercise? Of the total diseases documented, 20% were prioritized for further validation. The treatments for these prioritized diseases constituted 25% or one-fourth of the total documented treatments. One hundred twenty treatments (20%) were categorized as A, 372 (64%) as B treatments and the remaining 15% treatments were in the C category. Forty-four per cent or 165 of category B treatments were used in field trials between 2000–2003. Nine hundred ruminant cases were treated. Of these, an average 92% of the cases were cured and 8% were not cured. Similarly, 1,777 poultry were treated with a success rate of 100 per cent. Finally, a total of 20 treatments for 10 disease conditions in ruminants and poultry in Andhra Pradesh, and 14 treatments in 8 disease conditions in Maharashtra met the set criteria and have been socially validated. These can be recommended to farmers for practical use.

A similar validation protocol was evolved to analyse traditional fodder varieties. Fodder varieties were indexed across region and species, categorized according to their traditional effects and further ranked based on palatability, availability and toxicity

factors. Secondary literature provided information on nutritional values of the fodder varieties and their use in other regions. Species, which had no nutritional values, were tested for digestive crude protein (DCP) and total digestive nutrient (TDN) values. Three of the ranked fodder varieties were also tested through feeding trials. Traditional lopping techniques were also studied to unravel their effect on the production of biomass and tree growth.

Finally, information that could be immediately used by farmers was disseminated through low-cost publications, training programmes, *jatras*, campaigns and school textbooks. Pilot efforts were made to conserve and promote valuable fodder and medicinal plants through community and kitchen herbal/fodder gardens.

LEARNING POINTS AND CHALLENGES AHEAD

At the end of the nine-year research period many issues have emerged for further reflection, debate and future action, which are summarized below.

Overall, the experience of working on indigenous knowledge showed there was tremendous opportunity to persuade farmers to reintegrate and reapply IK practices in their existing farming systems. However, the real value could be seen only when IK was applied within a larger, holistic farming systems perspective, which encompasses land, livestock and agriculture. For instance, there is little value in treating animals with a herbal remedy if the agricultural system continues to be chemical- and pesticide-intensive and promotes crops devoid of food and fodder value. Hence indigenous knowledge needs to be viewed in its entirety, as a world view and body of knowledge that provides insights and answers to a farming system which is increasingly witnessing the artificial separation of agriculture and livestock as two independent instead of 'integrated' and interdependent production systems. IK has a lot to offer in terms of healing the land with ecologically sound practices that at once enhance production and promote diversity. Only if the land is healed, can the livestock be healed using IK. Indigenous knowledge of livestock production and animal health has wide applications in dryland agriculture, watershed and other natural resource management efforts. For IK to become prevalent in these areas require efforts of individual farmers coupled with major policy changes. Our IKAH research challenges currently held policy perspectives on forests, agriculture and livestock, which are constantly placing the onus of all environmental degradation on poor people and their livestock.

Coming to more specific issues, ethno-veterinary remedies while found effective against a wide range of common disease conditions, are not a panacea for all disease conditions, particularly contagious diseases and other emergent diseases such as peste des petits ruminants (PPR) and blue tongue. They are also not a substitute for a comprehensive public-health care system, which has to play a critical role in preventive and curative health care. A lot of work remains to be done to rebuild the confidence of farmers to use these practices. This is particularly true amongst certain communities such as pastoralists who have virtually stopped using traditional ethno-veterinary practices in their day-to-day lives. According to them, the common diseases that affect their flocks do not respond to such healing practices. Indigenous-based medicine also poses a challenge to farmers with large flocks, as this type of medicine is not available in bulk quantities and is time-consuming to administer to a large number of animals.

Simultaneously we find another significant external threat to people's knowledge and its associated genetic material: the privatization of biodiversity, its knowledge and associated genetic material through intellectual property rights and other patent regimes, as a result of both national and international development policies and trade regimes. On the one hand, communities are increasingly facing declining access to local plants due to commercial overharvesting and loss of user rights to resources. On the other hand, all these ethno-veterinary practices are being abstracted out of a broader context, and being identified as 'innovations' which have the potential to be patented, commodified, and sold as 'ITK(indigenous and traditional knowledge) products', through further scientific research. We strongly anticipate that this latter path of research on traditional knowledge far from enhancing access to a larger number of farmers, will, in fact, only further restrict access, as IK becomes a tradable commodity available only to those who can pay.

Sharing of experiences by collaborating partners and community researchers

The Centre for Environment and Development (CEAD) works in 45 villages located in two mandals (Nakkapalli and Koyyuru) of Visakhapatnam district, Andhra Pradesh.

According to Ms. Vijayalakshmi (secretary, CEAD), the organization's collaboration with Anthra had greatly enriched their own work on animal health and livestock development with local communities. Ms. Vijayalakshmi cited how they were able to train many women to use and apply the local validated knowledge. She specifically described the experience of Chakamma—a poor single woman who volunteered to be trained as a community animal health worker. Chakamma began by taking a loan for some backyard poultry from the local savings group, where she was a member. She religiously put all her knowledge to practice, and slowly she was able to sell birds and ensure that there was no mortality. From these earnings, Chakamma repaid her loan and took a fresh loan for a buffalo. She took care of her buffalo and poultry, applying all the knowledge she had learnt. She repaid the loan, and today is also running a hotel in the village. Ms. Vijayalakshmi concluded by saying that Chakamma was a real example of how the applications of such knowledge has helped in building livelihoods.

Mr. Pandu Dora, currently convenor of the Andhra Pradesh Adivasi Aikyavedika, spoke about his experience of collaboration with Anthra and the IKAH research.

At the time of the IKAH project, Mr. Pandu was director of Girijana Deepika (an adivasi people's organization, based at village D. Bhimavaram in East Godavari district), and a partner organization of Anthra. Mr. Pandu himself is an adivasi belonging to the Koya community. He spoke of the wealth of knowledge within their own community, and its tragic loss due to various reasons. He said the IKAH documentation process provided renewed vigour and impetus to their movement to protect their own resources and knowledge systems and challenge development programmes and policies that denied adivasi people access to their resources.

Mr. Pandu very succinctly and forcefully pointed to the fact that as long as adivasis are denied rights to their land, forests and natural resources, the opportunities for them to, in fact, use their indigenous knowledge are limited. A prerequisite for the use of their knowledge was the right to their resources. He illustrated this with the following

examples in recent years:

- i) The Joint Forest Management (JFM) programme: The area under this programme includes large tracts of land that were being cultivated by adivasis, and many adivasis have lost their *podu* land (shifting cultivation land) to JFM. In the name of forestry protection, the forest officers have used local communities to conduct forest-clearing operations, which has resulted in the destruction of valuable herbs and fodder varieties. Foresters are forcing people to plant species that are of no use to people's livelihoods or to livestock, such as *Jatropha* and *Pongamia*. In this way JFM has further reduced adivasis' access to their land. In the name of forest protection, the forest department is preventing tribals from rearing goats, and placing restrictions on animals grazing in forests.
- ii) Girijana Cooperative Corporation (GCC): In the name of improving sales of minor forest produce, the GCC was facilitating the rampant commodification and commercialization of valuable medicinal plants, such as *Litsea glutinosa* (used for fractures) and *Andrographis paniculata* (used in fevers). *Stercularia urens* and *Tinospora cordifolia* (used in fevers) have become scarce due to high exploitation of these species. As a result, healers and farmers can no longer utilize the medicinal plants for their own treatment.

Mr. Pandu Dora concluded by saying that being trained as a health worker was not sufficient. In the long run, only a combination of effective state veterinary health care service and opportunities for tribal people to utilize their own IK in rearing their animals—a prerequisite of which was adivasi people's rights to and control of their resources—would result in healthy livestock.

Gokul Prakash Pratishthan (GPP) in Ratnagiri district of Maharashtra has been working intensively on watershed development programmes with animal husbandry as a component.

According to Mr. Vasanth Gangavane, a major effort of GPP through their watershed work was to re-instill within local communities the importance of agriculture and animal husbandry. He felt the work on IK provided further insights into ways to develop the land and livestock through watersheds. He also felt IK paved the way to organic farming and enhancing of biodiversity.

Mr. Ratnam, president of Rural Organization for Awareness and Development (ROAD), was the final speaker amongst partner organizations. ROAD is an NGO working in Narsapur block of Medak district since the last 12 years. Some of the important activities of the organization include mobilizing and organizing communities particularly women into groups, goat-rearing with women, building livestock assets for women, revitalizing local water bodies, particularly local traditional irrigation tanks, JFM and watershed programmes.

According to Mr. Ratnam, the collaboration with Anthra on the IKAH project involving the study of fodder varieties was extremely beneficial, as the organization was able to utilize this knowledge and information when they planned their watershed and JFM activities. However, the problem was that often the government was reluctant to include these knowledge systems and species in the programmes and stuck to their own plans. He also stated that their animal health workers, who are trained by Anthra, have now become trainers in the field. Mr. Ratnam strongly felt that every farmer could not become a healer, but that the skills of existing healers ought to be strengthened. Anthra should also take steps to motivate and organize healers to get involved in medicine preparation (in the form of powders, pills and syrups) which they could administer to the local community.

Community health workers/Researchers sharing thoughts

Two community health researchers and health workers, Mr. Narsimhulu from Andhra Pradesh and Mr. Dilip Halse from Maharashtra, shared a few thoughts:

Mr. Narsimhulu belongs to Achampet village, Narsapur taluk. He works as a health worker in Anthra. He said that Anthra trained him as a health worker in ethno-veterinary practices and its scientific documentation. With the help of this training he was able to approach traditional animal healers in different villages, document as well as validate the indigenous knowledge systems of his own people. Today Mr. Narsimhulu is able to treat common diseases like diarrhoea, cold and cough, pneumonia, wounds, fracture, fever, anorexia, etc. with the help of IK. He has become a trainer and is able to train the rural people on ethno-veterinary practices relating to management, feeding, breeding, housing, and marketing. He also pointed out that gradually IK is vanishing from their society, and proper steps need to be taken by the community as well as by the government to preserve this knowledge. He pointed out that it was critical that government veterinary doctors be appointed in rural areas, as the traditional animal

healers are not able to treat diseases like FMD (foot and mouth disease), PPR (pestes du petits ruminants), ET (entero toxemia), HS (Haemorrhagic septicemia), blue tongue, etc. He also said that the government should provide essential vaccinations and deworming services.

Mr. Dilip M. Halse is from village Janapur in Latur district, Maharashtra. Since 1996 he has been working as an animal health worker with Anthra, Pune. He shared that Anthra had trained him very well to vaccinate against FMD, HS, BQ, ET, and sheep pox. He is also able to vaccinate poultry birds against ranikhet and fowl pox. He described how in the beginning when he approached the cattle owners of near by villages, they said they were not interested in the vaccination. Subsequently, these farmers learnt from others that vaccinations and ethno-veterinary care is very effective. Mr. Halse said that farmers were sensitized about vaccinations and ethno-veterinary practices at meetings, jattras, and stalls at markets, and through dramas and songs. He said he has treated more than 60 animals for different diseases such as diarrhoea, bloat, ephemeral fever, fever, wounds, foot rot, cough and cold, fracture, etc. using ethno-veterinary treatment.

Mr. Halse said he had learnt his ethno-veterinary knowledge and skills from about 55 healers. Through the healers he identified and documented various medicinal plants. He said, while earlier he did not know any medicinal plants, after being trained by Anthra and the local healers he began to understand the value of medicinal plants. Earlier he would uproot these “weeds” from his garden, but now he is preserving them.

According to Mr. Halse, the government veterinary doctors are often not available in remote villages. They are also often not available during serious disease outbreaks. While this condition and situation must change, local healers, too, can play an important role in caring for animals. Mr. Dilip Halse keeps prepared ethno-veterinary medicine at home, because at any time people may approach him for the treatment, even at night. He felt that providing animal health care services is an important social obligation. Mr. Halse said that today village communities are extremely concerned about medicinal plants, as these plants are disappearing rapidly from the kitchen gardens, forests and from the surroundings. He urged that the government and community should take steps to preserve and further regenerate these medicinal plants.

Questions and discussion

- *Mr. Ghanekar (NDDDB):* How do you plan to disseminate indigenous knowledge to the farmers?

Dr. Nitya Ghotge and Dr. Sagari Ramdas: Anthra has already begun to disseminate the information to farmers through training programmes, farmers' meetings and publications in local languages (Telugu and Marathi). Innovative venues have been at markets, through exhibitions and *jatras*.

- *Question:* Are you thinking of expanding your area of interest/organization to other parts of the country?

Dr. Sagari Ramdas: We have no active plans to expand Anthra as an institution in other districts. However, we are sharing our approach and perspective through our collaborations with different groups/organizations in training programmes, and assisting other groups to replicate the approach in parts of Andhra Pradesh, Karnataka, Maharashtra and Chattishgarh.

- *Mr. Pandit (Yashwantrao Chavan Pratishthan):* Do you have any plan to commercialize indigenous medicinal products?

Dr. Nitya Ghotge: A clear “no” to Anthra commercializing ethno-veterinary medicines, which we also shared in our presentation. We are teaching farmers to use the medicines as well as those who do not have the time to make their own medicines. We are encouraging groups of local healers, animal health workers and women to make the medicines, and package and sell them at low cost, so that local farmers can purchase and use these value-added medicines, whenever required.

Another participant: In one way, commercialization of the ethno-veterinary medicine is important, because this way the medicine could be used in different parts of the country and it has to be brought into the public knowledge. A regulatory body, at community level or governmental/non-governmental level should take up this process after the proper scientific validation.

Dr. Nitya Ghotge: The entire point of such a research has revealed that each area is rich in its own set of treatments/medicines and could, in fact, build on its own knowledge to reintegrate the practices to the farmers of the area. In this approach it is often far more expensive to commercialize one particular effective drug on a large scale, as most likely there will be a local plant remedy which is equally effective. Large-scale commercialization is not the answer. Documenting the local knowledge and encouraging farmers to use this, is the solution.

- *Question:* Do you have any plans to extend/cover the eastern areas like Jharkhand and Orissa, since in these areas there is very good response from the people for ethno-veterinary care?

Dr Sagari Ramdas: As mentioned earlier, certain groups have approached Anthra, and we are interested in helping groups, as long as their interests, too, are to promote the knowledge locally to farmers.

- *Dr. Dakshinkar:* In the two types of housing at Ratnagiri, how is the cycle of ectoparasites broken?

Dr. Nitya Ghotge and Mr. Sanyasi Rao: The monsoons are the period for multiplication of ticks which also lay their eggs in the crevices of the wooden pillars and the walls of the monsoon housing called the *gotha*. Once the monsoons are over, the entire structure is dismantled and aired, and animals are housed in the temporary structure called *kabvan*. The *gotha* is aired, smoked and exposed to the sun. This kills the tick eggs and additionally the ticks can no longer attach themselves to the host (animal), and thus die. This system of rotating houses through the year keeps the tick population under control.

- *Dr. Dakshinkar:* Does the Indian Drug Act 1941 have any restriction on the preparation of ethno-veterinary medicine and practices?

Dr. Nitya Ghotge: As farmers and healers prepare medicines for their own use and not for commercial purposes, this practice really does not come under the purview of this act. Dr. Anjaria could throw more light on this matter.

- *Dr. Sai Shekhar:* According to Government of India acts and rules can a veterinary doctor prepare ethno-veterinary medicine or not?
- *Person from the audience:* As per the recent Supreme Court ruling, it is illegal for an ayurvedic doctor to prescribe homeopathy or allopathy drugs and that a person trained in a particular discipline/system of medicine must only prescribe drugs within their system of medicine.
- *Dr. D. Swaroop (Head of Department of Medicine, IVRI):* I do not agree and in fact veterinarians can prepare ethno-veterinary medicines. The Supreme Court ruling was made specifically pertaining to human health, because there are separate councils within human medicine for each medical system. However in veterinary science, there is only one council regulating veterinary practice, and nowhere is there a mention against the use of plant-based formulations. It is not illegal for a veterinarian to prescribe ethno-veterinary medicines.

- *Dr Rama Kumar:* The formulations should be standardized, produced commercially by you, otherwise someone else may commercialize their production.

Concluding remarks

At the end of this session, Dr. Anjaria responded to some of the questions regarding the legality of using ethno-veterinary medicines with the following remarks:

- There are nearly 200 zoonotic diseases, which can be communicated from animals to human beings.
- All the drugs are first used on experimental animals and subsequently they are applied to human beings.
- With respect to common diseases like fever, diarrhoea, cough and cold, drugs prescribed to animals are not much different from those prescribed to humans; only the doses vary.
- The Food and Drug Administration (FDA) should first restrict pharmaceutical multinational companies, because some of the pharmaceutical industries are preparing formulations that are being passed off as ayurveda medicine. For example, ENO is marketed as an ayurveda product, but it contains only a couple of drops of Aloe vera and the rest of ingredients are chemical in nature. How can this product be promoted as an Ayurveda product? Therefore, FDA should give clear-cut explanations/definitions regarding the preparation of medicines.
- Present-day shampoos and cosmetics contain only minute quantities of Aloe vera and claims are made that these are Ayurvedic products. None of these formulations are mentioned in the Charak Samhita, and other medicinal *shastras*, so how can one consider these as Ayurvedic products. The FDA should restrict this kind of duplication.
- Anthra's work has been carried out systematically. The organization has two veterinary scientists both registered with the Veterinary Council of India, who have every right to prescribe medicines, including ethno-veterinary treatments.

Recommendation from a workshop participant:

- Relevant literature should be brought out in vernacular languages.
- Standardized products should be disseminated to other areas.
- People's knowledge must be safeguarded at the ground level.



Pergularia daemia



Wrightia tinctoria



Endata pursaetha



Leonotis nepettifolia

Need for Validation and Validation Methods

Rationale for the panel

There are a number of varying positions and opinions on the issue of validation of indigenous knowledge systems, particularly related to healing practices. There are those who argue that the existence of this body of knowledge over thousands of years is proof of its validity and thus there is no need to analyse and validate. On the other hand, there are scientists within the framework of western science and medicine who strongly argue for precise validation of these indigenous knowledge systems and practices, using standard pharmacological and clinical protocols that have been defined by and that exist within western science. At Anthra, we realized that either of the extremes was impractical and we embarked upon an effort to evolve a new paradigm for 'validation', working with the community to prioritize practices, which then could be recommended confidently to farmers. We subsequently termed this process as social validation.

In the context of this workshop we decided to put together a panel of speakers with varied and diverse experiences with regard to validation, who could share their views and experiences on validation of IK and also to reflect upon Anthra's approach to validation.

Validated Ethno-medicinal Practices and Formulations

Jayvir Anjaria

Dr. J. Anjaria's power point presentation is given in annexure 2.

Dr. Jayvir Anjaria began by expressing his concerns about the use and misuse of the term “ayurveda”. He said well-recognized companies are commercially marketing various preparations such as “Eno fruitsalt” and “Vicks-vaporub” as “ayurvedic formulations”, whereas none of these formulations exist in the body of ayurveda. Classic ayurvedic treatise such as Charak Samhita, Sushruth Samhita and Bhavprakash do not carry such formulations. While turning a blind eye to these, scientists were ever ready to question the validity of folk medicines, which have been carefully documented, researched and field validated (referring to Anthra's body of work).

Dr. Anjaria emphasized that disease in animals and humans was basically similar—both suffered from coughs and cold, both contracted diarrhoea, amoebiasis, salmonellosis, etc. Even the causative organisms were the same. In western medicine, the same antibiotics are used to treat disease in animals and human beings, the only difference being that of dosage. A similar logic applied to herbal drugs. The dose for a large ruminant (cow, buffalo) is 16 times the dose for a human, the dose for a small ruminant is eight times that for a human, and the dose for a dog is equivalent to that given to humans. There is species specificity between mono-gastric animals and poly-gastric animals. He also highlighted how all research on drugs in human beings is first carried out on animals, and then the dose gets qualified and quantified and enters human experimentation.

Dr. Anjaria was saddened that despite 50 years of work done by premier institutions such as Central Drug Research Institute, following all the so-called rigorous validation protocols, barely a handful of herbal drugs had actually reached the larger society for public good. Yet in a matter of eight years, Anthra's rigorous work had been able to yield accurate herbal remedies that people can use confidently for treating their animals. This calls for a serious reflection and introspection regarding approaches to validation. Hundreds of crores of rupees have been poured into research and yet one has to search for formulations that have “satisfied” the existing validation protocols. He asked whether we should be satisfied with the one Brahmi for nervous tension?

Dr. Anjaria cited examples such as the current research on *Calotropis procera* as a potential plant to treat malaria. Bhavprakash had written about this thousands of years ago: “Take a tender leaf, put some gud [jaggery] inside, and take it for 3 days

and malaria will go.” Yet it is learnt that the Department of Science and Technology has granted Rs. 66 lakh to work on such malarial medicines. The approach to validation, which is indeed questionable today, is the orientation towards fractionalization of medicinal plants and arriving at their active principles. In fact, this approach often causes the actual medicinal property of the plant to either completely disappear or alternatively increases the medicinal properties of that plant.

Dr. Anjaria drew from his own body of work of over 50 years. He compared and contrasted the efficacy of the crude extract of *Leptadenia reticulata* and the purified active principle gamma sitosterol from the plant phytosterols. He found profoundly different results. The crude extract produced 50 times better results than the purified drug.

He reminded the audience that medical systems such as ayurveda treat the body as a whole and each medicinal plant has got a synergistic effect. “The effect of the whole is greater than the effect of the sum of the individual components”. According to Dr. Anjaria, scientists and researchers, today, were forgetting certain basic principle and getting too embroiled with concepts such as vata, pitha and kapha.

Dr. Anjaria said there were many different approaches to validation, which varied from plant to plant and species to species. Sometimes he feels that “validation” means a drug that is well described in our ancient authentic books, is presented in a researched form in a protocol that has been evolved by the western science, so that it is acceptable to the western science. But even if validated in this manner, there are chances that they will still not meet the parameters set by western science.

He said that a very important aspect of validation, which is often forgotten, is empirical validation—or the concept of “anubhava siddha chikitsa”, a phrase he used frequently in his association with Anthra’s research. The personal experience and applications of herbal remedies are very important and must be taken on board when we talk of validation. He stressed that it was important that India create its own herbal pharmacopoeia.

Finally, Dr. Anjaria concluded by saying that in today’s world, scientists forget that validation is a collective process—an individual vet, human pharmacologist, ethno-botanist, folk healer, physician etc., working in isolation cannot hope to find answers. There has to be a collective and creative fusion of strengths and skills along with a genuine commitment of a consolidated multidisciplinary team of researchers so that ultimately communities and poor farmers will benefit.

Indigenous Knowledge Applications for Livestock Care: Need for Validation and Validation Methods

B. N. Dhawan

Dr. B.N. Dhawan's power point presentation is given in annexure 3.

Prof. Dhawan's presentation focused on the need for initial clinical evaluation of traditional remedies to validate their efficacy and traditional value as also to assess their safety. This, he stressed, could only be achieved through carefully designed clinical studies. The validation not only justified their traditional use but also made the traditional remedies acceptable to practitioners of modern medicine and regulatory authorities. He began by tracing the history of ayurvedic application in livestock care, through highlighting some important ayurvedic texts that described medicines for treating different animals. Priority areas of research, in his view, should be to provide a rationale for continued usage of traditional remedies to treat disease conditions, with an emphasis on evolving standardized dosages. The second area of research should be looking at new applications for traditional drugs. Finally, large-scale screening of so-far-unexplored flora of the country should be carried out, as also follow-up on leads from other countries. According to the WHO guidelines for validating traditional remedies (WHO, 1991), traditional remedies must be subjected to efficacy evaluation (pharmacological and clinical studies), safety studies (toxicity studies) and pharmaceutical studies (botanical authentication of the plant, isolation of active constituents or other chemical markers, standardization of dosages).

The conventional system of testing—also called the 'laboratory to ward' approach—involved the steps of biological screening of prospective materials, bio-chemical studies, pre-clinical and clinical studies. It costs an average 310 billion Swiss francs to finally release a marketable product, and it could take anything from 12-30 years to develop the final product. To shorten the process, he said that the more favoured approach today was the use of a multi-pronged strategy. This approach involved random biological screening, programmed screening based on traditional use, specialized tests based on chemical structure, semi-synthetic derivatives to optimize activity, and initial clinical trials of select traditional medicines. This 'ward to laboratory' approach for drugs with documented traditional use was favoured today as there was a significant reduction in time and cost. In selected cases, safety studies may be required, but in many more cases standardization of dosage form is necessary. This approach expedites and facilitates developing an integrated system of health care, optimizing use and widening global acceptance of traditional medicines.

Validation of Ethno-veterinary Medicine

J. K. Malik

Dr. J.K. Malik's power point presentation is given in annexure 4.

Dr. Malik described the validation methodology for herbal remedies, as it exists in the formal institutions and also highlighted some of the gaps and weaknesses of these protocols.

Within the formal academic institutions, validation is viewed as a way to systematically assess the purity and potency of a drug, variations in its active principles and to conduct stringent regulatory controls on the drug. Bottlenecks in the system have included the lack of recognition of active principles, absence of reliable data from controlled experiments and absence of data on interactions with food and synthetic drugs. The validation protocol broadly involves:

- Identification of medicinal herbs
- Searching literature for available information
- Conducting laboratory tests
- Extraction and identification of active principles
- Evaluation of efficacy of herbal extracts
- Conducting controlled clinical trials
- Monitoring of the use of remedies in the field
- Study of the influence of remedies on economics (pharma-economics)

Dr. Malik discussed different types of extractions and fractions, identification of different chemicals in the extracts, evaluation of pharmacology activity, and different in-vivo screening techniques to identify specific pharmacological activity.

Dr. Malik traced the impetus for validation of ethno-veterinary remedies to the vast resource base in India. There are some 45,000 species of plants in India of which several thousands possess medicinal properties. Of these, about 2,000 species appear in the literature and 500 species are commonly used in indigenous systems of treatment. About 90% of species are available for screening and thus far a mere 4,000 species have been screened for their pharmacological activity. Veterinary herbal remedies have the potential to prevent and treat diseases and enhance production and

reproductive performance. There are 40 veterinary pharmaceutical companies today, which are involved in producing veterinary herbal products.

The process of standardization involved isolation of active principles and working out the mechanism of action, evolving improved methods of quantification, developing better formulas and conducting safety and toxicity studies. Dr. Malik also described the conventional approach to drug discovery (target identification, lead identification, lead optimization, pre-clinical studies and clinical trials) versus the reverse pharmacological approach (large-scale trials, the applications of the latter for drug development, pre-clinical studies and clinical trials). The latter involved less time and money, and reduced toxicity.

Negative validation would protect the farmers from using ineffective remedies, and positive results would provide authenticity to such herbal remedies.

Dr. Malik concluded by saying that further research was required on unexplored plants, with respect to pharmacological, toxicological and clinical evaluation. What was required was a well-coordinated and multidisciplinary approach involving traditional healers, botanists, medicinal chemists, veterinary pharmacologists, clinicians and the veterinary pharmaceutical industry. Finally, there was a major need for the regulation of the quality and standardization processes of veterinary herbal drugs.

The Shodhini approach to Validation of Women's Knowledge of Traditional Medicines and Healing in relation to Women's Reproductive Health

Philomena

Let me thank you once again for the opportunity to share some of our work. On one hand, it is exciting to interact with a similar, yet different, discipline namely, that of livestock and veterinary medicine and, on the other hand, this has given me a chance to get back to reflecting on our work on validation. Its refreshing to re-establish and realize the basic fact that all life is interconnected and that there are a lot of parallels between what Anthra is doing in the area of veterinary science and what we are trying to do in the arena of human health. It is heartening to see that in this present era of economic globalization and commercialization, there are people still concerned about the human side of things. It has indeed been an eye opener to listen to Anthra's efforts to revive these practices in the context of the formal scientific establishment and academia. We share a common concern, namely working towards resources being in the hands of people who have a common heritage and not just a few drug companies that want to monopolize such knowledge.

In this context, Shodhini emerged, because some of us in the NGO sector, especially those working in the areas of health, became interested in looking at alternatives. When we think of health in the Indian context what comes to mind is the rising incidence of illnesses coupled with increasing costs of medical care. At the same time, India is one of the few countries in the world today, which has a living tradition in health care—ancient, but still living.

That's when some of us engaged in health decided to look at our heritage in terms of the resources it can provide in health care, and we began to look closely at people's knowledge, especially women's knowledge. The whole gender question came to the forefront. Inevitably you find that women healers will say they do not know anything and they do not acknowledge their own healing knowledge. Ordinary women deal with many of the day-to-day health care problems. From where did they learn? They acquired this knowledge from their mothers and grandmothers.

Shodhini was launched in the eighties as a collective of about ten organizations across India. Aikya, the organization I am associated with, represented Karnataka and Tamil Nadu; from Andhra Pradesh, the organizations involved were Deccan Development Society and Anveshi; from Gujarat Chetana, Action Aid from Delhi,

and Vikalp from Uttar Pradesh. The term Shodhini was coined as *shodh* means “research” in Sanskrit and Shodhini refers to “women researchers”. A common thread, which connected us, was that we were all working in the area of health care, trying to see whether we can empower women in ways in which they can take charge of their lives. As a woman if you have to take charge of your life, you have to first take charge of your own body, your own self. If you cannot have control of your own body, then it is difficult to be empowered and fight other battles.

Around the same time, Rina Nissim—a health care professional from Europe with a background in allopathy, naturopathy and homeopathy and who had worked with third world groups, especially in Costa Rica—joined hands with us. She had much to offer, especially in terms of providing a “women friendly” orientation to the entire approach. She brought with her a strong critique of modern medicine, which in the sphere of reproductive health, is particularly anti-women. We can illustrate this simply by looking at the way childbirth is organized in a hospital context. It is highly inconvenient for a woman to be lying on a stretcher, flat on her back for childbirth. However it is most convenient for a surgeon or for the gynaecologist. For a woman, childbirth is much easier when she is in a squatting/lower position.

Shodhini aimed to empower women by validating their traditional knowledge of healing, and enhancing its status. We aimed to increase women’s control over their own bodies and their own health by training local women in simple gynaecology and to have greater control over technology and resources through medicinal plants.

So our research was not limited merely to the drugs and whether they worked or not, but covered all aspects of health care, particularly looking at ways that could be empowering for women. Our interest was not merely to test and validate herbal remedies so that the drug companies will accept them but to validate in such a way that women can take control and reclaim what belonged to them. While this knowledge is there, it is currently out of their hands. If it is there, the knowledge does not have “validity” in the eyes of the formal establishment. Women practise silently, but the larger establishment does not accept it, nor value it.

Shodhini’s work happened in four phases. In the first phase, the Shodhini team identified local women healers and collected information on plants and natural elements commonly used for women’s health problems. In the process of doing this we wanted to ensure that these women did not remain just passive knowledge sharers but also became a team of concerned practitioners and researchers looking at their own knowledge and its impact on women.

In the second phase, we trained local women health workers/healers in herbal medicines/simple gynaecological techniques using self-help and holistic approach techniques.

In the third phase of the research, common herbs were field tested and validated using common herbs in a systematic way at community level. These common herbs are used for treating menstrual-cycle disorders, urinary tract infections, hernia, anaemia, aches and pains. But in practice we couldn't cover all these areas. Just to get information linked to the menstrual cycles, urinary tract and vaginal infections and some on herbs related to pregnancy, took nearly three years.

In the last phase of our work we trained a team of barefoot gynaecologists who would continue to sustain the work of developing alternatives in women's health care.

Phase I: The entire process of data collection was spread over four years, between 1987 and 1990. A list of common but neglected women's health problems was prepared through a series of meetings, discussions and dialogue, and included:

- Menstrual-cycle disorders
- Urinary tract and vaginal infections
- Uterine and cervical tumors
- Problems during and after pregnancy, anaemia, nausea, lactation failure, weakness
- Other problems—aches and pains, weakness, genital prolapse, fatigue and depression

The data was collected within 18 months and then computerized. Herbariums were prepared of documented herbs. These were sent to Dr. Indira Balachandran of Kottakal Arya Vaidya Sala, who not only verified the botanical names, but also checked the properties since she is attached to the Arya Vaidya Sala. In all, there were 411 entries that were categorized into categories A, B and C.

Category A plants were those already listed in the classical literature, for the same uses, which the women shared.

Category B plants were listed in the classical literature and used by the ayurvedic and other physicians, but for different symptoms as compared to the ones documented. This was really an eye opener and humbling moment for us. These women who hadn't even been to the poorest of school or college, had the knowledge of both what was listed in the books and also what was not. We have to accept that knowledge originates from life, from experience and only then enters books.

Category C included plants whose properties seemed to be toxic or dangerous.

Of the 411 entries, 252 remedies were categorized in A, B and C categories, with 120 being in category A, 118 in category B and 14 in category C.

Phases II and III: These two phases involved training and operationalizing the data into action, and lasted from 1991 to 1993. Shodhini validated the traditional knowledge through adopting more tentative workable criteria for efficacy of herbs. We defined three levels of inquiry before considering the plants for further action research:

- a) The plant should be used in more than one field area of study for the same symptoms. Surprisingly, nearly 72 plants in the list were used in more than one area.
- b) The traditional use of the plants would be compared with phytochemical knowledge and ayurvedic knowledge. If the botanists and *vaidyas* in the team could verify the plants, they would be considered to have passed the second stage of inquiry.
- c) Experiential use of a plant by a healer on a woman with similar symptoms within the community, and whether this resulted in relief from the symptoms.

Additional criteria for selection were that the plant must be locally available. The plant in the initial documentation should have provided some relief even if there was no full cure. Finally the plant should be non-toxic. Where possible we tried to select simple single-herb or two-herb remedies and avoided to the extent possible multi-herb remedies. We worked with trying to standardize dosages with familiar and practical size/dose equivalents. For instance, for vine-stem barks like *Tinospora cordifolia*, we used the size of an index finger, and estimated the equivalent dosage in grams. For flowers we used the number of flowers.

The healers and development workers who participated in the validation process were trained not only to use herbs but also trained to be sensitive to the person who approached her for advice. They helped us to develop pictorial case sheets. We helped them in the steps involved to treat the person:

The first step is to discover the story of the person who comes to you, not merely in terms of the complaint but getting as complete a profile of the person as possible—their age, background, occupation, caste, family situation. This provides the linkages and gives the larger picture as to the hows and whys of the person being ill/healthy. We found that this process of a person being able to share her situation and problems

with another created a very positive frame of mind in the affected person. Simple counselling and discussion helped to improve the morale of the afflicted person. Women suffering from chronic problems were cured with simple remedies along with supportive advice in changing their diet etc. We taught the health worker to view the problem not as a change from normal to pathological but as normal to not so normal. Often there was no need to recommend a herb or a remedy. Just listening to them and telling them how to change their diet pattern brought about change. Thus our experience on validation was not merely in terms of the efficacy of the herb, or of measuring the active principle, but a holistic approach to the pain and discomfort experienced by the affected person. By 1996-97, 200 cases of different kinds of gynaecological complaints were treated using 30 single-herbal preparations, which were short-listed to be used in the community trials. The gynaecological complaints ranged from vaginal infections, urinary infections, heavy bleeding, painful menstruation, irregular menstruation, backache, anaemia to stress-linked aches and pains. As we were dealing with problems of the reproductive tract, field trials were more complex. For instance, if a remedy pertained to the menstrual cycle the healers must follow the person's progress for at least three monthly cycles to assess the effectiveness of a particular remedy.

We also brought in certain guidelines during the field trials. For instance, if there was no improvement of the symptoms within the first three to ten days, the healers was advised to refer the patient to the formal government referral system. We were in no way trying to substitute modern care by these herbal remedies. However, we felt by initiating women into what is called the "self-help" approach, a lot of simple problems that do not require the intervention of a gynaecologist can be addressed. These included problems related to poor nutrition, poverty, self-neglect, low self-worth. In this context, our approach was more holistic.

A problem experienced by healers and health workers, was that very few people are able to or willing to support them monetarily. We were determined to explore ways in which such women's knowledge and skills could be sustained, despite the fact that they were not being paid for their services. So we are helping them by setting up our own centre, a common place where the women come and make their preparations. The women charge a small amount for their preparations, and on the days when they come to the centre (once or twice a week), we try to offer some kind of a daily support/wage allowance to them. In May 1997, Shodhini's learning experiences were published in a book *Touch Me – Touch Me Not*.

However, it still is an uphill journey. Today at Aikya, traditional birth attendants are being imparted skills of healing other gynecological problems. Listening to the research of Anthra has also given me some ideas about the value and need to document more rigorously the processes that go along with our efforts in reviving local health knowledge systems.

Questions and discussion

- *Dr. Sai Shekhar (directed to Dr. Dhawan and Dr. Malik):* Anthra has presented their validation approach. Would you say that this suffices, or is there any further validation that needs to be done for confirming the validity of the treatments?
- *Dr. Dhawan:* For complete validation there would be need for the treatments to be tested through controlled clinical trials and undergo further toxicity tests.
- *Dr. Malik:* If you use the formal methods as adopted for validating any pharmacological drug, there is a complicated procedure and protocol. All kinds of toxicity tests and residual tests, etc. need to be done. It would take years for any one treatment to be tested using those protocols. At the end, no drug may eventually reach back to farmers. In the context of immediate applications and use by farmers, I think Anthra's approach suffices. Anthra, in any case, is not planning to commercially prepare these ethno-veterinary medicines, in which case it would need to undergo all the various tests in the book.
- *Dr. Imrana Qadeer to Dr. Dhawan:* Why is it that we are always forcing ayurveda (which the formal western allopathic systems have always accorded step-sisterly treatment) to prove itself by the norms and standards being set by a completely different system? When are we going to get out of this approach and mind set of constantly using paradigms created by the "formal" systems to evaluate another system?
- *Dr. Dhawan:* Well, these are the standards that have been set internationally and we have to conform to them if we are to meet international standards and apply for patents.

Emerging issues

There continues to be a wide chasm between the formal protocols of validation (being pursued in most universities and research institutions) and the “social validation” approaches (illustrated by the work done by Shodhini and Anthra). The former aim at commercializing and patenting herbal drugs, while the latter aims at empowering people to gain control over their own knowledge systems and resources.

The formal validation method divides and subdivides to isolate active principles and ingredients. While the social validation approach is more holistic, recognizing the value and role of a herbal remedy in the larger framework of health care as well as the role of the community in validating its own knowledge.

There are scientists within the “formal system”, too, who are questioning the validity of applying validation frameworks of allopathic science for understanding alternative systems of medicine. These validation methods are painstakingly slow, involve a lot of money and time, and at the end of the day a mere handful of medicines are certified as effective. This type of science also has taken away and alienated knowledge from the users and innovators of this knowledge.

There is a clear need to continue the debate and engagement between such “formal” and “alternative” frameworks of validation.



Bombax ceiba



Butea monosperma



Abutilon indicum

Privatization of Health Care Systems

Rationale for the panel

In 2001-02, when Anthra's research on local knowledge systems was nearing completion, there was a sudden push, particularly from international financial institutions and donor agencies such as the World Bank, Danida and the Swiss Agency for Development Cooperation, to support studies, conferences and workshops on the subject of the need for reforms and restructuring within the government veterinary health-care service delivery system, so as to improve its effectiveness and accessibility to the poor. The World Bank in November 2001 came out with a strategy paper on livestock development titled "Livestock Development: Implications for Rural Poverty, the Environment and Global Food Security".

Their argument on animal health services ran as follows:

In many countries structural adjustments reduced government budgets, and stronger separation of private and public sector roles have changed the way animal health services are financed and provided. Declining animal husbandry budgets has made it impossible for the state to improve the system either through increasing manpower, infrastructure or medicines. The bulk of budget continues to be spent on salaries, with a mere 20 per cent available for operational costs. Farmers want doorstep service, and studies show that they (including the poor) are willing to pay for quality services. This requires the following actions:

- ? Continued support for the privatization of animal health services, to provide an enabling environment for the private service providers.*
- ? Full cost recovery for private goods/services provided by the public sector and increased subcontracting of public sector tasks to private veterinarians.*
- ? Increased emphasis on training farmer-veterinarian auxiliaries who do such tasks on a part-time or hire basis.*
- ? Legal changes in the regulatory frameworks to promote para-veterinarians, community animal health workers.*

- ? Continued strengthening and restructuring of public services, performance-based salary structures and training in public sector responsibilities (epidemiological surveillance, food safety, control of drug quality, application for standards for international trade).
- ? Encouraging low-cost technological options such as indigenous knowledge (IK).

Thus the new strategy supports continued privatization and subcontracting of public sector tasks. Private animal health care should focus on a network of professional veterinarians, paraprofessionals and trained livestock farmers. This, they argue, would provide an efficient and low-cost system of animal health care.

At Anthra we are highly perturbed and concerned by this argument. Our experience with training paraprofessionals has shown that well-trained paraprofessionals who provide primary health care to village animals and work in tandem with a veterinary doctor are indeed a critical means of improving health care in the village. However, the sustainability of such a person is only achieved if it is institutionalized into the larger government veterinary health-care delivery system, and the individual is supported by the state.

Our research on ethno-veterinary practices has clearly shown that health has to be approached in a holistic manner—the appropriateness of breeds, assured access to fodder, water and housing are as important as a comprehensive health care programme that includes both prevention and treatment. Ethno-veterinary treatments, while effective for common disease conditions related to digestive, respiratory and reproductive systems, skin and eyes, are not a panacea for all diseases—particularly contagious diseases, for which a sound preventive vaccination programme and promotional health is essential. Indigenous knowledge is NOT a low-cost alternative to dismantling the government veterinary health care delivery system. Our experience of “cost-recovery” in vaccinations is that farmers are not able to “bear the cost of vaccination”. If substantive gains are to be made in controlling endemic diseases, then there is no alternative to the state committing necessary resources to provide comprehensive primary and preventive health care.

Since the time that the World Bank made explicit its strategy, many states across the country have embarked upon a path of privatization of government veterinary services. Some states like Orissa (where over 40 per cent of the population live below poverty line) have already in place a state policy with user fee, cost recovery and gradual phasing out of government veterinary establishments. Others like Uttar Pradesh and Andhra Pradesh have begun to train, and flood the villages with, para-workers ‘Gopalmitra’ who are entitled to charge for services, while vacancies for veterinarians in the health department continue to remain unfilled. In Maharashtra, discussions and consultations are afoot to introduce the same. The Tenth Five Year Plan for Animal Husbandry completely endorses the concept of introducing user fee and cost recovery.

The Veterinary Council of India (VCI), the highest body in the country which regulates veterinary services across India, organized a seminar in 2001 on privatization of services. It was evident from the proceedings that there was no clear consensus, and in fact there were valid reservations about privatization on the part of a large number of participants. Yet much before the VCI could even arrive at some understanding on the matter, state governments were busy creating armies of paraprofessionals, with no institutional mechanisms for their being monitored or being linked into the existing government referral system.

Surprisingly, all this has happened with very little serious debate on the suggested reforms. The only research being conducted completely endorses and supports the reforms. The only voices which both veterinarians within service and farmers have been hearing at “participatory seminars, workshops and meetings” are those which argue vociferously for such reforms.

At Anthra we felt it was indeed important that this issue be debated more widely. We needed to provide a space for the primarily veterinary audience to listen to and participate in this highly important and contentious decision being made by the state for the farmers of India, and get a chance to listen to both sides of the debate. While it was relatively simple to invite speakers to speak on the pro-privatization models, we had a difficult time trying to locate researchers who had seriously studied and critiqued such privatization efforts and its implication.

We finally decided to draw from the experiences of reforms in an affiliated field—the human health sector, where reforms processes have started much earlier (from the mid nineties). A tremendous amount of serious work on looking at and critiquing the privatization of public health-care delivery system in the human health sector has occurred. We thought it was only appropriate that we in the field of veterinary health care get an opportunity to listen to the ten-year experience of similar reforms carried out in the human health sector and debate questions such as: Have the reforms really benefited the poor? Have user fees and cost recovery really improved access to services for the poor? Has privatization really improved standards of health? Has it helped improve efficiency and effectiveness?

Perhaps, we in the veterinary sector could take a cue from here and really think about the reforms which WE need for improving the system and making it really accessible and beneficial for our livestock farmers—and within that locate the space and role for alternative systems of healing.

Livestock Health Services: Balancing Public and Private Roles

Vinod Ahuja

Prof. Ahuja's power point presentation is given in annexure 5.

The first fundamental theorem of welfare economics is: "If (i) there are no externalities, (ii) both buyers and sellers have symmetric information, (iii) there are no increasing returns to scale, (iv) all buyers and sellers take prices as given, then market equilibrium is efficient". The sources of market failure included externalities/public goods, market power, economies of scale, asymmetric information and transaction costs. We need to understand the concepts of subtractability and excludability before beginning the analysis of public and private roles in health care.

Subtractability: this operates when one person's use of a service reduces the amount available to others. Subtractability can be low or high. Low subtractability is illustrated by the following situation: if one farmer accesses information on livestock management, it does not reduce the amount of information that can be accessed by another farmer. An example of high subtractability is a vet's treatment of an animal, which reduces his/her service time for other animals.

Excludability: by this we mean that only those who pay for a service benefit from it. For example, the animal that receives treatment, is the sole beneficiary of the treatment.

Public good: a good that has low subtractability and low excludability; for instance, disease surveillance.

Private good: a good that has high subtractability and high excludability, such as diagnosis and treatment.

Certain private-good components necessitate government intervention if they are faced with situations, which are described as "externalities" or "moral hazard and adverse selection".

An *externality* is a spill-over effect, where for instance, one farmer using a good or service results in extra benefits to (or negative impact on) others who have not used/paid for the good or service (typically vaccinations, pollution). This would justify government intervention through taxes and subsidies. Moral hazard and adverse selection is a situation where consumers do not have the capacity to directly assess the quality of a good/service (e.g., the quality of a vaccine). This again would justify government intervention through regulations and control by appropriate institutions and organizational processes.

What this means is that markets are an effective and efficient way to deliver health care services provided there are effective institutions and organizational processes to enforce accountability, promote ethical behaviour, minimize information asymmetry (education and extension) and provide an appropriate legislative framework. In short, an effective state is necessary for effective functioning of markets.

The typical doubts and objections to market-based service delivery include:

- Producers will be better off under the free or highly subsidized system of service delivery
- Poor will be excluded
- Poor are less likely to gain access to subsidized government services as compared to the rich.

However studies conducted by Ahuja et al. (2000) and Woods (2000) suggest the contrary. Evidence suggests that political and social hierarchical systems tend to exclude the poor more than the market (Leonard, 1985 and 2000; Woods, 2001). Indeed studies show that the poor often gain better access to veterinary care when charges are realistic than when they are highly subsidized (Gros, 1994 and Keinard, 1987). The poor are discerning consumers and are able to distinguish poor quality from top quality services; they are willing to pay for these services, provided they are good and available at their doorstep. (Koma, 2000 and Ahuja, 2000). All this only suggests that supporting institutions and organizational processes must be set into place, which will ensure that market-based service delivery minimizes adverse consequences for the poor.

There is also a need for differential treatment of poor and remote areas. This is because subsistence production, poor infrastructure, distance and poor awareness lead to high transaction costs. The strategies here could include community-based service delivery, involvement of paraprofessionals, membership organizations and self-help groups, and the participation of credible local NGOs.

Public and private roles can be categorized as follows:

Public sector roles

- Public good provision
- Disease surveillance and reporting
- Prevention and control of diseases of national importance
- Vaccination against public diseases

- Diagnostic services
- Movement control, certification and quarantine, and zoonosis control
- Research, extension and training
- Provision of appropriate legal framework
- Overall livestock policy development

Regulatory role

- Regulation and monitoring of clinical animal health services
- Import-export regulation of livestock, livestock products and biologicals
- Regulation of import, supply and use of medicines, vaccines and biologicals

Promotional role

- Creation of enabling environment for private delivery of clinical services
- Contracting private service providers to perform certain public functions
- NGO partnership and assistance

Targeting role

- Identification and implementation of service delivery models for poor remote areas
- Targeted assistance to the poor

Private sector role

- Diagnosis and treatment of sick animals
- Select vaccination services
- Management of physical injuries and first aid
- Surgical procedures
- Castration, hoof trimming, dehorning, etc.
- Artificial insemination services
- Production and distribution of veterinary inputs

Shared roles of the public and private

- Training
- Semen production and distribution
- Research and extension
- Diagnostic services
- Public health management

Strategies to manage and facilitate private participation in service delivery include

- The removal of unfair competition
- Contracting out sanitary mandates, vaccination and other public good services
- Soft loans for initial capital investment
- Promotion of market-supporting institutions that facilitate information flow and healthy competition
- Field-based data as the guide
- Formation of pro-poor coalitions for more effective and sustainable service delivery
- Stakeholder dialogue and consensus building

The markets can play a positive role vis-à-vis the poor provided there are strong supporting institutions and an effective state. It is also important that the state targets its assistance to benefit the really poor. The future debate in livestock-service delivery needs to focus on strengthening institutions for markets, political economy, governance and public accountability.

Human Health and Health Sector Reforms in India: Lessons for Veterinary Services

Imrana Qadeer

For me it is not just a privilege to be here amongst you, but much more. We talk about saving the environment and the green globe but rarely about the relationship between animals, humans and plants which saves us. It was only in the 1970s when I spent a year living in rural Madhya Pradesh that I saw how man and animal together melt in the brown soil to let the green sprout. It was then that I learnt about the dependence of humans on animals and their importance in rural life. I haven't had the privilege of working in this area, but Sagari and Nitya have taught me a lot, and I think we have a lot to learn from each other.

I would like to make a few general statements before I start talking about reforms and privatization. I think yesterday when Anthra presented its work on validation, others talked about systematization of knowledge, and advised them about the need to be more meticulous and adopt more rigorous methods of validation. I think we need to reconsider what science is all about. You ask any student and he or she will tell you that it is evidence-based knowledge, it is systematized knowledge, it is reproducible knowledge but very rarely does a person say that science is 'questioning existing knowledge'.

Science, in my view, is to be aware that however objective you think you are, you are always working under certain assumptions and with a certain perspective. You look at the world from the point where you stand. You ask an architect, and he will give you ten perspectives on a building. I think it is the same about life and us. We look at life from where we stand, and I think the challenge is to be able to look at life from the positions of those who exist in the same time period, but at different positions. Where does this difference come from? This difference comes from the knowledge base that is different for different groups, given their different conditions and histories. This difference also comes from the methods that we use to create knowledge. And therefore, I think that it is very important to realize that to be scientific not only means proclaiming objectivity; it requires of us an awareness and openness about others and our own assumptions and biases and the ability to place them before others.

Today's science is also breaking boundaries. For example, health can not be defined within the framework of any single discipline; it requires an interdisciplinary perspective.

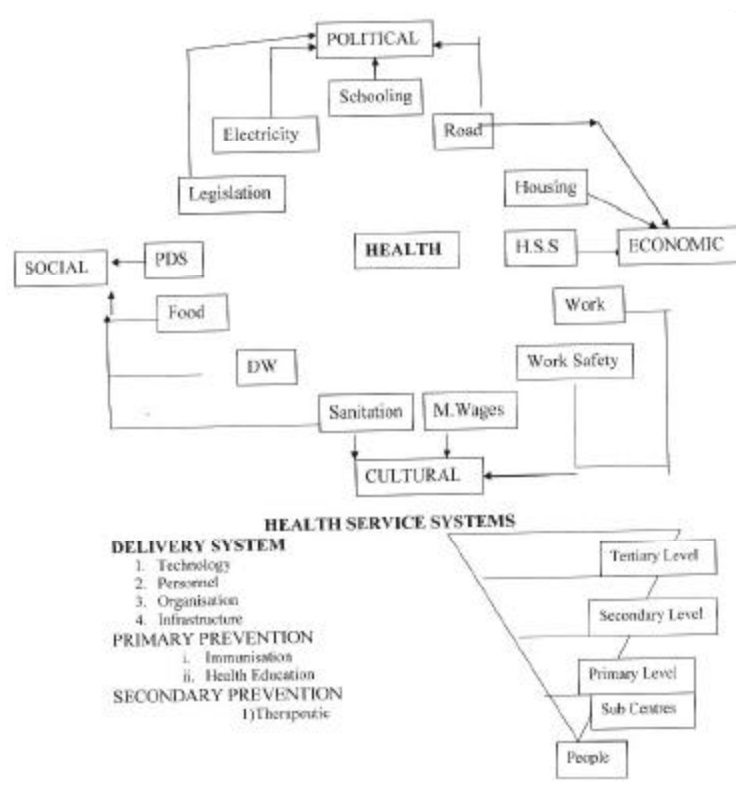
Determinants of Health

In Figure 1, I have just put health in the centre and I am trying to look at the determinants of health. Within a given ecological setting these are:

- Political processes
- Economic processes
- Social processes
- Cultural processes

I've tried to expand on these: work, safety, health service systems, jobs, roads, electricity, government programmes like the Public Distribution System (PDS), food, drinking water, sanitation, minimum wages, etc. You think of anything and they are intimately related with the final outcome, which is health, be it of man or of animals and may I, with humility add, women also, because they are generally forgotten when we talk of health.

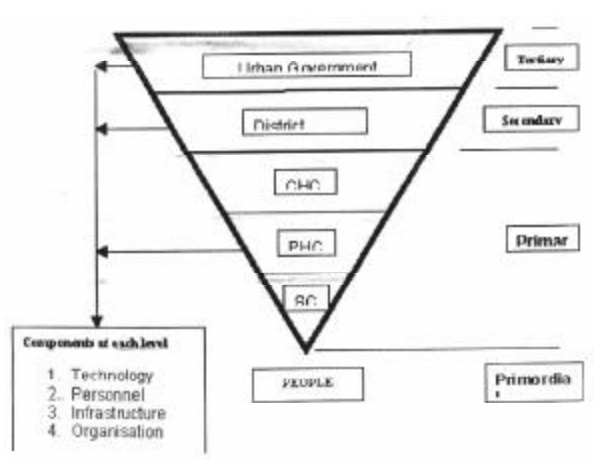
Fig. 1



Levels of Preventive Care

Figure 2 shows that in public health there are four levels of prevention. The first level of prevention is promoting a healthy environment, healthy living conditions, which means non-medical inputs into health with a holistic perspective that we call health promotion or primordial prevention.

Fig. 2



The second is the popular contemporary perception of primary prevention with essentially two components, both very limited. The first is technology, for instance immunization; it covers only a small proportion of diseases and is at times of doubtful value as in the case of polio and hepatitis B (Sathyamala et al. 2005, Dasgupta et al. 2002). The other is education, a favourite of the bureaucracy that treats people as ignorant and education as a one-way process.

In the Third World countries, the key to prevention is the first level, the primordial prevention because without ensuring minimum wages, right to work and fair wages and food security, technology and health education lose their edge. Today, in large parts of Rajasthan, Maharashtra, Karnataka, access to food grains is a problem. Uttar Pradesh, of course, we have stopped talking about because eastern UP is almost forgotten. (That's where I come from.) And as for Bihar and Madhya Pradesh, hunger is considered a state of normalcy.

At the third and the fourth levels of prevention, we have secondary and tertiary prevention. I would like to underline here that these levels of prevention are different because when a sick person is treated, there is a degree of prevention of infectious diseases that can no more spread to others. This is the basis of all infectious disease control programmes using therapeutic interventions for secondary prevention. Tertiary prevention means preventing disabilities caused by advanced diseases. So please do not look at curative, or what is called clinical medicine as just an individual private affair. In the case of all infectious diseases, which constitute the majority of the problems in this country even today, and of course for the poor, curative medicine is a very potent preventive tool when used on a mass scale. I would like you to remember this.

Structure of health services

The structure of the health services that we have built in our country has been such that different types of institutions provide different levels of services. The sub-centres (SCs) and the primary health centres (PHCs) provide the primary level care. The community health centres (CHCs) were created for first-referral-care for patients for disease conditions that could not be managed by the PHCs. The district hospitals provided secondary-level care, and tertiary-level care was the responsibility of hospitals in towns and cities. Each CHC covers a population of 100,000, the PHC covers 30,000 people and the SC caters to a population of 5,000. Planning a good primary health care service called for intra-sectoral integration of the delivery system whose components are technology, infrastructure, manpower and management skills. In building this infrastructure for the public sector, the issues were: the choice of technology, manpower requirements, organizational issues, training of workers and the need to understand and mobilize populations for whom the services were meant.

In short, when we talk of health, let us not simplify it. It is a very complex subject, which has to be contextualized. The context in Third World countries like India was, and continues to be, poverty! It continues to be governments losing their autonomy and becoming subservient to international financing bodies and other donors. That is the context within which we are talking.

Context of health services planning in India

Context, however, should not be taken as constant, and to appreciate shifts in it, let us look at our own history. When India began planning its health services, the first effort

was made in 1938 by a subcommittee of the Congress Planning Committee (Sokhe Committee 1948). It chose to build basic health services and demanded that the state be responsible for the health of the people. The first official report accepted these principles and said that health and disease are rooted in the living conditions of the people and the very high prevalence of diseases in our country is primarily because of poverty. People cannot access services and, therefore, in independent India, it will be the responsibility of the state to look after basic health services to cover the majority of the diseases that were the cause of mortality and morbidity in the country (GOI 1946). The decision that was taken under the direction of the Planning Commission by the First and Second Five Year Plans was that India will build an integrated health service for its people, and integrated meant a good balance of preventive, curative and rehabilitative services. The plans did not talk of promotive services because it was assumed that the larger planning process would address the issue of poverty. Health planning therefore remained restricted to services; it never really became a part of the larger planning process.

There was a special focus on the health of women and it was said that the inter-sectoral planning would, over forty years, create an infrastructure that would make the country fully self-sufficient as regards basic health care. However, since we were beginning and did not have sufficient manpower and material resources at that time, it was decided that the private sector would continue to provide services, collaborate wherever necessary and over a period of time probably be absorbed into the current system.

Reversal of roles

As history has shown, what has actually happened has been the reverse: the public sector is being gradually absorbed into the private sector. These are two very distinct sectors. Public sector means that the resources are derived from the people and the investments that are made according to the needs of the majority are at the centre stage. Public sector also means that there is social accountability and social responsibility, and the government has to make statements annually on achievements and reinvestment of resources generated. Private sector provides services only to those who can pay. Unlike the public sector, nobody can ask where the profits go. Private sector is accountable only to the individual it treats and not to the society at large. Over the years, it has been said that the private sector recognizes its social responsibility and is taking its share of it, but history tells another story and we would look at history.

In the evolution of health service systems, there have been a lot of positive achievements. India built an infrastructure that no other Third World country had until the end of 1970s and mid 1980s except for Sri Lanka. We had an impressive manpower not only as medical professionals but also in terms of nurses and the paramedical personnel we trained. We invested in creating a public sector for drug production and until the 1980s, industries that were making profits against very tough and hard competition and government conditionality. Unfortunately, in the process of liberalization, we have lost them—like we have lost many other profit-making industries. Until the Third Plan there was a very definite build-up of what we needed in basic services: that is the paramedical workers, the PHCs and the SCs. After the Third Plan, there was a discernable shift towards urban services and specializations. In the rural areas, the training of paramedical workers started dwindling. It was said by the policy makers that unnecessary expansion is not good and we should concentrate on PHCs that are fully equipped, fully manned. This led to vast areas with little facilities. These were called twilight zones (GOI 1961). So, very early in the history of evolution of services, a difference of perspectives was already emerging among the planners.

In addition to that, we had the national health programmes for communicable diseases and for maternal and child welfare as well as family welfare. Instead of developing an integrated approach towards these, they were verticalized and became independent of each other except for the National Tuberculosis Programme that was developed as a part of general health services. So we moved towards techno-centricity and verticalization. The main national health programmes in this country have aimed at controlling malaria, filaria, tuberculosis, smallpox and leprosy, and after the mid 1960s, we had the family planning programme. The state wanted to control human population rather animal population in India! There are some critical differences in the programmes and strategies towards humans and animals and this is one of the very important differences.

Verticalization was antithetical to the initial conception of an integrated approach. The lack of inter-sectoral planning, which linked the health sector to other areas of welfare, further affected health planning negatively. Gradually the health sector planning started dissociating itself from the larger holistic perspective. It ignored the importance of sanitation, drinking water supply and nutrition. Today, instead of worrying about malnutrition deaths, planners argue that India has unnecessarily high recommended dietary allowances. These need to be lowered because, according to them, obesity will become a major problem in this country (Qadeer et al. 2005). This fear is based on

extremely limited studies of city schools which can hardly represent the reality of the one billion plus population.

The other interesting development was that the ubiquitous private sector, which was considered weak and benign and given space, started improving its position by making inroads into the public sector. Private practitioners were given positions in hospitals as part-timers and concessions for loans and tax exemptions on equipment imports; they were also given land leases to run charity hospitals. Private practitioners became a very powerful group that grew fast and influenced government medical colleges. The professors, teachers and other public sector doctors also started practicing, and private practice in public sector became a fact of life. Over time, the private sector grew so powerful that it started competing with the public sector. In addition to the private practitioners, polyclinics, nursing homes, tertiary hospitals and finally corporate hospitals constituted the private sector. We doctors got almost free medical education but nobody talks about that. However, the right of the doctor to practice is defended even by the Planning Commission through its Tenth Five Year Plan (GOI 2002).

Separation of private services between rich and poor

So essentially what has happened over time is that two kinds of services were created; the corporate sector as part of the urban elite services has become very powerful even though it represents only about 2 per cent of the total private sector. In the city of Delhi, two years back, the Delhi government had started registering nursing homes and after 400 registrations, they had to stop. They had to stop because there was political pressure from the Indian Medical Association who did not wish to confront the fact that the nursing homes were working under subhuman conditions and that they should improve themselves.

Part of the remaining private sector is the unfortunate middle-class MBBS graduates who cannot get into government service and therefore they have to go to the market and offer their services. It has been demonstrated that doctors can practise scientific medicine when they are part of an institution because there they have the protection of the institution and can tell the patient that they will not prescribe unnecessary medication; and it is the diet change which is important or that just one tablet will do the job and that an injection is unnecessary. But if a doctor is part of the marketplace where there are 50 other doctors ready to do exactly as the patient wants, then a sincere doctor may as well close shop. Most of the doctors, a research student found, were practising unscientific medicine. It was not because they lacked scientific education or

that they were poor graduates, but they were forced to adopt unscientific methods in order to survive in the marketplace (Goenka 2002).

Then there is a vast mass, which we physicians very derogatively call 'quacks'. These may be traditional practitioners or people who were earlier given the three-year training which was later on banned. At times these are practitioners who simply pick up skills while working as compounders, nurses or as assistants to doctors. In situations like disasters, controversies about their right to practice and ethical issues are raised, but one thing cannot be denied that even in Delhi where 65 per cent of the population lives in the margins of the city (its resettlement and unauthorised colonies and slums), almost 70 per cent of this population depends on these 'medical' providers (Hazard Centre 2003). It is very easy to blacklist the informal practitioners and to ban them, but what is the alternative for those whom the system fails? Is it fair to remove these practitioners and then forget about the marginalized or should we at least talk about improving the skills of these practitioners, providing them some training and creating linkages with the existing health care system for support and referral? With the shrinking public sector this is the only alternative. If the Rural Health Mission (GOI 2005) can use village women, why can't the cities use their untrained practitioners for strengthening the health system?

Shrinkage of the public sector health services

The public sector health system is losing its strengths and is shrinking. It is shrinking because after the Third Plan when we shifted towards the techno-centric approach, we became extremely doctor-oriented, we stopped emphasizing training and the number of health assistants that we created was extremely limited. So our peripheral institutions suffered. When the size of any organization increases, no doubt bureaucratization seeps in, but we never tried to develop management skills to make it work better. Over and above, I think there was a very clear policy decision that the health service system will do primarily population control, and maternal and child health for the sake of population control. The health service system will carry on a few disease control programmes and a bit of curative work. So, we never really bothered to improve our system. The only disease that we have managed to control in these years of independence is smallpox and that too was possible because smallpox has a very specific epidemiological character. We have failed when it comes to complex diseases such as malaria, filaria and kala azar because they are so ecologically embedded and we do not wish to intervene at that level. Despite earlier failures, lately the WHO with the complete support of those who

produce the drugs has brought to India a policy wherein today they are experimenting with anti-filarial drug en mass. Experimental projects of giving drugs to the entire population have been started without adequately testing the impact of that drug in Indian conditions (GOI 2004).

The vested interests of professionals, the glamour of privatization, the use of the public sector by the private and the indifference of the political and administrative authorities towards maintaining accountability has brought down the quality of services within the public sector, which forces people away from it unless they can afford nothing else. By the end of the 1980s the government's own publications acknowledged that there were problems and listed out those problems. There has been self-criticism also, with efforts at sorting out problems. Tuberculosis is one very important example where a group of national experts sat together and analysed what had gone wrong because the tuberculosis programme in India was one of the programmes which evolved after a lot of research. It is a programme that was accepted in a large number of Third World countries as their answer to the problem of tuberculosis. The recommendation of the expert committee in the 1990s was that the conception of the programme is excellent, we have been poorly managing it, and we have not been able to provide drugs, so what we need to do is improve the systems of provision, monitoring, supplies and so on (Nagpaul 1994). Instead, the international experts prevailed and they transformed the programme into yet another vertical programme with an entirely new set of drugs; drugs that we don't produce and for which we are totally dependent on the West.

The early 1990s brought in the official policy of structural adjustment and health sector reforms (Qadeer 2000) that further curtailed the public sector.

In other words, it was evident that we were wrong, yet we did not have the will to accept it and evolve our own solution. It is political will that is often blamed but that only absolves the professionals from standing up and being counted. The point that I'm trying to make is that when things are wrong we have to study them, we have to analyse them and find our own solutions. We cannot just accept solutions that come out of the blue and are forced upon large numbers of countries irrespective of their context. If that is happening, then one has to be conscious of it and think about it.

Unfortunately, instead of doing our own reforms, we accepted blindly the conditionalities of structural adjustment programmes. By 1997, the Third World countries had a debt of 2,173 billion dollars! Of this, the Asian countries had a total debt of 150 billion dollars, of which India's share was 94 billion dollars, which increased

to nearly 99 billion dollars in 1999 and is presently over 100 billion dollars. When the donors started making demands about repayments, the state accepted all the conditionalities necessary for further loans. And what conditionality did we accept? We accepted what is today popularly called globalization, becoming one with the world. Becoming one is fine, but are we becoming part of the global system as an equal or as a subordinate member? That is the question that we need to ask and understand. I will only deal with what happened in the health sector.

The shift from public to private sector health care services: Sector reforms

In 1993, the World Bank came out with a report called “Investing in Health”. According to this report, the quality of care of services in the private sector is better than the public sector and therefore we needed to shift our emphasis. We were told that we as a country lack resources and therefore we need to cut investments in health. It was argued that when you cut investments in health, privatize and introduce user fee in hospitals, you are only removing the rich from using those hospitals, so the poor can go on using the facilities and they are better served. We were also told that efficiency increases this way and that health is not necessarily a public good. These were the reasons given for health sector reforms that India accepted (World Bank 1993).

In 1992 the World Bank in fact came out with a report, which is called “Financial Planning for the Health Sector in India”. So, by the beginning of the 1990s they had already started planning for us. Of course, our government says that they were the ones who were planning and that they have not accepted anything that the World Bank has said. But, if you read the plans, you find that report was accepted completely.

The health sector reforms that we accepted were:

- Cuts in resources for the health sector
- Opening up of medical care (not public health) to the private sector
- Introduction of user fee in public sector hospitals
- Private investments in public hospitals through contracting services to private sector
- Casualization of personnel

These measures were adopted to bring efficiency and make services cheaper. There is on the contrary enough evidence to show that these measures only further marginalize the poor (Mahal et al. 2003). The experience of the British Health Services show clearly that privatization has not worked, as the cost of service has actually gone up and the poor are the worst affected (Pollock 2004).

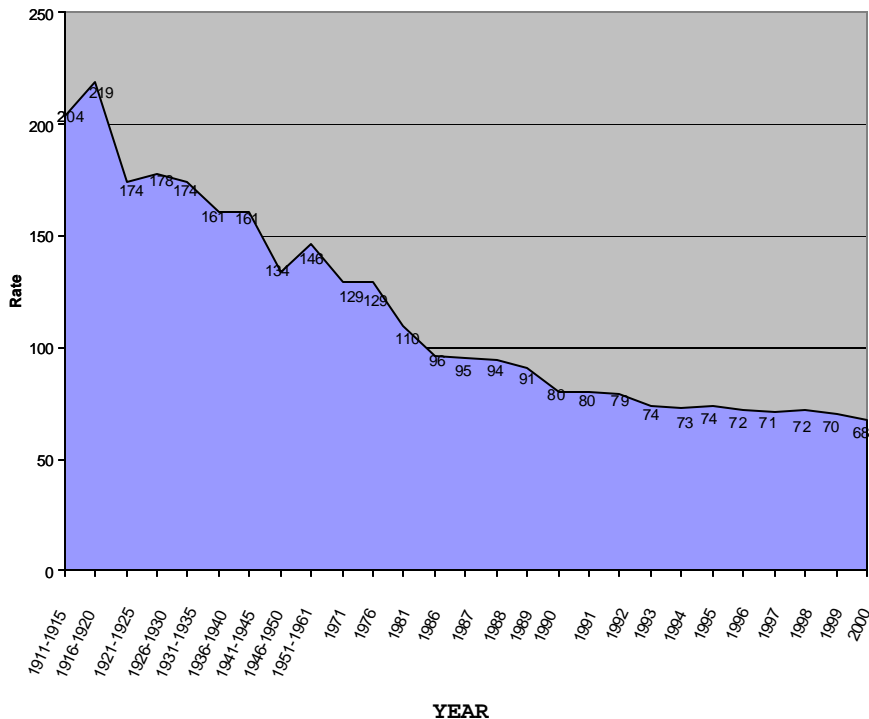
It has been argued that 70 per cent of the costs of running PHCs and CHCs go towards salaries, leaving very little for drugs, and this wasteful expenditure calls for casualization of personnel. There is a major problem with this view. In an integrated public-health service system where immunization, monitoring, secondary prevention, health education are regular activities in addition to record keeping, supervision and mobilization, can one function with casual workers who have no stake in the system and no interest in long-term strategies? It is absolutely ridiculous because if the total investment in health came down from 5 per cent in the First and Second Plan to 0.9 per cent of the GDP in the present plan, then the issue is whether this investment is sufficient? More important than that is the pattern of investment rationale, both epidemiologically and socially?

It is obvious that such low levels of investment, casualized manpower and weak PHCs could hardly be a basis for strong public health services. Even a Rural Health Mission cannot hide the real intent of the state by simply projecting Accredited Social Health Activists (ASHA) as the panacea for all the ills of primary care. If these workers do not have the support of a strong PHC network, the CHC alone cannot support or supervise the work of sub-centres (numbering 20 to 30 under each CHC). The only focus will be reproductive and child health (RHC) and fertility control, with little attention to undernutrition, anaemia, and common communicable diseases other than the three identified for intervention. This is evident from the fact that the mission depends on the existing resources of the family welfare and communicable disease control programmes and is focused on emergency obstetrics and reproductive health care as means of fertility control. The CHCs and the sub-centres are the chosen institutions for reinforcement while PHCs are left to linger on. This is not comprehensive public health; it is a continuation of the process of dismantling the existing infrastructure, and in the name of decentralization, shifting responsibility to panchayats without actually strengthening these institutions for this job. It also means encouraging privatization as referral facilities are weakened due to undermining of PHCs and people are left to choose between private providers and the far-off CHC. This kind of planning has made the public sector ineffective and unresponsive, but the real question is: why do we need a health department if it is not ready to take the responsibility of running its basic infrastructure? That is where the flab is and not at the level of peripheral health workers.

Implications of the Health Sector Reforms

The 'reforms' were introduced in the nineties. With it the first thing that happened was a major malaria epidemic in 1992. The entire state of Rajasthan and some nearby states were affected. In 1994, we had the plague epidemic, because we had cut down all our monitoring systems that made it impossible to know what was happening and we made a mess of it (Qadeer et al. 1994). We had kala azar spreading all over the eastern parts, blood dysenteries in tribal areas, which the media did not even report and encephalitis and hepatitis in major cities. It was only after all this that the government reversed some of the budgetary cut-backs of 1991-92 that almost starved health services of resources. Other than the epidemics, the infant mortality figures also indicated a worsening situation. We were doing pretty well until 1991; since then there has been a complete stagnation in the rate of decline of infant mortality (figure 3).

Fig. 3: INFANT MORTALITY RATES IN INDIA



Similarly let us look at infrastructure (table 1). The PHCs have barely increased by a thousand after 1995. The SCs have remained at 13,000 and only 5,000 have been added over the decade. The total number of hospitals increased primarily due to the rise in number of private institutions as the investments in public sector hospitals have actually declined (table 1). Private medical education and the practice of capitation fee are flourishing. According to current government records, out of the total 208 medical colleges, 109 are government medical colleges and 89 are private medical colleges. The state of private medical colleges is bad as most often both faculty and teaching hospitals are wanting. The doctors, of course, are flourishing but other workers are being neglected on all counts. The auxiliary nurse midwives (ANMs) have increased, but both nurses and ANMs have largely shifted into the urban private sector on very poor scales. The number of health assistants and male field workers have also either stagnated or declined. All this is an outcome of the casualization process that I spoke of earlier.

Table 1: HEALTH SERVICE INFRASTRUCTURE AND PERSONNEL IN INDIA

	1980	1985	1990	1995	2001
Hospitals and Dispensaries	6596	7369	11245	15097	37928
Primary health centres	5499	21874 7250	20536	28225 21802	22842
Sub centres	4932	83008	130390	132285	137311
Beds	460886	518598	-	870161	712067
Medical Colleges	106	106	128	160	189
Doctors	255138	306966	365000*	474270	575600
Nurses	146201	197735	311235	512595	776355
Auxillary nurse-midwife	71434	98543	150431	229304	419077
Sanitary inspectors and health assistants					
	25192	28050	22967*	34649	39782
Pharmacists	155621	157666	-	175000	21118

Figures for 1991

+ Health assistants only

Sources: GOI (1996), Rural Health Statistics of India, Bulletin Ministry of Health: GOI (1996-97), Economic survey of India; GOI (1997), Ninth Five Year Plan.

A similar story can be found in the growth of private beds relative to public beds. The all-India figures show that in 1973 we had about 200,000 public and only 66,000 private beds. By the early 1990s, public beds numbered 300,000 whereas beds in the private sector had increased to 200,000. Most of these beds are in small institutions, which are now cropping up in all cities (table 2).

One very strong argument for shifting over to the private services is that people themselves are making the choice. That people have shifted from public sector to the private sector over 1986-1996 is true. The overall shift is much more among outdoor patients than in-patient hospital care (tables 3 & 4).

Table 2: GROWTH OF PRIVATE BEDS RELATIVE TO PUBLIC BEDS IN MAJOR STATES

S.No	States	1973		1983		1993	
		Public beds	Private Beds	Public Beds	Private Beds	Public Beds	Private Beds
1.	Andhra Pradesh	19,356	9213	22,722	11,103	22,776	26,761
2.	Bihar	11,722	N.A	14,078	8,447	20,522	8,519
3.	Gujarat	10,150	1,219	11,502	16,929	20,708	33,487
4.	Haryana	3,767	1,877	4,744	2,566	4,796	3,232
5.	Karnataka	18,485	5,106	21,267	7,779	27,216	9,999
6.	Kerala	19,623	N.A	24,875	18,203	28,030	49,169
7.	Madhya Pradesh	12,551	1,601	16,827	N.A	25,310	NA
8.	Maharashtra	23,653	8,300	37,790	26,024	34,261	37,758
9.	Orissa	7,235	1,741	9,988	1,408	13,077	1,306
10.	Punjab	5,918	2,070	11,316	2,913	10,786	3,782
11.	Tamilnadu	13,287	9,618	31,574	8,562	37,935	10,366
12.	Uttar Pradesh	23,326	10,897	33,125	12,083	34,267	12,026
13.	West Bengal	25,106	8,452	42,319	6,424	47,252	6,912
14.	All India	2,30,161	66,926	3,29,245	1,34,266	3,65,696	2,10,987

Source: Government of India, Ministry of Health & Family Welfare, Health Information of India, Central Bureau of Health Intelligence (new Delhi: Government of India, various years)

Table 3: UTILISATION OF OUT-PATIENT CARE: ALL INDIA TRENDS

Health Sectors	Rural		1986-87	1995-96
	1986-87	1995-96		
Share of Public Sector	25.6	19.0	27.2	19.0
Public hospital	17.7	11.0	22.6	15.0
PHC/CHC*	4.9	6.0	1.2	1.0
Public Dispensary	2.6	2.0	1.8	2.0
ESI doctor	0.4	0.0	1.6	1.0
ANM/MP/AWW@				
Share of Private Sector	74.5	80.0	72.9	81.0
Private Hospital	15.2	12.0	16.2	16.0
Nursing Home	0.8	3.0	1.2	2.0
Charitable Institution	0.4	0.0	0.8	1.0
Private Doctor	53.0	55.0	51.8	55.0
Others	52	10.0	2.9	7.0
Total	100.1	99.0	100.0	100.0

Notes: * PHC –Primary Health Centre
 CHC –Community Health Centre
 @ANM –Auxiliary Nursewife
 MPW –Multipurpose Worker
 AWW –Anganwadi Worker

Table 4: UTILISATION OF HOSPITAL CARE: ALL INDIA TRENDS

Health Sectors	Rural	Percent of distribution		
		1986-87	1995-96	Urban
Share of Public Sector	59.7	45.2	60.3	43.1
Public Hospital	55.4	39.9	59.5	41.8
PHC*	4.3	4.8	0.9	
Public Dispensary		0.5		0.4
Share of Private Sector	40.3	54.7	39.7	56.7
Private Hospital	32.0	41.9	29.6	41.0
Nursing Home	4.9	8.0	1.9	11.1
Charitable Institution	1.7	4.0	7.0	4.2
Others	1.7	0.8	1.2	0.6
Total	100.0	99.9	100.0	100.0

Sources: 1986-87 (NSSO 1992, statement 2R&2U,p.53-54)
 1995-96(NSSO 1998), Table 4,16,p.28

Notes:* PHC –Primary Health Centre

However, there is something that we need to understand. When utilization pattern is seen according to the poverty percentiles in 1989, 48 per cent of those in the 0-40th percentile used the public sector (table 5).

Table 5: DISTRIBUTION OF HOSPITALISED CASES IN URBAN AREAS ACROSS FRACTILE GROUPS-ALL INDIA

SI No	Type of Institution							
	Fractile Groups	Public Hospital (1)		Private Hospital (2)		Nursing Home (3)		Private Institutions (4)
		%	Cases	%	Cases	%	Cases	Total No. of Cases 2+3
1.	0-20	25.5	414	17.2	152	14.4	26	178
2.	20-40	22.6	367	19.4	172	19.3	35	207
3.	40-60	21.3	344	19.9	176	14.9	27	203
4.	60-80	21.5	349	27.5	243	37.6	68	311
5.	80-100	9.2	149	16.0	142	13.8	25	167
6.	Total	100	1,623	100	885	100	181	1,066

Note: Numbers are in thousands.

Sources: Government of India, Central Statistical Organization, Utilisation of Medical Services, 42nd Round of the National Sample Survey, No.364 (New Delhi: Government of India 1989).

This means that while the shift away from public sector was much more marked in the out-patients, for indoor hospital care the poor were still going to the public sector. This shows how averages hide reality. From 48 per cent in 1989, this proportion moved up to 60 per cent in 1998 (figure 4), because the poor could not afford to go to the private sector. When the services accessed by the poor are further analysed for 1998, it is found that for immunization 92 per cent go to the public sector, and for pre-natal care and institutional deliveries respectively, 73 per cent and 69 per cent use the public sector. Table 6 shows that the proportion of untreated cases over time has also increased along with shrinking services and rising costs.

So this is what the “reforms” and the shifts over the 1990s have handed to us. Today services are definitely better for those who can pay. People like us can probably go to more nursing homes and modern hospitals, but what about the poor people about whom we are all very concerned? What is happening to them? Isn't that what we need to consider?

Fig. 4: Public and Private Shares of Delivery of Selected Health Care Services in India, by Income Status of Patients, 1995-96

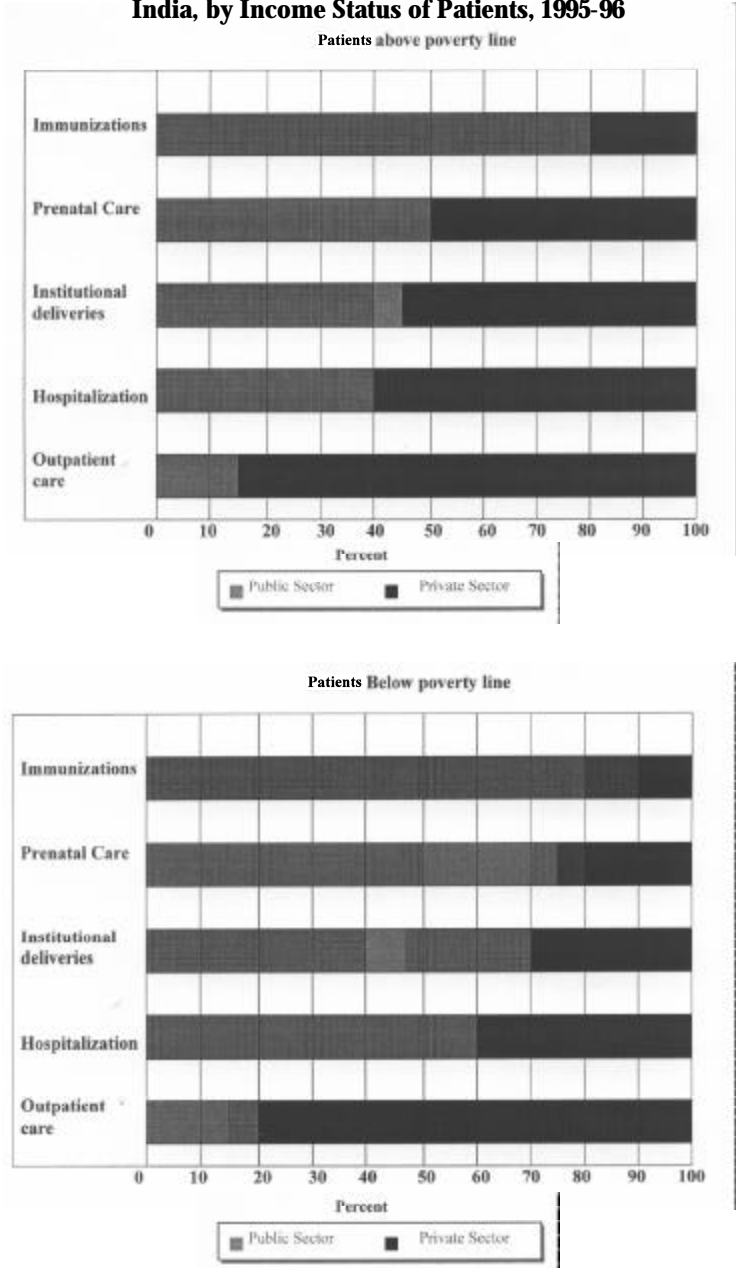


Table 6: RATES OF UNTREATED AILMENTS* : ALL INDIA TRENDS

	Rural			Urban			Rural: Urban Ratio		
	No.per 1000 1986- 87	1995- 96	Change 1986- 96	No.per 1000 1986- 87	1995- 96	Change 1986- 96	1986- 87	1995- 96	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Gender									
Male	172.4	162	-6%	98.1	90	-8%	1.76	1.80	
Female	198.0	184	-7%	118.9	97	-18%	1.67	1.90	
Both	184.8	173	-6%	108.6	93	-14%	1.70	1.86	
Female/male ratio	1.15	1.14	-1%	1.21	1.08	-11%			
MPCE Fractiles@									
Males									
00 to 10	198.2	276	39%	111.8	180	61%	1.77	1.53	
10 to 20	175.6	210	20%	103.6	122	18%	1.70	1.72	
20 to 40	192.5	175	-9%	103.1	91	-12%	1.87	1.92	
40 to 60	172.8	170	-2%	88.6	80	-10%	1.95	2.13	
60 to 80	167.9	162	-4%	91.8	72	-22%	1.83	2.25	
80 to 90	141.7	132	-7%	92.5	38	-59%	1.53	3.47	
90 to 100	103.6	85	-18%	122.6	102	-17%	0.85	0.83	
Range	94.6	191.0		-10.8	78.0				
Females									
00 to 10	233.9	241	3%	190.5	193	1%	1.23	1.25	
10 to 20	267.7	245	-8%	137.0	137	0%	1.95	1.79	
20 to 40	198.1	217	10%	128.7	105	-18%	1.54	2.07	
40 to 60	207.0	206	0%	126.4	95	-25%	1.64	2.17	
60 to 80	194.7	177	-9%	71.4	82	15%	2.73	2.16	
80 to 90	138.6	148	7%	90.0	54	-40%	1.54	2.74	
90 to 100	92.8	106	14%	93.6	67	-28%	0.99	1.58	
Range	141.2	135.0		96.9	126.0				

Source: 1986-87(NSSO 1992, Statement 11,p.66) 1995-96 (NSSO 1998, Source Table 8.2, A -46, A-151)

Notes:* Untreated Morbidity =100,000 (1986-87) or 1000(1995-96) minus rate of treated morbidity. @ Monthly Per Capita Expenditure (MPCE) Fractiles are rough proxy indicators of economic status.

Privatization and the dismantling of public sector health services

In 1978, the Alma Ata Declaration talked of comprehensive primary health care. Over the years, the one thing that the state has very effectively done is the complete distortion of the term 'comprehensive primary health care'. Comprehensive primary health care meant that we identify the health needs of the people and locate them at the centre of a comprehensive development strategy for the people. If health planning is done independent of the larger planning, it never succeeds. The policy makers and the international donors have consistently attacked this concept over the 1990s.

From primary health care, they first started talking of selective primary health care. They said that development will take too long and we cannot wait, we have to be selective; and they chose family planning and maternal and child health. Then, even

that was considered too much because the concept of integrated approach remained intact even in selective primary health care—the importance of a referral system, linkages within the infrastructure and a strong peripheral network of district services was integral to even selective primary health care. The next step in the reforms was to privatize the state's tertiary, secondary and first referral (CHC) units as these were medical care institutions. Thus, selective primary health care was reduced to “primary level care”: and what did it mean? A person could have his fever treated with aspirin and his diarrhoea treated with some old sulphadiazine tablets if available at the PHC. If he was sicker than that, he then had a choice between his pocket and his god because the most that the state could do was to identify private hospitals as first referral units without strengthening their own block and district institutions. So that was the policy that we adopted in the 1990s: techno-centric, urban oriented, biased towards the private sector and insensitive to the needs of the poor. It claimed that state subsidies are not good for the health sector as it enhances dependence and inefficiency!

Earlier we had a system of taxation where we paid according to our earnings. Over the 1990s, the taxation structure has changed in a way that the middle class pays less taxes. So earlier, they were contributing to the health care of the less privileged through the public sector system. Today, they pay less tax and so contribute less, yet they have the civic amenities and food security. At the same time the middle classes fall sick less frequently as compared to the poor who now have to pay user fees and get fewer subsidies. So who is getting more exploited?

Secondly, what is health after all? Health, to me, is having a roof over your head, having a comfortable home, having an assured income, and drinking water, electricity, transport etc. This is the scaffolding on which health is created. And all these services come easily to the better-off who do not have to worry about these facilities. But, they are today not ready to contribute to the health care of the poor who face problems of access to these facilities as well as increasing costs of medical care.

To camouflage these distortions and to further the interests of the private sector through public-private partnership and the required shifts in the public sector, certain market-based economic principles are being put forward, such as the principles of quality of services, appropriate resources and efficiency. While quality is supposed to be better in the private sector, the lack of resources is said to plague the public sector making it inefficient as compared to the private sector. Last but not the least is the principle of nature of health services: a mix of public and private goods and not only the former. The drawbacks of the public sector mentioned above are said to be the

reasons for encouraging the public sector to collaborate with the private sector. It needs to be understood that health cannot be reduced into a commodity primarily distributed through the market. Health is a service and a basic human right in a civilized society. Health cannot be enhanced through market mechanism alone, particularly in Third World countries. This debate was there amongst the liberal economists way back in the 1970s and it was accepted that health is largely a public good. Today, the World Bank economists are digging that debate out and trying to prove that health care can be divided into areas, public and private, and thus accommodating the interest of the latter (Peters et al. 2002).

Efficiency in Public Health

Efficiency can be of service or of monetary management. This is something that we need to remember. If we want monetary efficiency, then yes, we cut back resource inputs, let people buy services and save funds to invest elsewhere. In a democracy however, the state is answerable to the citizens about how the taxpayer's money is being reinvested. If it is not reinvested for the welfare of the most deserving, directly or indirectly, that monetary efficiency is of no use.

The other problem in understanding efficiency is at the technical level. What do we mean by efficiency in public health? The efficacy of a drug lies in the degree of cure it offers. If it is very expensive, resources permit only very limited number of cures. What does that mean in terms of public health where we are talking of a billion-plus population and of changing or intervening in disease patterns? It means nothing. So with regard to technical efficiency, a major component is coverage of maximum possible population. Thus there is no point saying that your cure rates are increasing because cure rates are, "persons cured out of those treated", and when you cannot treat enough numbers then having an expensive or "difficult to procure" drug with high cure rates as the "Ram Baan" is not good enough. The important thing is the process of optimization where you cover the largest number using the minimum amount of money. Technical efficiency, therefore, is often achieved not with the best and most expensive drugs but with optimally effective drugs that are relatively cheaper and provide much wider population coverage. That is efficiency in public health. If you don't include coverage, and look at cure rates alone, then that is not public health efficiency.

There are other organizational problems as well. Cure rates and coverage alone are not enough. With vertical disease control programmes, personnel of five different organizations knock the door of a house five times, asking separately whether someone

is sick, dead or born or if the medicine is being taken. Is that efficiency? Can we not have regionalized, better integrated and efficient systems that use their resources efficiently? Earlier the system was expected to take care of the basic diseases at the primary level and the more serious diseases at the secondary and tertiary levels. By breaking down referral systems, the efficiency of the public sector has been severely compromised.

Quality of Care

Quality in medical care involves areas such as correct diagnosis, appropriate treatment, good management and scientific research to back these. It also includes professionalism in the team of workers and not in doctors alone. Research is almost absent in the private sector though institutions have come up in the name of research. Some examples are Escorts, Apollo and Sita Ram Hospitals, famous corporate institutions that are today influencing policy decisions for public health in this country, and of which at least two were set up as research institutions. They have produced little research. The notion of teamwork means respect, trust and collaboration between all members of the team. The evidence is that in the private hospitals, nurses, paramedical and the technical staff are exploited, they are not given their monetary due and are also made to sign on receipts for amounts that they are not paid. They are overworked and cannot protest because the day they protest, they are thrown out (Government of NCT Delhi 2001).

The WHO in 2001 introduced the notion of 'patient satisfaction' in assessing quality. We all-know that glib talk and hours of talking to a patient can still go hand in hand with misdiagnosis and maltreatment. This could happen in both public and private sector. But there is a system of peer pressure, greater monitoring and freedom of speech among team members in public sector hospitals. There are legislations, and the potential for creating pressure for implementation of better practices is greater in the public sector.

The issue of quality, therefore, is complex, and existing measures such as doctor-patient ratio or bed turnover rates are not adequate in assessing quality. At Escorts after a massive surgery, patients are told that your heart is now completely cured, and they are sent out after a very short stay as compared to the All India Institute of Medical Sciences where a similar case is kept for a much longer time. Obviously, the bed turnover rate is slower here and the hospital mortality rate is higher because this public institution is trying to give the best possible necessary post-operative care during the most vulnerable

period. The private hospital increases its bed turnover and profits as post-operative care is the least profitable period of indoor care, and it reduces its hospital mortality by early discharge when the probability of mortality is the highest. So which offers better quality service?

Lack of State Resources

It is tragic that we as a country can make a bomb and can spend 37 per cent of our national budget on defence, including buying caskets for corpses of soldiers who died in a war that was totally unnecessary. We also have resources for transforming Delhi for the Commonwealth Games—the new Delhi Master Plan, 2004, labels it as a ‘world-class city’ comparable to New York and Paris—yet there is no space in it for the poor who are being evicted and further marginalized. This is reflective of a mind set and not of shortage of resources.

The state’s foreign patrons are repeatedly saying that we don’t have resources, both material and technical, that we lack ability, knowledge and skills. This has seeped in to the extent that many have started believing it at the cost of their confidence and self-respect. India is one country where technical competence and skills are far from lacking, its professionals are not incapable people who cannot plan and think of complexities. They don’t need the World Bank and companies such as McKinsey planning for them (McKinsey 2002); and if that is what is happening today then the reason for this lies in the political economy of the present-day developmental paradigm rather than in the shortage of resources.

In the name of making services viable, three strategies have been adopted: cut-backs in the welfare budget, introduction of user fee in public hospitals and the selling of profit-making public sector drug industry. The consequences of these have been serious. While the overall decline in budget was at the root of the infrastructural decline discussed earlier, the introduction of user fee has restricted the access to even the little that remained of public sector services. It has marginalized the poor further as they cannot often afford the hospital fee. It has shifted the elite out of public hospitals to the private sector as the level of care in public hospitals deteriorates. As a result, the vocal user capable of demanding better quality services has now been shifted out of public hospitals. This is a disservice to the public sector, as it results in the loss of a mechanism for improving its service and state support to function effectively.

The Public-Private Partnership

In the 1990s, 36 multinational corporations (MNCs) came together in the West to work in the area of communicable diseases to relieve pain and suffering in the Third World countries. Their strategy was to give free services, free drugs to African and Asian countries. This was a way to gain popularity, get respectability and an entry to do their market surveys. Within two to three years the private practitioners become dependent on the free samples and since patients want quick treatment, the MNCs officially acquire a hold on the market. Over the 1990s many such global partnerships have come into being for vaccines and for drugs. Bill & Melinda Foundation is only one of them working in the area of vaccines and AIDS (Buse & Watt 2000). This focus on technology-oriented programmes has more to do with transfer of technology through markets rather than public health. It has made disease control an imbalanced activity as is the case of the Pulse Polio Programme in India. This donor-driven priority is based on single-technology-based programmes that are considered feasible while most other diseases requiring a complex strategy of intervention (where markets are not always relevant) are neglected.

A healthy partnership is based on shared objectives, equality and responsibility, but what is happening in the real world is something very different. In a genuine partnership both sets of institutions should have similar minimum standards, monitoring and regulatory mechanisms and they must contribute to setting up a database by pooling information in a common health intelligence system. All these are conspicuous by their absence. The private sector wants no regulation. Its supporters, in fact, demand that the public sector should act as a “steward” to the private sector and not as a regulator (WHO 2001). The assumption is that the state, by cutting at public sector subsidies, will make it a level playing field. However, the subsidies are actually getting transferred to the private sector in various ways mentioned earlier—exemptions on import duties, provision of land free of cost or at throwaway prices to set up private sector institutions, free medical education etc.

For example, in 1989 Escorts hospital was given free land to construct their corporate hospital on the condition that each year 25 per cent of their cases would be treated free. Fourteen years later in 2001 it was found that not more than 3 per cent of the patients had been treated free. Escorts preferred to purchase the land from the Delhi government and offer a price to the tune of 51 crore rupees (which was the cost of the land when they took it) rather than comply with the terms of partnership. The cost of the land in Delhi over these 15 years has sky-rocketed. Secondly, Escort ignores

completely the profits they earned over the entire period by not giving poor patients 25 per cent of their beds and free treatment. Thirdly, by denying the very validity of the lease conditions they absolve themselves of the penalty that must be imposed on them for dishonouring a government contract. This would be far higher than the sum they offered the government. This is the loss incurred by the public, and the state has quietly swallowed the loss. Can this be called a genuine partnership?

The state government of Delhi in the 1950s and 1960s had given private individuals free land to build charity institutions. The terms of partnership were very simple: that they would treat 25 per cent of the patients free of cost assuming they would be poor users. In 2000 when there was a public outcry about the working of some of these hospitals, the government of Delhi set up a committee to look at the problem of all hospitals given land leases by the government. Now this committee has in fact said that all corporate hospitals in Delhi are purely commercial ventures. They have no interest in the poor being served at the cost of their profits. They studied in detail 28 institutions that were given land as charity institutions. These institutions finally sold the land or converted them into commercial ventures. Some threw out all the old workers who were brought up in the spirit of service or charity and they wanted a completely new set of workers. This committee severely indicted these hospitals and came up with the suggestion that we need to re-state conditions, that we need to have regulatory institutions, and that we need to monitor the private sector (Government of NCT Delhi 2001). Four years of that and nothing has happened except for the corporate sector hospitals getting away with their profits. It is then for us to judge who is less ethical, more corrupt and inefficient and who needs greater control and regulatory mechanisms? Are partnerships possible without strict regulations?

This analysis shows that privatization and public-private partnerships in the health sector for human health have a tendency to work against the interests of the poor. If this is the trend in the case of humans, the most articulate and intelligent of the living beings then what would it be for mammals and birds that cannot protect their interest and protest against injustice? It is therefore important to remember that in poor countries scientists have to be judicious. They have to understand the market forces and their own reality, interpret both, and use science to protect those who bear the burden of the so called 'reforms'. I think that is what Anthra is doing in a very unique way and it needs to be acknowledged. One hopes that their work progresses, that they are joined by many more scientists and people and are able to build that much-needed bridge between public health and veterinary sciences for protecting lives.

References

- Buse & Watt (2000): "GPPP in Health". *Bulletin of WHO*, vol. 78, no. 4, p. 549.
- Dasgupta, R., and R. Priya (2002): "The Sustainability of Hepatitis B Immunisation within the Universal Immunisation Programme in India". *Health Policy and Planning* vol. 17, no. 1, pp. 99-105.
- Goenka, S. (2002): "Health Practices and Beliefs of Patients and Medical Practitioners in Relation to Diabetes". Unpublished Ph.D. thesis submitted to AIIMS, New Delhi.
- Government of India (1946): *Report of the Health Survey and Development Committee*. (Chairman Bhore). Vol. 1, pp. 10-11. Delhi: Government of India Press.
- Government of India (1961): *Report of the Health Survey and Planning Committee*, (Chairman Mudaliar). New Delhi: Ministry of Health.
- Government of India (2002): *Tenth Five Year Plan, 2002-2007*. Vol. 2, pp. 81-152. New Delhi: Planning Commission.
- Government of India (2004): *Annual Report 2003-2004*. New Delhi: Ministry of Health and Family Welfare.
- Government of India (2005): *National Rural Health Mission, 2005-2012: Mission Document*. New Delhi: Ministry of Health & Family Welfare.
- Government of National Capital Territory of Delhi (2001): *Report of the High Level Committee for Hospitals in Delhi* (Chairman Justice A. S. Qureshi). New Delhi.
- Hazard Centre (2003): *Delhi Kiski Hai*. New Delhi.
- Mahal, A., J. Singh, V. Lamba, A. Gumber, and V. Selvarajan (2002): *Who Benefits from Public Health Spending in India*. New Delhi: National Council for Applied Economic Research.
- McKinsey (2002): *Health Care in India*. A Report by CII-McKinsey. (Support from the Indian Health Care Federation). New Delhi: CII.
- Nagpaul, D.R. (1994): "Editorial: Surajkund Deliberations". *Indian Journal of Tuberculosis*, vol. 41, pp. 1-2.
- National Planning Committee (1948): *Report of the Sub-Committee on National Health* (Chairman S. S. Sokhey). Bombay: Vora.

- Peters, D. H., A. S. Yazbeck, R. R. Sharma, G. N. V. Ramana, L. H. Pritchett, A. Wagstaff (2002): *Better Health Systems for India's Poor: Findings, Analysis and Options*. Washington: The World Bank.
- Pollock, Allyson (2004): *NHS Plc: The Privatisation of our Health Care*. London: Verso.
- Qadeer, I., K. R. Nayar, and R. V. Baru (1994): "Contextualising Plague: A Reconstruction and an Analysis". *Economic and Political Weekly*, vol. 29, no. 27, pp. 2981-89.
- Qadeer, Imrana (2000): "Health Care Systems in Transition III. India, Part I: The Indian Experience". *Journal of Public Health Medicine*, vol. 22, no. 1, pp. 25-32.
- Qadeer, Imrana, and Anju P. Priyadarshi (2005): "Nutrition Policy: Shifts and Logical Fallacies". *Economic and Political Weekly*, 29 Jan., vol. 40, no. 5, pp. 358-64.
- Sathyamala, C., R. Priya, R. Dasgupta, and U. Mittal (2005): "Polio Eradication: Some Concerns". *Economic and Political Weekly*, 2 April, vol. 40, no. 14, pp. 1474-75.
- WHO (2001): "Report on WHO Meeting of Experts on the Stewardship Function in Health Systems", HFS/FAR/STW/00.1, Geneva, WHO.
- World Bank (1993): *World Development Report 1993: Investing in Health*. Oxford: Oxford University Press.

Questions and discussion

Prof. Rama Kumar, Retd. Secretary, Veterinary Council of India moderated the question-answer, discussion session.

- *Dr. Raghupathi (Senior Manager NDDB)*: Your presentation has a lot of value in it. However paraprofessionals can lead to quackery and finally farmers suffer as the production capacity of their animals reduce, lactation goes down, there are repeated inseminations etc. For example in artificial insemination there is no regularization for quality of semen and also no control through any authorized body. Paraprofessionals can strengthen the outreach of the public-health delivery system, provided there is a strong regulatory authority to monitor activities of paraprofessionals so that farmers benefit. If the services are priced, then these work efficiently. Whenever there has been a price, there has been more ownership. If the farmer has to pay, they will demand accountability for what they pay.

- *Dr. Padma Kumar (CALPI, Delhi):* It is important to distinguish farmers and poor farmers. In Kerala, while there is a very strong public-service delivery system, there are also private organizations—NGOs, producer organizations, and individual veterinarians—who offer services. Despite the strong state public-health care system there is enough space for private players too.
- *Dr. Sai Shekar (Animal Husbandry Department, Andhra Pradesh):* The government has handed over breeding operations through artificial insemination to private organizations such as JK Trust in Andhra Pradesh, in select districts. In fact, the government is paying the JK Trust huge sums of money for this service. They are collecting enormous amounts from the government. But in the public sector, even though supervision is good, resources are being cut. In the name of quality, there should not be a shift to privatization. Take the example of Chittoor Dairy Cooperative, which initially did very well but later collapsed after it was privatized. Private sector along with government is okay, but we should not encourage the dismantling of the public sector in the name of privatization, and thus cut resources available to the poor.
- *Dr. Vadlamudi:* In running Krishi Vigyan Kendras (KVKs), the ICAR contributed negligible amounts towards their running and upkeep. They are encouraging KVKs to enter into partnerships with the private sector, like with NGOs. After the creation of the VCI, the ICAR has become extremely negligent of the veterinary institutions and in developing the livestock sector.
- *Dr. Baig (Veterinary scientist, Jana Jagaran, Belgaum, North Karnataka):* Before joining the voluntary sector I worked for 25 years in an MNC pharmaceutical company so I know the inside story. Multinational companies provide all kinds of medicines to people—like oxytocin, antibiotics and their only aim is profits. There is a high level of mismanagement and absolutely no accountability in the private sector. Since veterinarians are keeping silent, people go to para-veterinarians for treatment, as the fee charged is less.
- *Dr. Anjaria:* There is urgent need for basic renovation in veterinary science.
- *Dr. Malik to Dr. Imrana Qadeer:* I must thank Dr. Qadeer for a fascinating talk. I would like to ask her, what are the possible remedial measures against the current trend? Today in our academic and research institutions, everything is getting commercialized and there appears to be no place for the moral and ethical values which existed when we were students. There seems to be a broad “consensus” that

the private sector is better in every way. If this trend continues, there will come a time when it will be said that we should shut down the public sector academic and research institutions.

- *Dr. Qadeer:* It is about time that we within the public-sector research institutions take a good look at our own institutions in terms of the courses we offer, our teaching and the research that we do. What are the courses we offer? What are the freedoms we give to our students to explore questions and issues? Most of our students come from middle-class backgrounds and they have never seen a village. We usually have extremely structured courses. But we should try our best within the existing structure to expose our students to the realities of the outside world. We should take them to the villages/slums so that students have a chance to be exposed and sensitized to the realities of people's lives and later on carry out research which is useful to poor people. We as teachers need to keep abreast with new literature—we don't go to libraries; we have stopped reading and updating ourselves. Instead, today research has become donor driven. Today donors with big money from Germany, Sweden and whichever country are keen to do joint research with our academic institutions and give us aid, and are very happy to be our collaborators as they want access to our knowledge and resources. We are neither proud of it nor protective of it. Today many researchers are reproducing research or are modifying old research, and are only interested in publishing their findings in international journals, because these are of high quality. But every researcher should publish their findings in Indian journals, so that then the standard of the latter automatically improves. Today increasingly research is being taken away from government universities and colleges and given to NGOs. If we look at research agendas, for instance, the sudden interest in our own traditional knowledge is because there is this growing interest in the West for herbal therapies. But within our own medical institutions how many actually treat other medical systems as equal partners? Thus we have funding coming in to explore identification of herbs so that these can be commercialized and sold instead of the local people being able to make use of this knowledge. We as scientists need to, within our public research institutions, think of all these issues—we can consider linking up our students and our research to select NGOs so that we can work with communities.
- *Prof. Sanjeev Ghotge to Prof. Ahuja:* You have said that subsidies are bad for market efficiency, and thus we need to cut back subsidies. However, what do you say about economies like the US and the EU who give massive agriculture subsidies, and then

in turn preach to us about cutting our subsidies because they are “inefficient”?

- *Prof Ahuja:* Subsidies are an instrument of development. The EU and US are effectively using subsidies to assist their farmers develop their agriculture. Our subsidy element is negative, and we have not been able to utilize it effectively.
- *Mr. P.T. Pandit:* We have to go to our indigenous knowledge for our own health. Important service sectors like education, human health and livestock health need far greater resources allocated from the state and central governments. Since majority of the food is derived from livestock, planning should be done to take care of livestock health care system. The corporate sector should not be subsidized as we heard is happening. Small farmers should receive indirect subsidy and large subsidies should be abolished. All PHCs should also include treatments using IK, which would reduce the costs.
- *Dr. Vadlamudi:* Though policies are made for poor farmers they do not benefit and only the bigwigs prosper. Instead of subsidy, the poor should be identified, and government and other concerned institutions should directly provide them money and free electricity.
- *Ms. Ashalatha:* What kinds of markets are you talking of: local domestic markets or foreign export markets?
- *Prof. Ahuja:* I mean both. Take the example of Bangladesh and the work done by an NGO called BRAC. The very poor female-headed households are trained to give vaccinations and do egg collection. BRAC the largest NGO in Bangladesh supplies vaccines and inputs.

As moderator of the session Prof. Rama Kumar gave his concluding remarks for this panel:

If there is genuine interest in improving the public-sector health delivery systems there are certain processes and approaches to be followed that I detail below:

- We analyse the communities’ needs.
- We analyse critical incidence that is the professional effectiveness and ineffectiveness.
- We do a task analysis, which will tell us what steps have to be taken to make corrections. We can widely think about applying SWOT principles. We look at the number of people we have and the infrastructure and the resources available.
- We need to then come up with a vision and mission statement.

- When we think of veterinarians they are team leaders who work with a team of para-vets. There is clear need here for role identification amongst the various actors, so that there is coordination and the system functions smoothly.

- We need to think of the support, supply and maintenance mechanisms in the system. Do we have these?

Do we plan our systems well?

Do we have answerability?

Have we built up the necessary management skills and capacities within our personnel?

Will all the above be answered by the simple idea of privatization?

Only if we do the above, will we be able to develop a holistic approach to veterinary services where everything has a role to play, such as:

- Providing primary veterinary services.
- Answerable support, supply and maintenance systems.
- A role for alternative indigenous knowledge systems therein.

Emerging issues

The privatization of the public-health delivery system in human health has failed miserably to improve the system of health care in this country for the poor. It has instead brought with it stagnation in vital human health indicators of progress and well being, particularly amongst the poor, and a huge breakdown in the referral system and systems of monitoring and controlling life-threatening diseases. Ironically the identical reforms, which were suggested and implemented in the human health sector, are being prescribed and pushed vigorously within the state veterinary health-care delivery system.

It is time that veterinarians and others concerned with the future of livestock in this country seriously analyse and challenge such health care reforms being promoted, particularly as they have failed so emphatically in the human health sector. One wonders if the same poor who were unable to pay for their own health, or have been pushed into further indebtedness due to their own ill-health, will really be in a position to pay for the health services of their livestock, no matter how close to the doorstep it is. We raise these issues in light of the oft stated reality that 80 per cent of livestock are owned by the poor—the marginal and small farmers—and the reforms being suggested are directly targeting these citizens of India to pay for something which is after all their due from a state concerned with the welfare of all its citizens.

What is also disturbing is the simplistic way in which alternative technologies are being cited as a magic pill and substantive option in place of a public health care system. For those of us who are practitioners of IK, we know very well that IK is being taken out of context and very misleadingly being projected as the “low-cost alternative” to a “high-cost” public health care delivery system. The reality is that both are necessary towards ensuring good health.

Introducing Ethno-veterinary Courses into College Curriculum

Rationale for the panel

There has regrettably been a complete silence within the existing veterinary undergraduate curriculum on indigenous knowledge and indigenous practices. Where it is mentioned, it is discussed disparagingly, highlighting superstitious practices alone, without discussing the strengths of IK. The positive results of our research at Anthra only further convinced us of the need for introducing IK to students through the formal veterinary curriculum.

We thus felt it was appropriate and timely (in view of the ongoing process of review of veterinary curriculum being undertaken by the VCI during 2004) to organize a panel to discuss the theme.

Ethnoveterinary Curriculum

V. R. Bhamburkar

Dr. Bhamburkar began by pointing to the fact that the existing BVSc and AH course already included several credit courses. The undergraduate faculty members were overburdened, teaching the existing course for seven hours a day practically each day. However, he highlighted the fact that within the existing curriculum there was scope for introducing IK practices to students in innovative ways. For instance, while discussing animal housing there was no need for teachers to insist on specific measurements and ways to build shelters, which in any case were impractical for poor farmers. Instead, they could study indigenous structures and suggest improvisation of existing structures. Ultimately all knowledge and information to farmers should help the farm animals and improve production. He suggested that a small group comprising Anthra members and scientists be formed that should come up with strategies to incorporate IK into the curriculum. Dr. Bhamburkar suggested that some of the unwanted curriculum could be deleted and this “must-know” IK information could be included in its place. Ethno-veterinary practices as they are cannot be included in the curriculum. It is possible that the ethno-veterinary course could be included in the postgraduate curriculum. In case of ethno-veterinary practices, initially one has to test the methodology to be adopted. Knowledge on herbal medicines could be accommodated in the existing *Materia medica* of the pharmacology course and then it could be included in the coursework at the graduation level. At the postgraduate level, research is already being carried out on the pharmacological properties of medicinal plants. He cited the example of his own university where under the ICAR-ITK (Indigenous Technology and Knowledge) scheme, a few experiments were being conducted on various ethno-veterinary practices. He felt only once these were studied in depth could the treatments be included at the undergraduate level.

Ethno-veterinary Education to Veterinary Professionals

D. Swaroop

Dr. D. Swaroop's power point presentation is given in annexure 6.

Dr. D Swaroop began by highlighting the history of animal husbandry in India which goes back some six to ten millennia. The ownership of livestock was of socio-economic and religious significance. Seals from the Harappan site depict domestic and wild animals, which underline the significance of animals in this early human civilization. During the Vedic period, people worshipped the cow and wars during that period were fought to protect animal wealth. There were different persons who had responsibilities vis-à-vis animals. There were animal healers who were usually priests, shangas who slaughtered animals, Barus who dissected and studied visceral organs, ashipus who were exorcists and treated cattle which became ill due to evil spirits, and Azus who treated animals. There was a well-developed veterinary care system that existed in ancient India. The first known veterinary doctor was Shalihotra (1800 BC). The first Ayurvedic medical school was started by Punarvasu Atreya (800 BC) and the first veterinary hospital was established during Emperor Ashoka's reign (238 BC). An advanced centre for research on toxicology and herbals existed in Taxila. One of the oldest manuscripts pertaining to veterinary science is the Asva Chikitsa, which is supposed to have been authored by Nakula, Shalihotra and Jayadatta.

India's livestock sector contributes significantly to people's livelihoods as also to the gross domestic product. However, low per capita animal production is mainly due to poor health and veterinary health care infrastructure, sub-optimal nutrition and consequently low reproductive performance. The current veterinary health care infrastructure in the country comprises over 50,000 veterinary institutions, including 7,415 veterinary hospitals, 19, 791 veterinary dispensaries and 23, 682 veterinary aid centers (catering to 7,000 animals per unit). Approximately one vet serves around 10,000 adult cattle in today's scenario. Apart from this, there are local/tribal healers (ethno-veterinarians) all across the country. There are more than 80 companies producing veterinary drugs in India. The total size of the pharmaceutical industry is estimated at Rs. 1,600 crore. The allopathic drug industry contributes Rs. 1,400 crore and herbal and ayurvedic formulations make up the balance Rs. 200 crore. Despite

this, there is a gap in demand and supply of veterinary health care products to the tune of Rs. 7,600-10,500 million (1996 estimate). Today there is growing popularity of herbal products for treating sick animals as most people consider plant formulations safe, eco-friendly, cost-effective and easily accessible.

Some of the limitations of modern animal health care systems are that the knowledge is derived from western inventions, is based on high-cost technology and is challenged with the frequent emergence of drug resistance. Developing new drugs entails huge investments and long duration. Modern drugs also bring with them the risk of environmental contamination, toxicity and drug residues. Some of the recent disasters have, for instance, been the negative impact of the drug diclofenac sodium, which has been identified as a major factor resulting in declining vulture populations in India.

There is a major gap in the existing veterinary health care infrastructure, which is a crucial constraint in improving the livestock sector. Veterinary care reaches only 20 per cent of livestock owners. Primary health care centres are in a deplorable state of neglect. There is a gap between demand and supply of animal health care products. The annual expenses on veterinary drugs and biologicals are less than Rs. 13 per livestock unit (L.U.). Finally, traditional healers are rapidly disappearing.

Ethno-veterinary remedies have the potential to address some of the problems highlighted above. However, in order that this happen there is a need for validation and standardization of effective herbal remedies, drug interaction and toxicity evaluation of medicinal plants, identification and developing of sources for quality raw materials, and the need to identify disease conditions where ethno-veterinary medicines (EVM) and herbal drugs can be used effectively by farmers themselves. There is also a need to establish a central apex body to guide research needs, regulate quality standards and registration procedures for veterinary herbal drugs. Courses on ayurveda/herbal therapy can be introduced at the undergraduate and postgraduate levels. There is a clear scope for enhancing India's current share of Rs. 4.36 billion in the global herbal export which stands at Rs. 30,000 billion. Nearly 25 per cent of conventional drugs are plant derived. Medicinal plants are the main component of EVM. For instance, more than 90 per cent of 595 ITKs documented under NATP (National Agriculture Technology Project) are plant based. The herbal pharmaceutical sector outlay is only 12.5 per cent of the total veterinary pharmaceutical industry. Regarding research on the veterinary herbal remedies, the World Bank funded a NATP (Mission Mode) to document 595 ITKs. Most of those found effective contained one

or more plant ingredients. Another NATP catalogued 158 plants and evaluated 50 for anti-parasitic activity. The Indian Veterinary Research Institute produced and released its first herbal drug for commercialization, available under the brand name Onilall.

Coming to the applications of traditional knowledge within the existing veterinary education system, Dr. Swaroop first outlined the existing structure. The Veterinary Council of India basically regulates the veterinary education and curriculum. There are 34 veterinary colleges and six veterinary universities in India. There is one national institute (the IVRI) and various animal species specific ICAR institutes. There are some 36,000 professionals and over 1,600 veterinarians are added annually.

The BVSc and AH course includes 83 courses with a total of 194 credit hours. The course is spread across nine semesters and a 180-day internship. The distribution of credits across courses is: basic – 22.16%, production – 24.23%, preventive – 18.56%, technology – 3.10%, public health – 4.12% and therapeutic subjects – 27.83%. There is currently no course on alternative system of medicine or ethno-veterinary medicine. Currently there is no formal degree/diploma/or courses on alternative systems in the BVSc curricula. In the medical sciences there are numerous courses and degrees and separate institutes/colleges available for all these alternative systems.

There is a need to provide basic knowledge and training to veterinary professionals on various aspects of ethno-medicine, ethno-pharmacology and ethno-botany. These would equip the veterinary graduate to effectively use traditional methods of treatment and enable them to cater to the growing Research and Development needs within the emerging area of herbal medicine. Knowledge of the old Indian tradition of healing will facilitate the development of appropriate and acceptable technologies more suitable to our farming system and animal health, and may help to achieve sustainable farming and cost-effective veterinary technologies in view of SPS/HACCP regulations. Farmers can get cost-effective, eco-friendly, safe, easily accessible indigenous veterinary drug/treatments.

Dr. Swaroop felt that recommendations should be made to the VCI to revise the existing BVSc and AH course curricula so as to include basics of ethno- botany dealing with toxic and medicinal plants in the first semester (course No. VLM113 – fodder production and grassland management may be modified). A course on phytochemistry validation methods and the use of EVM for treating diseases could be included in the seventh and eighth semesters by suitably modifying existing courses VPT-411 (chemotherapy) and VCM-421 (clinical medicine). Of the 180-day internship, one

month should be set aside for practical training on identification of medicinal herbs and their uses, and interaction with tribal healers to learn some effective ITKs like the detection of Surra (trypanosomiasis) by the Raika pastoralists.

He concluded by saying that national institutes and veterinary universities should initiate 9 to 12 month specialized postgraduate diploma courses in EVM. Old books like *Materia Medica, Treatise on Treatment* by Srinivasan, and recently published books by Anjaria et al. and NATP ITK documents may be used as reference texts to develop literature. Expert inputs from IVRI, veterinary universities and NGOs like Anthra, Jagaran Vikas Kendra (Udaipur), Shalihotra (Khargon) and SRISTI (Ahmedabad) could be obtained to modify/ develop suitable modalities and course programmes.

Ethno-veterinary Medicine in Veterinary Curriculum

D. Rama Kumar

Prof. Rama Kumar's power point presentation is given in annexure 7.

Prof. (Dr.) Rama Kumar stated that EVM refers to people's knowledge, skills, methods, practices and beliefs about the care of their animals (McCorkle, 1986) and not limited to the use of herbal or indigenous drugs on animals. Formal introduction of EVM by the same name in veterinary curriculum needs be considered in the light of the present curriculum, the legal implications, and usefulness of EVM to animals and the animal-owning public. He said that some professional (veterinary) groups are not very positive about EVM and equate it with quackery. Others do appreciate the observations made, but want to test EVM before they use or advocate it. Yet others consider it as a reasonable option where cost or lack of access precludes the use of "more safe and effective modern pharmaceuticals".

Referring to the legal perspective, Prof. Rama Kumar said that as per the provision of Section 30 of the Indian Veterinary Act, 1984 (52 of 1984) no one other than a registered veterinary practitioner [a person(s) whose name is for the time being borne on the Indian veterinary practitioners' register] shall provide veterinary service, if EVM becomes a part of veterinary practice. Currently the study of indigenous drugs, plant drugs with proven pharmacological and therapeutic efficacy, and popular indigenous drugs are part of the BVSc and AH syllabus. The syllabus also includes conventional and non-conventional animal rearing patterns in rural and urban areas, conventional feed ingredients and their economic, health and psychological impacts. Therefore there is no legal hitch in the use of indigenous medicine or conventional AH practice as part of (veterinary) professional service. However, the use of ayurvedic or homeopathic drugs prepared and used under those systems can not legally be part of veterinary practice as currently vets are not formally trained in the ayurvedic/homeopathic systems, and until such drugs are validated under modern medical systems. As per a verdict of the Supreme Court of India a person not trained in a particular system of medicine is not entitled to practice that system and can be identified as a quack.

Prof. Kumar said that the argument to encourage EVM as a cheaper alternative and in situations where regular veterinary service is not available or feasible appears logical. But it need not be uniformly true in actual practice. He referred to a debate in the earlier session on privatization of veterinary practice and added that studies have shown that 44 per cent of the expenses for treatment in a veterinary hospital are spent on the cost of medicines and consumables and not on the fee or salaries of professionals. Packed indigenous medicines are not always cheaper than branded allopathic drugs, and quacks tend to use these materials and techniques without any training, knowledge or rationale. The so-called advantage of ethno-veterinary practice remains elusive and can abet abuse of drugs by quacks and untrained persons. Only materials usable by owners as (non-invasive) “home remedies” should be allowed in the best interest of the animals and the clients. There are indigenous substances that need be used with caution, and techniques in alternative systems that are ethically unacceptable.

Abuse of drugs and emergence of resistant strains of microbes are possible from unsupervised drug delivery. But a more serious problem is that it can disable the identification and recording of the occurrence of diseases or their possible increase and perpetuate a wrong message of wellness, thwarting preparedness and undermining the role of professional service. Out of nearly 800 million livestock in India, 90 per cent are distributed across 13 to 15 states/union territories. That is, 90 per cent of the cattle, buffalo, goat and sheep population are distributed in 11 states of India and 90-91 per cent of poultry and pigs are concentrated in 13 and 15 states respectively. The problem of inaccessibility is acute in areas where animals are sparsely distributed; this aspect needs special attention.

The identification and evaluation of home remedies and conventional AH patterns of each region (micro-region) is an important task facing professionals. Aspects like cost break-down study of AH practices of each region; factor productivity; sustenance; residue freeness would have to be tested. For holistic Animal Resource Development (ARD), marketing of products will have to be viewed against the future prospects, feasibility, primary input requirements, WTO/GATT agreement, global market trends and possibility of scaling. Studies must include:

- role of EVM in mainstream veterinary health care
- whether EVM can take the place of primary health care, under supervision and guidance

- whether EVM can replace ambulatory clinical service and outreach
- whether EVM can be a support service or a speciality service
- which kinds of primary ailments/ diseases can EVM address

Prof. Kumar emphasized that to support EVM, the veterinary curriculum needs to be constantly strengthened by a sound and consistent National Veterinary Research Policy. The components of such a policy should include region-wise research on conventional animal husbandry practices, human power and human resource development (HRD), infrastructure development, implementation of current technologies and new skills. He suggested that research and training be dovetailed to service (possibly by establishing an Indian Council of Veterinary Research, ICVR). Besides developing as a subject, research in ethno-veterinary studies must include:

1. Region-wise research on EVM including traditional home remedies and conventional animal husbandry practices
2. Human power and human resource development (specific HRD training)
3. Infrastructure development
4. Use of current technologies and new skills to support EVM and vice-versa
5. Co-ordination of research and training to be dovetailed to service
6. Development of a composite information management system (National Animal Production and Health Information System- NAPHSIS) on EVM

Questions and discussion

There were numerous suggestions about the possibilities of including ethno-veterinary courses into the existing curriculum:

- Dr. Anjaria supported the inclusion of EVM in the curriculum. He shared how he had developed an ayurveda curriculum for a six-month certification course for the Gujarat Ayurveda University, and sent it to the VCI for approval. However, he had still to receive a green signal from them. He also suggested that EVM could be offered as an elective course. He mentioned that in the internship programme, students could be taught about EVM. He felt groups like Anthra should work closely with the AH departments at the district level to share and disseminate information and approaches in IK.
- Dr. Pandit felt that ethno-veterinary courses could be included in the postgraduate programme, but at the undergraduate level it would put a lot of pressure on

students given the existing VCI syllabus. The performance of students who are under the VCI syllabus is worse compared to non-VCI students; therefore he suggested excluding EVM for undergraduates.

- Many veterinarians' used to study herbal medicines during the 1980s, but nowadays veterinarians' are not aware of this knowledge, so the Animal Husbandry Department should arrange a meeting for sharing this knowledge. Emphasis should be given to indigenous knowledge. The use of different parts of the plant should be taught to students. It was the responsibility of professors to motivate students to collect medicinal plants/and prepare herbariums.
- Most veterinarians are underutilized. Their skills can be used to study the local knowledge systems around them, in the areas where they work.
- From the class 8 onwards, basic animal-plant co-relation should be taught. During summer vacations children should be given small projects (learning by doing) to collect live herbaria, try out home remedies etc., for which they should be given marks.
- Dr. Sai Shekar felt it was not possible to integrate EVM courses at the undergraduate level, but possible at the postgraduate level in pharmacology.
- Dr. B. K. Singh felt that most vets do not work to their potential. They have to be taught to provide their services at the doorstep of the poor.
- Dr. Swaroop reiterated that all vets are not the same. He used to treat 20 to 25 animals a day earlier. Even now, the clinic gets 40 to 60 cases each day. Top quality services have to be provided.
- Dr. Raghupati from NDDDB suggested that the ethno-veterinary course can be offered as an optional subject as part of the masters degree programme. It should be included as a compulsory course in MVSc pharmacology.
- C. R. Bijoy pertinently remarked that it is important not to reduce indigenous knowledge to merely veterinary herbal products and herbal medicines. By doing so, veterinarians will be really limiting their own role. For if IK is reduced to narrowly referring to herbal medicines and treatments, then there is actually no need for veterinarians—because any pharmacologist/chemist can as well do this job. Thus while understanding the role of IK and when thinking in terms of introducing the course into the college curriculum, it is imperative that veterinarians bring in the perspective of IK, as also the broadest role it can play within the context of strengthening the public health service system.

- Dr. J.K. Malik stated that there is already a course on pharmacology of indigenous plants and plant toxin/pharmacological properties of important medicinal plants. He also mentioned that countries like Italy, UK and USA are realizing the importance of ethno-veterinary/traditional practices. The syllabus needs to be updated. The Veterinary Council formulates the courses, so these issues need to be brought to the notice of the VCI. Textbooks have to be revised appropriately.
- *Dr. Sagari Ramdas:* We again want to reiterate that Anthra's research only highlighted that IK clearly has a particular role but in no way is it a panacea for all problems. Further, in no way does Anthra argue that IK can replace the urgent need for strengthening the public health service system. Also our fear is that IK constantly gets reduced to medicinal plants alone, without realizing that IK encompasses a very holistic approach to health. It is these perspectives which urgently need to be introduced into the curriculum.
- *Dr. Nitya Ghotge:* Our research raised many issues. In the process of our discussions, we hoped some solutions would have materialized, but the old questions remained, while new issues have cropped up. Veterinarians prefer only the glamorous biotechnological aspects of medicinal plants. They are seldom exposed to the 'reality' of rural areas. What does the curriculum actually teach them? The real issue is: how does science cater to the poor?
- Dr. Malik appreciated how Anthra, without wasting time in the inaugural session, started scientific presentations almost immediately; he suggested that this was as good a forum to come up with recommendations which could be sent to the VCI.

Emerging issues

The session ended with a decision to set up a Working Committee to evolve a set of recommendations and a resolution for introducing ethno-veterinary knowledge into the existing undergraduate curriculum addressed to deans of various veterinary colleges as also to the VCI. The Working Committee consisted of the following persons:

- 1. Dr. Anjaria, Retd. Professor of Veterinary Pharmacology, Gujarat Agricultural University*
- 2. Prof. Rama Kumar, Retd. Secretary, VCI*
- 3. Dr. Bhamburkar, Dean, Nagpur Veterinary College*
- 4. Dr. J. K. Malik, Professor and HOD, Veterinary Pharmacology, IVRI*
- 5. Dr. D. Swaroop, Professor and HOD, Veterinary Medicine, IVRI*
- 6. Dr. Sai Shekhar, Assistant Director, SMILDA, Directorate of Animal Husbandry, Andhra Pradesh*
- 7. Dr. Anjiah, Dept of AHD, Andhra Pradesh*
- 8. Dr. Chandana Barua, Associate Professor, Assam Veterinary College*
- 9. Mr. Pandit, Yashwant Rao Chavan Pratisthan*
- 10. Mr. C. R. Bijoy, independent researcher*
- 11. Dr. Sagari R. Ramdas, Anthra*

The resolution is given in annexure 15. Dr J. K. Malik was to subsequently present the key recommendations of this panel at the conference of deans and national seminar on “Quality Assurance in Veterinary Education in India: Issues and Strategies”, to be held at Pantnagar on 24 and 25 September 2005.

There seemed to be an overwhelming demand for introducing these courses in the veterinary curriculum, as was clear from the resolution passed.

Presentations of Technical Papers

This was an open session for participants to present their research papers. There were five power point presentations.

Presentation 1 **Studies on the Effect of Hyptis Sauveolens as an Acaricide by Dr. Kala Kumar Bharani, Dept. of Veterinary Pharmacology, Veterinary College, NG Ranga Agriculture University** (Power point presentation in annexure 10)

Presentation 2 **Ethno-veterinary Practices among the Tribals of Orissa by Dr. G. S. Parida, Department of Medicine, Faculty of Veterinary Science and Animal Husbandry, O.U.A.T., Bhubaneswar** (Power point presentation in annexure 11)

Presentation 3 **Need for Validation Models for Anti-allergic Drugs by Dr. Chandana Choudhary Barua, Associate Professor, Dept. of Pharmacology and Toxicology, CVSC. AAU Khanapara, Assam** (Power point presentation in annexure 12)

Presentation 4 **Survey on Ethno-veterinary Medicine Practices in Yaks in Arunachal Pradesh by Dr. F. A. Ahmed, Arunachal Pradesh** (detailed paper is given in annexure 13)

Presentation 5 **Participatory Assessment Model on Ethno-veterinary Practices: Need and Significance by Mr. Raneesh Santhanakrishnan, FRLHT Bangalore** (detailed paper is given in annexure 14)

Dr. N.P. Dakshinkar, Dr. S.N. Patil, Dr. C.R. Jangde, Dr. M.S. Dhakate, Nagpur Veterinary College, MAFSU, Nagpur also made presentations.



Gymnema sylvestris



Acacia nilotica



Cochlospermum religiosum

Bio-patents and Bio-piracy

Rationale for the panel

Through Anthra's work with indigenous communities and other peasant communities that rear livestock we recognized that indigenous knowledge systems, while playing a major role within community livelihoods, were simultaneously being rapidly eroded and lost from within the common community experience. We observed a breakdown of transmission of oral traditions of knowledge and loss of associated genetic materials, with obvious negative effects on community livelihoods. Fewer and fewer farmers were actually using this knowledge. The change was most visible in the agricultural and medicinal plants sectors where people had rapidly converted their production to green- revolution type capital- and chemical-intensive cropping and technology use. The commodification of medicinal plants had resulted in huge and excessive sales of valuable plants at throwaway prices, depriving local communities of their right to use the plants. Further, the inherent threat of oppressive forest and land laws continued to threaten the indigenous communities, who were constantly engaged in a struggle against these.

At about the same time, international interest in these issues was heightened with the introduction of TRIPS (Trade Related Intellectual Property Rights) which relates to the patents for seeds, genetically modified organisms (GMOs), plant varieties, biotechnology products and processes, as well as entire areas related to health, medicines and vaccines in the Uruguay round of Negotiations of GATT. There was a flurry of activity in the international and national arenas, to "manage" and "protect" traditional knowledge and its associated biological diversity through bringing these under the patents and IPR frameworks and regimes through numerous international and national treaties. Initially it was difficult for small groups like Anthra to understand the implications of these major international treaties. It was only when there was a massive hue and cry over patent regimes and we began to follow, analyse and study the implications of these in the context of our own ongoing work with peasant and indigenous communities that we realized that most of these treaties were discriminatory toward the rights of developing countries, and within these countries even more discriminatory towards poor and marginalized groups.

*While working with these groups we also noticed that it was rare that an individual or even a small community exclusively knew the use of a particular life form. Most often this knowledge was reasonably widespread, across a cross-section of healers, across a section of knowledgeable farmers, across village, district and often even state borders and boundaries. We found that uses are common across continents too. Turmeric is used to heal wounds in distant Jamaica and Trinidad just as custard apple, a native of South America, is a well-known medicinal plant in India, used widely by local communities to treat maggot wounds across India and South-East Asia. While uses have been modified by the community in different areas, other uses are known to have travelled across continents with immigrants centuries ago. We found this to hold true in healing practices, in the use of fodder, in local breeds and crops. For instance, goat farmers all over India feed both leaf and pods of *Acacia nilotica* tree to goats. Similarly the Deccani sheep valued for its hardiness, drought resistance, wool and meat production, are reared by shepherding communities in Andhra Pradesh, Karnataka and Maharashtra. Which community then would stake its claim for patent rights on the concerned genetic material and how would one define the exclusive community in this attempt?*

Who then has a right to file for patent use? Who determines this right? Who grants the patent? By accepting patent regimes for biodiversity use, do we run the risk of being discriminatory, or of perhaps depriving someone equally deserving of their due share? If we talk about equity and open knowledge systems, can we afford to do that?

We felt strongly that existing debates on protection of IK and biodiversity did not provide sufficient space for debating different positions. Most often there appeared to be a general broad-based acceptance that the only way to protect this knowledge was to follow the international patent and IPR framework path. But our own field experience of eight years clearly challenged this framework.

It was also true that rarely were veterinary scientists ever exposed to these debates and different world views. In fact with the increasing interest being placed on research on IK, scientists within the system were being told about the need for Indian scientists to file for patents on documented IK. They were never really exposed to the other world view. We thus felt it was necessary to deepen our understanding of this highly complex issue, by organizing a panel which brought together proponents of the IPR framework as also those who challenged it.

Knowledge: Practical, Classical, Scientific

Madhav Gadgil

Prof. Gadgil's power-point presentation is given in annexure 8

Prof. Gadgil described how at different stages of technological development (hunter-gatherer, agrarian, and industrial) there have been different forms of conservation practices and mechanisms for their implementation. He said that each stage had its own systems of restricting access to knowledge (intellectual property rights), which in the earlier stages was through trade secrets and today in the form of patents. The Biological Diversity Act was enacted to promote conservation, sustainable use and equitable sharing of benefits of India's biodiversity resources. Towards this, certain new institutions were to be established such as the National Biodiversity Authority (NBA), State Biodiversity Boards and Biodiversity Management Committees at the level of panchayats and municipalities.

The role of these different bodies would be to devise strategies, plans and programmes for conservation, sustainable use and equitable sharing of benefits of India's biodiversity resources (including preservation of habitats, conservation of cultivars, domesticated breeds of animals and micro-organisms). For this purpose, the Act promoted good documentation of biological diversity, its uses and associated knowledge at all levels. The knowledge of local people associated with biological diversity should be respected, protected (possibly through a sui generis system), and registered or chronicled at local, state or national levels.

The Act has also set up procedures for regulating access to biodiversity, its associated knowledge and benefit sharing. Requests for accessing biological resources or knowledge associated thereto for research, or for commercial utilization, or for bio-survey, are to be examined by the state/national biodiversity boards in consultation with the concerned biodiversity management committees. At the local body level, the biodiversity management committee has the authority to decide on levying of collection fees for accessing biological resources from within their jurisdiction. The Act also ensures equitable sharing of benefits arising out of the use of accessed biological resources, their by-products, innovations and practices associated with their use and applications and knowledge relating thereto in accordance with mutually agreed terms and conditions between the persons applying for such approval, local bodies concerned and the benefit claimers. Regarding Intellectual Property Rights and benefit sharing, requests for IPRs based on any research or information on biological resources of Indian origin will be

examined, and then appropriate benefit-sharing fees or royalty or conditions for agreeing to intellectual property rights claims will be decided. In return, the Act states that the foreign partner must ensure appropriate transfer of technology, appropriate location of production, research and development units, and appropriate association of Indian scientists, benefit claimers and local people with research and development in bio-resources, their bio-survey and bio-utilization.

The implementation of what has been outlined requires a sophisticated and well-designed Biodiversity Information System (BIS) for India with knowledge base for the three-tier management system (national, state, local). There is a need to safeguard the interests of all those who will contribute information to, as well as access information from BIS. Information may be classified as:

- Local vs. national
- Confidential vs. publicly accessible

Examples of these are:

Local and Confidential: For exclusive use of, and accessibility only to local community and confidential information made available to the NBA.

Local and Public: Information, which the community wishes to share freely as also synopsis of confidential information.

National and Confidential: Derived from local, scientific, industry sources with access given only with consent of and on terms specified by information providers.

National and Public: Synopsis of confidential information and information of public interest, especially with respect to public domain knowledge.

Thus information would be shared at different levels: some would be completely open, some open only to local communities and yet others partially restricted/or shared only under certain conditions.

Prof. Gadgil went on then to talk in some depth about the roles, rights and responsibilities of the biodiversity management committees as described in section 41 of the Act. Every local body shall constitute a biodiversity management committee (BMC) within its area for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticated stocks and breeds of animals and micro-organisms and chronicling of knowledge relating to biological diversity. The main function of the BMC is to prepare people's biodiversity register (PBR) in consultation with local people. The register shall contain comprehensive information

on availability and knowledge of local biological resources, their medicinal or any other use or any other traditional knowledge associated with them. He also described certain institutional processes by which these registers should be prepared. He stressed that PBRs need to be continually updated as databases were not just one-time written or printed documents and required constant updating.

Prof. Gadgil said that new commercial applications are still being developed based on folk traditions. However, medicinal plants markets continue to be largely informal with only 10 per cent of species under cultivation. Harvests of less than 10 per cent of species are regulated by forest departments.

There are two clear reasons why knowledge has to be documented. The first is on account of assertion of intellectual property rights, pertaining to drugs, vegetable dyes, bio-cosmetics as also genetic resources of domesticated plants and animals. The second is for promoting conservation and sustainable use. This also includes ecology and management-related knowledge and practices.

Prof. Gadgil then dwelt a bit on the concept and practice of prior informed consent, an important feature of the Convention on Biological Diversity (CBD) as also the Biodiversity Act. Registering “knowledge associated with biodiversity” was an important objective. In the process it was important to respect people’s intellectual property rights and inform them fully of IPR provisions and only record such information as they wished to provide, agreeing to any restrictions on its sharing that they stipulate. Before documenting, it was important to formally execute a “Memorandum of Agreement” to specify conditions under which various items of information were being shared and documented. He then cited an example of such an MOU which was drawn up between a group of scientists from the Centre for Ecological Sciences at the IISc, Bangalore, and several herbal medicine dispensers of Mala village, Karkala taluk of Udupi district in Karnataka.

He then presented the design, in the pipeline, of the Biodiversity Information Management System to manage information at the national, state and local levels. Currently a consortium consisting of several groups such as the National Innovation Foundation, FRLHT, NISCAIR, NBPPGR and NBAGR are working jointly on such a system. He said Anthra would need to work out a more substantial programme towards this.

Prof. Gadgil ended by stating that this was a great opportunity for nation building—a scientific enterprise that brought together the growing technological competence within the country and the folk ecologists.

Bio-patents and Bio-piracy: Controlling Life

C. R. Bijoy

If I want to slap you, anyone of you, I should have a reason to slap you. So for every act, for anything and everything that I do, I need to justify the act to myself. Therefore it is necessary for me to gather information selectively. It is necessary that I interpret information conveniently, so that I may justify my act.

There is a community in the Western Ghats called the Kurumbas. All other tribal communities fear the Kurumbas. It is believed they have some secret knowledge which is very destructive. They have a herbal preparation with which they can make sure that you die and you die a very painful death. This is a very popular belief. There is a very famous area, which lies near the place I refer to, called the Silent Valley.

This forest was once a sandalwood forest, and you can imagine the kind of sandalwood mafia, the numerous murders and criminal activities that occur in such an area. A number of us discussed this and decided that we would approach these Kurumbas and ask them to use their medicinal knowledge against these extremely criminal elements selectively so that we could clean up the area! The Kurumba medicine man refused. So we tried to find out why he refused. He didn't tell us. He kept on refusing. After a lot of persuasion, which lasted a few months, he finally decided to get rid of us. He said, "Look, I can use this herb only against the members of my own community and not on any other community." The criminals were basically non-tribals. Then we asked him why he could use it only against his own community? He answered: "It is because only our community has an antidote for that medicine! Other communities don't have an antidote."

We have perfect gentlemen and gentle ladies who believe in law and order and are very law abiding. You can have good laws, bad laws and ugly laws. Irrespective of the character of the laws, the next issue is how the law gets implemented. A law comes into play in society only when some people or some processes assert the law. As long as that assertion is not there, the law does not play in society. Society functions on the basis of social practices. And social practices are passed down, get transformed through history. Therefore, there is absolutely no guarantee that a good law will lead to good results.

In fact, look at the images that we know. If a group or an individual bombs a hospital, we call them terrorists; but if the American air force bombs the hospital, we call them coalition forces! Fighting the market is "terrorism", and probably liberating that country using force, is "creating democracy". So images can be very deceptive.

With this I basically would like to go through some information, all known and in the public domain; nothing secret about it! You also know many of the conclusions from this information. Some of the conclusions may be shocking or contradictory to popular images, which are related to the persistence of various interest groups selectively leaving out information to legitimize their interests and their actions.

When somebody in the United States, once wanted to purchase land from the so called “Red Indians”, Chief Seattle, a Native American leader in the 1800s, said “How can you buy or sell the skies, the warmth of the land, if you do not own the freshness of air and the sparkle of the water? How can you buy that? Man did not weave the web of life, he is merely a strand in it”. This statement is not just an argument. It stems from a certain understanding of life, a certain understanding of natural phenomena, nature and relationships.

Biodiversity

Biodiversity is “the variation among living organisms from all sources (land, water, air), including diversity within species, between species and between eco-systems”. The term “biological diversity” is commonly used to describe the number and variety of living organisms on the planet. It is defined in terms of genes, species, and ecosystems that are the outcome of over 3,000 million years of evolution.

The human species depends on biological diversity for its own survival. Thus, the term can be considered a synonym for “Life on Earth”.

If you look at the extent of recorded knowledge, knowledge that is recorded by literate society, it is estimated that there are probably five million species, or more likely there are a 100 million species and probably there are 300 million species of which only about 1.7 million are recorded by modern scientists. Half the world’s forests are located in the tropics. Fifty to ninety per cent of all plant and animal species are native to the tropics which constitute 13 per cent of the land area [56 per cent of this area lies in S. America, 26 per cent in Asia and 18 per cent in Africa]. Seventy per cent of the 3,000 plants identified by US Cancer Institute are native to the tropics.

So essentially what we need to understand in order to understand the politics related to biodiversity and of patenting etc., is that half the world’s forests are in the tropics – South America, Africa, South Asia, South-East Asia and about 90 to 95 per cent of all species are in these tropical regions.

Do you know that 92 per cent of food crops come from the tropics? Thirteen hundred plants are known to the Amazonian Indians of South America. There are 1,650 species which have potential as food. Of the 250,000 flowering plants a mere 3,000 have been used for food purposes throughout human history. Of these, only 200 are domesticated, only 15 to 20 are crops of economic significance and most of them are from the tropics.

It is very strange and very interesting if you look at indigenous peoples or tribal/ adivasi communities and start listing the kind of food materials they use. On an average, they normally consume some 150 food materials. If you look at our own consumption patterns how much would it be? We would probably not consume more than 50 food materials. That is all we consume. And we are still learning from these indigenous communities what to eat and what not to eat. Even with regard to common food items, you find that the knowledge that is inherent in traditional communities is much vaster than what modern science has discovered. For example, except for the Australian Macadamia nut, all nuts and fruits were originally grown by indigenous people. Tea, rubber and coffee all came from indigenous people, who are otherwise considered ignorant, backward, uneducated, uncivilized and almost living an animal life. What kind of image do we have of tribal communities? If you look at what we consume and assume that consumption of or knowledge about food is a criterion of progress of civilization, then we ought to be asking ourselves the question as to just how civilized are we and whether we ought not to be at the lowest level of the civilizational ladder.

The WHO (World Health Organization) estimates that 80 per cent of the world's population, or 4.3 billion people, rely on traditional plant-based systems of medicine for primary health care. Less than 1-2 per cent of the world's 250,000 flowering plants have been analysed for medicinal value; only between 5-15 per cent of the approximately 250,000 higher plants have ever been investigated for bioactive compounds, with about 155,000 seed plants in the tropics alone. Over 35,000 plant species worldwide are being used across various human cultures for medical purposes. Less than 1 one per cent of indigenous cultures have been surveyed for their knowledge of medicinal plants and other natural products. Success rate for new drugs from randomly synthesized chemicals is only one in 10,000; but the average success rate for identifying useful medicines from plants is one in 125.

Yet, western pharmacotherapy has been dominated by the preference for prescribing purified chemical compounds. Many are synthetic analogues built on prototype compounds isolated from plants.

But 25 per cent of all prescriptions dispensed in the US and Europe contain active substances derived from plants of tropics. Sixty per cent of the therapeutics molecules/products in the global pharmaceutical market are of plant origin. Sales of plant-based drugs in the US alone were estimated at US\$ 15.5 billion in 1990. Global over-the-counter sales of plant-derived drugs are estimated at US\$ 40 billion per year. Benefits derived from saving lives of people afflicted with cancer in the US using plant-based drugs are about US\$ 250 billion annually.

Sales of herbal medicine alone are estimated to have exceeded US\$ 12.5 billion in 1994 and US\$ 30 billion in 2000, with annual growth rates averaging between 5 to 15 per cent. In 1990 more than 2000 companies in Europe alone were marketing herbal medicines, with 30 per cent having a turnover in excess of \$20 million. In 1995 the so-called “nutraceuticals” sector—consisting of herbal medicines which are dubbed food or dietary supplements in order to by-pass FDA criteria more easily—is now estimated to be valued at US\$ 27 billion.

Therefore global trade of medicinal plants is over \$60 billion per year. The FAO estimates that between 4,000 and 6,000 species of medicinal plants are traded internationally, with China accounting for about 30 per cent of exports. In 1995, medicinal plant exports from approximately 100 countries were US\$ 880 million (UNCTAD). The total import in 1980 of “vegetable materials used in pharmacy” by the European Economic Community was 80,738 tons. India was the largest supplier by far, with 10,055 tons of plants and 14 tons of vegetable alkaloids and their derivatives (WWF). Asia leads in the supply and consumption of medicinal plants, followed by North America. Germany dominates the European trade in medicinal plants, importing plant material from over 100 countries and re-exporting one-third of it as finished products.

Intellectual Property Rights

Basically IPR gives protection to people who want to make use of knowledge for personal profit. And essentially the notion of IPRs emerges from notion of property rights. Interestingly, ownership of land is a novel concept. And interestingly, in India we still do not have ownership rights to land. We do not have a law in this country which confers you ownership to even an inch of land. It is the State who owns the land. The “patta”, the title that you get merely identifies you as a revenue payer of that piece of land and therefore enjoyment rights. It doesn't confer you ownership.

But popularly we think that we are the owners of the land on which we hold the title. What I'm saying is that the law also can be popularly misinterpreted and therefore social practice is largely related to the interpretation or rather the misinterpretation of the law.

Intellectual Property Rights provides the legal protection given to persons over their creative endeavours. They usually give the creator an exclusive right over the use of his/her creation or discovery for a certain period of time. Intellectual property protections may include patents, copyrights, trademarks and trade secrets. Intellectual Property is codified at an international level through a series of legally binding treaties.

Prof. Madhav Gadgil also mentioned article 8(j) of the Convention on Biological Diversity, which specifically talks about indigenous and local communities and their traditional lifestyle and practices. In fact, practices are integral to lifestyle and are not to be understood as separate from lifestyle.

IPRs are also linked to territorial rights. These international rights are not obligatory. They are not binding, in the sense that the UN cannot haul up a country for not abiding by them. It can only report and make recommendations. IPRs have legal validity to the extent that all nation states are expected to modify their national laws in conformity with these emerging international standards and norms.

The Convention on Biological Diversity (CBD) 1992 is an international treaty resulting from the Earth Summit in Rio de Janeiro where world leaders agreed on a comprehensive strategy for sustainable development. The CBD establishes three main goals in order to maintain the world's ecological resources:

- the conservation of biological diversity
- the sustainable use of its components
- the fair and equitable sharing of the benefits from the use of genetic resources.

To date, 179 countries have ratified this agreement.

I am not going into the Biological Diversity Act, which Prof. Madhav Gadgil has adequately dealt with.

Then there is TRIPS, which essentially says that countries may exclude plants and animals from patentability. It may exclude essential biological processes for the production of plants and animals from patentability. Countries, however, must allow patents on micro-organisms, patents on non-biological and microbiological processes for the production of plants and animals, provide for the protection of intellectual

property on plant varieties either through patents or effective sui generis systems. Then there is also a timeframe by which national laws are to be changed to TRIPS guidelines. The essential aspect of TRIPS is that this is something that is going to be implemented. Unlike the UN declarations this has much more weight. All the systems are in place to ensure that countries conform to these TRIPS arrangements and agreements, whereas for the UN-related agreements, mechanisms for implementation are conveniently not in place. There are a whole range of IPR-related legislations and treaties that exist at regional, sub regional and national levels.

So there are a lot of legal systems already in place, or are going to be in place, or are going to be modified so that everything is uniform across the world. We have the Indian Copyright Act, 1957 (as amended up to December 1999) [Subject matters: Copyright and Related Rights; Date of basic text, June 04, 1957; Date of entry into force of basic text, January 21, 1958; Date of latest amendment, December 30, 1999].

The Trade and Merchandise Marks Act, 1958 (No. 43 of 1958) (As amended in June 1st, 1979) [Subject matters: Marks; Date of basic text, October 17, 1958; Date of entry into force of basic text, November 25, 1959; Date of last amendment, June 01, 1979 Officially published in “The Gazette of India”, 1959, p. 583 & 02/06/1975, No. 26, p. 279].

The Patents Act, 1970 (No. 39 of 1970) [Subject matters: Patents; Date of basic text, September 19, 1970; Date of entry into force of basic text, April 20, 1972; Officially published in “The Gazette of India”, 21/09/1970, No. 43].

The Patents (Amendment) Ordinance, 1994 (No. 13 of 1994) [Subject matters: Patents; Date of basic text, 1994; Date of entry into force of basic text, January 01, 1995; Officially published in “The Gazette of India”, 31/12/1994, No. 81].

International Copyright Order, 1991 (as amended in 1999 & 2000) [Subject matters: Copyright and Related Rights; Date of basic text, 1991; Date of latest amendment, 2000].

The Trade Marks Act, 1999 (No. 47 of 1999) [Subject matters: Marks; Date of basic text, December 30, 1999; Officially published in “The Gazette of India”, 30/12/1999, No. 60].

The Geographical Indications of Goods (Registration and Protection) Act, 1999 (No. 48 of 1999) [Subject matters: Appellations of origin/geographical indications; Date of basic text, December 30, 1999; Officially published in “The Gazette of India”, 30/12/1999, No. 61].

The Designs Act, 2000 (No. 16 of 2000) [Subject matters: Industrial designs; Date of basic text, May 25, 2000; Officially published in “The Gazette of India”, 12/05/2000].

The Semiconductor Integrated Circuits Layout-Design Act, 2000 (No. 37 of 2000) (4th September, 2000).

Biological Diversity Act, 2002 (No.18 of 2003) (5th February 2003).

We do have a lot of acts and these are also getting modified.

Now the major advantage of patents is that the person who patents has a monopoly over its use and over the name of the product and there are potential profits. Disadvantages of patents are that after a certain period, we disclose the details so that it will be available in the public domain. The criteria for a patent are: novelty, in terms of new use, non-obvious for someone skilled in the art, i.e. not simply an extension of something that already exists but which requires an inventive step; novel, i.e. not previously known; industrially applicable (or useful) in some way. Patents are, in part, incentives and rewards for inventions. Please remember this. They are designed to encourage commercial innovations while allowing the knowledge behind them to be shared. Patents give inventors a temporary monopoly over new inventions, which they can commercially exploit, in return for publishing information about the invention. In this way, inventions do not “die with the inventor”, and others can try to invent something better, but sufficiently different so as not to infringe the claim of the original patent. A patent right lasts for a fixed time (20 years minimum under the TRIPs Agreement, a long time given the pace of technological change) after which anyone can use the invention. The precise terms applying to patents vary from country to country, and patents only apply in the country/countries in which they are granted.

Patents are based on notions of individual property ownership, a concept that is often alien and can be detrimental to many local and indigenous communities, which also leads us to the question that if a country has a law, it does not mean that the law is going to be uniformly followed or enforced uniformly. If you look at our country, the North-East is the only place in India where land and forest do not belong to the state. It belongs to the community—collective ownership. The only other place amongst Asian countries where forests do not belong to the state is the tribal part of Pakistan. So you have different notions of relationships to natural resources, relationship to land. So even legally there is a lot of diversity. It is not a uniform, monocultural world.

Now, we come to bio-patents. Bio-patenting is basically patenting life or living organisms. The first such patent was given to a person called Chakravarty, for his bacterium that eats crude oil, in 1980. By 1985, genetically modified plants, seeds and plant tissues could be patented in the US. Initially, Europe was hesitant to adopt the pattern but they gradually agreed. Statistics prior to 1997 revealed that 57 per cent of prescribed drugs in the US are derived from biological sources. The remaining 43 per cent were synthetic compounds, which may or may not have been inspired by traditional healers. By 1997, the patenting system had progressed further to allow animal patents. The U.S. Patent and Trademark Office (PTO) began granting animal patents in 1988. Sixty-nine animal patents were issued in the US by 1997. These include mice or rats that have been genetically altered to mimic human conditions or diseases; a nematode (round worm), two avian species, one rabbit, a sheep, a guinea pig and a fish. With cloning technology such as the transgenic sheep, more patents have been issued. Just three companies hold over 25 per cent of all animal patents—Gene Pharm, International Systemics, Ontario Cancer Institute.

Let us also look at the whole issue of food security and food sovereignty in the context of patents and IPRs. The pertinent question is “Will bio-patented crops help feed the world?”

Data shows that the net exporters of food are also countries where tens of thousands of children are dying of starvation. We have Brazil, which is the third-largest food exporter of the world. About 100,000 children die of hunger every year in Brazil. Decades after the green revolution, Brazil, India, Ethiopia and Thailand, among others, have shown that increasing food production at national level is no guarantee for food security at the local level.

Clearly, hunger is not due to lack of food but is caused by both the highly unequal distribution of wealth and the huge number of people who are landless. Adopting a purely “technology can fix it” approach to hunger problems can create more hunger and more food at the same time. Bio-patenting, in fact, is now an added cause of increased hunger. If you look across countries with the latest statistics you find that the extent of starvation, hunger and hunger-related problems and deaths are also increasing in United States. So there is absolutely no scientific evidence to prove that patenting does help solve the problem of food security. It has got nothing to do with availability of food. It has basically got everything to do with inequitable distribution of food.

In India we have surplus food. We have donated hundreds or probably thousands of tons of food, for example, to Vietnam. Finally the People’s Union for Civil Liberties

had to go to the Supreme Court to say people are dying in our country of hunger, while the Food Corporation does not have place to store food. The Supreme Court has now ruled that people cannot die of hunger. They have constituted a Commission headed by S. R. Sankaran of Andhra Pradesh and now they are going to appoint Food Advisors in every state to ensure that the state provides food to the hungry.

The argument often given is that bio-patents will reduce the cost of production and will result in cheap food being made available to the poor people. However, all evidence indicates that with the intellectual property regime in place, with bio-patenting in place, the cost of food production increases so much so that food shall not be cultivated by farmers. It shall be the business of agribusiness. Patents can be anti-competitive. It can promote monopoly, drive up costs. When Cargill introduced hybrid sorghum into Karnataka in 1993, the income of farmers' declined. Although the average production per acre was Rs. 3,600 per acre compared to Rs. 3,200 per acre using traditional seed, the cost of production had risen to Rs. 3,230 per acre from Rs. 370 per acre. Patents can have anti-competitive effects by securing and strengthening the position of market leaders and limiting the entry of new competitors. This promotes monopoly and drive up the cost.

If you look at the main arguments for intellectual property regimes and patents, it is related to the fact that for doing research you need money. People who have put in efforts should be compensated. Indigenous or traditional people who share their knowledge have to be monetarily benefited. Does patenting really provide the incentive? You have to ask the question: what has patenting achieved.

Most patents have been used to ensure that others do not produce the product that you have patented. It is to ensure that others do not produce certain competitive products. It is this negative use of patent that is currently popular.

About three-quarters of the active ingredients in modern prescription drugs came to the attention of researchers because of their use in traditional medicines where notion of patenting is non-existent. The current value of the world market for medicinal plants derived from materials utilized by indigenous communities is estimated at US\$ 43 billion annually. The value of crop varieties developed by indigenous communities for the modern seed industry is estimated at US\$ 15 billion a year. Asian farmers have developed over 140,000 rice varieties. There are also enormous profits generated from the use of countless other plants found in indigenous communities which now go into the manufacturing of fabrics, perfumes, sweeteners and cosmetics.

There is no historical evidence to prove that patenting promotes research or promotion of the production of new knowledge. Patents are used to prevent competitors having an advantage. Patents even slow the pace of innovation if a dominant firm possesses a powerful tool of patent which limits the ability of other firms to improve existing profits. Patenting denies the right of people to produce knowledge. It is to ensure that production of knowledge is an exclusive preserve of the rich. Patents are costly—\$ 5000 to 10,000 or more. If patenting is to be the main incentive for production of knowledge or of research, then how is it that these traditional communities have produced so much knowledge? What were their incentives? Was it cash incentive? Was it an incentive of profit? Do we have historical evidence to prove that monetary benefits on patenting have indeed been the driving force of production of knowledge in societies? An estimated 30,000 plant species have edible parts but just three—wheat, maize and rice—supply more than half of the world's food. Eighty per cent of patents on genetically modified (GM) food are borne by only 13 multinational companies. Bio-patents threaten 1.4 billion farmers in the developing world who currently depend on the same seed for the next crop, which they will not be able to once the patent regime is fully in place.

The North hold 95 per cent of the world's patents, but interestingly most of the available biodiversity (95 per cent) is in the South. More than 75 per cent of agricultural crop varieties and over 50 per cent of domestic livestock breeds have disappeared with the dawn of modern scientific knowledge. In Thailand and Burma, 40 per cent of the total rice area is taken up by only five varieties. In Pakistan, five varieties account for 80 per cent of the total rice. In Cambodia, just one variety of rice accounts for 84 per cent of the area under rice.

In USA the patent law is used in two ways. One is in disputes over the exclusive use of a particular gene sequence. The other is essentially the use of patents that cover an entire market in an apparent effort to drive all competitors out of the market or at least create a strong negotiating position for licensing agreement. The top 10 seed companies control 33 per cent of the 23 billion seed market and you have numerous data on this.

Bio-patents will cause bio-piracy. It will control and eliminate farmers. It controls food chains, promotes monopoly. Bio-patents will prevent the free exchange of seed varieties, deprive farmers of their right to breed their own varieties, facilitate and consolidate corporate control over agriculture, provide incentive to invest in biotechnology and encourage bio-piracy.

What is bio-piracy? It is the theft of biological matter and its related knowledge. According to the UNDP, bio-piracy refers to theft through use of bio-patent of the intrinsic worlds of diversified species and the community rights and innovations of indigenous people. It is in contravention of the Universal Declaration of Human Rights and the various other UN-related laws. It is also in contravention of the internationally recognized laws on farmers rights.

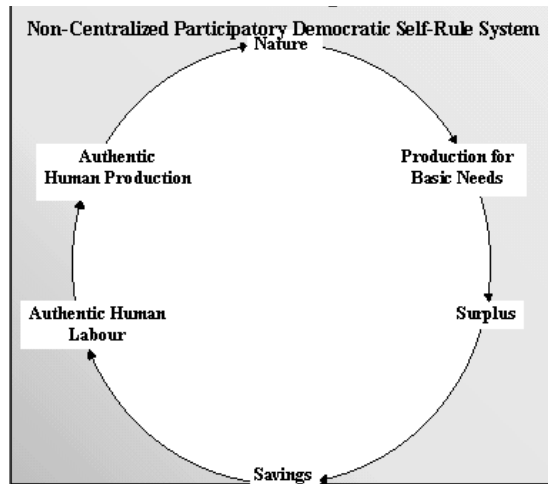
The wealth of genetic material and the intimate cultural knowledge of the properties of plant species amongst local populations have meant that an estimated 83 per cent of efforts to locate and exploit new species—a process known as bio-prospecting—occurs in the South.

Now who are the bio-pirates? They come in all forms. As scientists, business people, researchers, entrepreneurs, government officials, social workers, development workers, mafia, criminals, your neighbour! There are enough documented experiences of bio-piracy that have occurred in different parts of the world. I've just listed a few from Africa: Brazzeine, a protein 500 times sweeter than sugar from a plant in Gabon, Teff, the grain used in Ethiopia's flat "injera" bread, Thaumatin, a natural sweetener from a plant in West Africa, the African soap berry and the Kunde Zulu cowpea, genetic material from the west African cocoa plant; the Hoodia cactus from the Kalahari desert used for centuries by the San people of Southern Africa to stave off hunger and thirst, and so on.

There have also been attempts to counter some of this bio-piracy. We have the famous disputes currently on turmeric, neem and basmati. Despite these, the fact is that hundreds and thousands of normally used materials and knowledge have already been patented. It is almost impossible for anybody in this country to go and fight these cases in a court in the US. In fact, a patent lawyer is one of the highest paid. Who has the money to fight the cases? This is the age of negotiations and collaborations.

What we need to understand in order to make any assessment, any law, any regime, at any point of time of history, is to understand the political economy of the production of knowledge.

I've outlined a model. It's called the non-centralized, (not decentralized), participatory democratic self-rule system. This is the system that is currently available and followed by communities, either in its full form or probably in its fragmented form both in developed and underdeveloped countries. This is not fiction. This is life.



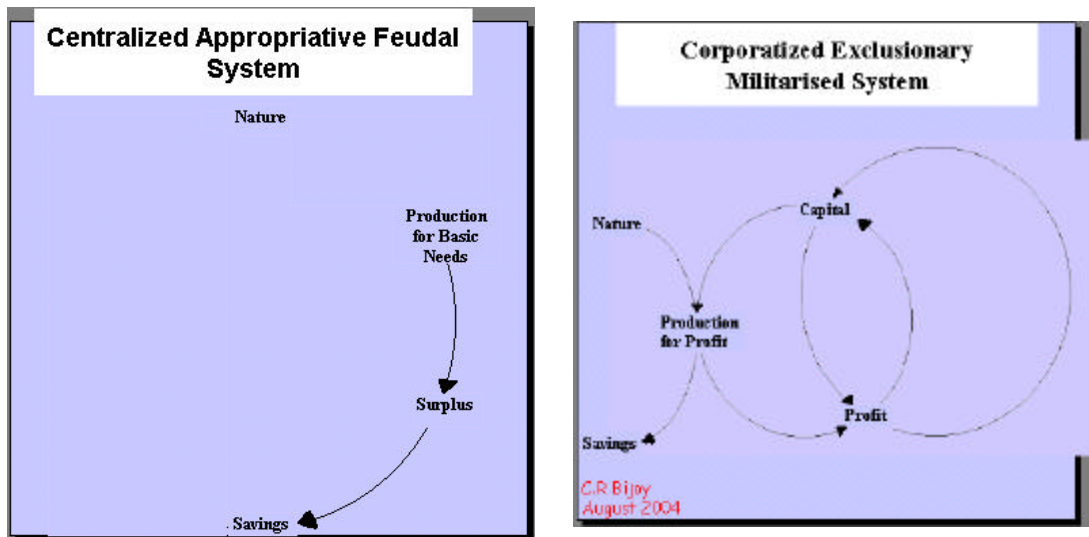
Now, here is a system where the people have a particular kind of relationship to nature, the relationship they have with their mother. Land is perceived in many communities as divine. So it's that kind of a relationship which determines the manner in which people make use of nature. There are a whole complex set of laws and norms related to the way in which people in the system relate to nature. And these make them believe that nature is their mother. Whatever they do to nature will be what they do to their mother. And therefore when a hunter is about to hunt a deer, first of all, the hunter prays to the spirits, prays to nature asking for pardon and then hunts. The hunting also follows certain laws regarding when to hunt, where to hunt, what to hunt, what not to hunt. After hunting, the meat is not owned by the hunter. The community owns it. So there is no ownership of the products that they produce. You produce only for your basic needs. And in the production system there is a certain element of surplus and savings, which gives you time to reflect upon your day-to-day experiences. At that particular point of time, they use their authentic human labour to produce authentic human products. Now when I say authentic, it means it will be the knowledge, and the products arising out of that knowledge, having a quality that reflects the relationship of that community with nature. It shall be knowledge or a product which shall not create disharmony in the community. It shall not be against ecology. It shall not be against nature. It shall not create inequality within the community. So if it is knowledge related to say a song, that song is not to be sung by an expert. It is to be sung by the whole community. If it is a dance, the whole community dances. Thus community knowledge is created, in a song sung by a tribal community. Who created the song? Who is the patent holder or copyright holder for that particular song? So the product

of your labour, not only your physical labour but also your mental labour does not belong to you. It belongs to the community.

Therefore the product by itself should not be the main point of interest for those of us who are trained in modern science but the systems within which this kind of knowledge is produced. And precisely because of this kind of relationship among people within the community, between community and nature, and precisely because of a particular kind of relationship that existed, this community has tremendous knowledge.

It is said that Dhanvantari provided the knowledge of ayurveda. Why Dhanvantari? There is a reason why Dhanvantari was conceived. It is no different from what we are currently doing, knowledge prospecting. Write a paper; copyright it and then I'm the owner of that piece of knowledge. So do we attribute the papers we write to something, which we have uniquely discovered? Have we not taken the assistance of the whole history of civilizations behind any paper we write? How can we own it? This notion of appropriating and expropriating knowledge emerges in a different system, which is called as the centralized appropriative feudal system.

In the next schematic figure you find the whole left side of the circle missing. The authentic human labour, the authentic human production component vanishes.



It is substituted by a different system. No longer are communities related to nature. When I say related to nature, if it is land, it means that you belong to the land; the land does not belong to the community. People belong to the land: The land does not belong to the people. In the new system, people are removed from land. Certain sections control nature. As long as nature is Mother Goddess, it is divine. You cannot control nature. Therefore you have to conceive of the notion removing divinity out of nature. That still does not give human beings the right to control nature. So you create God in human form. Then because God is the creator and since you are almost like God in human form, you can control nature. So in human civilization these notions got created and along with that the knowledge of communities also got appropriated. Next you did not want to acknowledge that this is the knowledge of the people and therefore you have to create a fiction that some divine power has created this knowledge which was handed over to the people.

The final schematic system is that we are living in today which I call the corporatized exclusionary militarized system. Here production is for profit, capital is reinvested to make profit, and in fact there is a complete divorce from the land. Profits can be made by sheer reinvestment of capital, which gathers its own momentum and spirals into larger and larger wheels.

Plundered Commons and Legalized Robbery Vishwas Deviah

Mr. Deviah began his presentation with a poem in English.

*The law locks up the man or woman
Who steals the goose from off the common
But leaves the greater villain loose
Who steals the common from off the goose.*

*The law demands that we atone
When we take things we do not own
But leaves the lords and ladies fine
Who take things that are yours and mine.*

*The poor and wretched don't escape
If they conspire the law to break;
This must be so but they endure
Those who conspire to make the law.*

*The law locks up the man or woman
Who steals the goose from off the common
And geese will still a common lack
Till they go and steal it back.*

– Anonymous

Eighteenth-century England and Europe witnessed one of the bloodiest transitions—that of the dispossessing a large majority of people from the common land and turning such lands into private property through the enclosure movement. These enclosures are an epitome of double standards which unveil the state machismo concealed in the very law that dictates our conduct. The remnants of the past are reflected in the struggles of the communities to retain their identities. Their struggle depicts ravenous state-aided conversion of the commons into private property. The governments nationalized and sold common land to wealthy landlords. By birthright, the commons had been open to the entire community, which lost access to grazing lands, medicinal plants, non-cultivated foods and fuel wood. Driving millions of Europe's indigenous peoples to become mass labourers and thus aiding the capital owner to bloat in his new found

power. As we learn of the past where the state defined and enforced property rights to promote certain interests or sections, we get to unpack the mysteries of the present.

The enclosure movement imposed a devastating cost on one segment of society; it was the revolution of the rich against the poor. They literally robbed the poor of their share in the commons, tore down houses which, by previous unbreakable force of custom, the poor had long regarded as theirs and their heirs'. The fabric of society was disrupted. Desolate villages and the ruins of human dwellings testified to the fierceness with which the revolution raged, endangering the defences of the country, wasting its towns, decimating its population, turning its overburdened soil into dust, harassing its people and turning them from decent husbandmen into a mob of beggars and thieves. Though this happened only in patches, the black spots threatened to melt into a uniform catastrophe. It subjected the peasantry to the relentless power of the market logic, disrupting their traditional social relationship.

Even as land enclosure was taking place in Europe, a new system of knowledge enclosure was underway. In Britain, between 1770 and 1850 almost 12,000 patented inventions were financed by the wealth stolen through land enclosures. Today the patent enclosure system has spread to all of biological diversity.

The response of the state on the pretext of bio-piracy is nothing short of the enclosure of intangible commons of the mind. Things that were regarded as common property or at least uncommodifiable are being brought under property rights. The holders of traditional knowledge are increasingly being subject to market logic as they are being introduced to the language of the market on the pretext of securing distributive justice for the unauthorized use of their knowledge over the biological resources of their surroundings. The most sweeping bio-piracy coup occurred when the CBD set the starting date for national sovereignty over genetic resources at 1993. That meant that all the resources collected and banked in countries in the North—regardless of their source—belonged to the countries that housed them. The CBD, by asserting the sovereignty of a state over the genetic resources found within its borders, effectively encloses the genetic “commons” state by state and subverts the human rights of indigenous peoples and communities. Although the CBD pays lip-service to the communities' role in access and benefit sharing, this can be negated by national law. The pressure to conclude bilateral contracts with intellectual property provisions means that communities are encouraged to end customary systems of exchange, damaging their own resilience. The newer systems of market interventions heaped upon the communities only aids in destruction of the common pool resources. They extend

from seed exchange restrictions to confining seed sale to market system, thus, displacing the farmer from his community knowledge base and then from his ecosystem.

Commercialization and property law go together under which the simplest act of picking leaves in forest which is a customary right of some of the indigenous communities could become a theft, like the laws in eighteenth-century England. Forests have already been taken over by the state through legislation. The state has taken away the customary right of the communities to get access to the forest produce, by legal mechanisms or for that matter in the classical way of usurping the common land from the panchayats.¹

Bio-piracy: Two negative impacts

Conventions and legislations have been brought out to address the problem of bio-piracy. Some understand bio-piracy to be the act of collecting biological material from a local group of people without the consent of the people or when there is no agreement to share the financial profits that may derive from the collected material. Those who share this view of bio-piracy see IP protection as a useful weapon to combat it, with the hope that the appropriating party will be legally bound to share profits at the local level. Some are even of the opinion that bio-piracy leads to the loss of opportunity for Indian entrepreneurs to commercialize products in domestic and foreign markets as the technology may be based on Indian knowledge.

Narrow definitions of bio-piracy based in the context of Intellectual property have allowed corporations to interpret the various legislations from the market perspective. Increasingly, the language of the laws have been rewritten to regard bio-piracy as the loss of economic opportunity, and the solution mooted to set right this great loss is to allow privatization of indigenous knowledge in exchange for some money. A great deal of “sensitivity” is shown by using the term “benefit sharing”. Interestingly enough, the biotech companies which misappropriate the indigenous knowledge get away with it through the legalization of their actions. In short, the state seems to be saying “I will legalize theft provided you pay me a certain amount for allowing privatization of indigenous knowledge”. Once we start looking at organisms as bank accounts, then we are missing the entire view of what is in front of us. Curiosity of the living world ends and so does the meaning of being here.

¹ Himachal Pradesh Village Common Land Vesting and Utilisation Act of 1974

Biodiversity Convention

The richness and greatness of the diverse ecosystems is under threat from CBD which intends to exploit this richness. This will trigger an irreversible destruction of this diversity, not only the diversity of plant species but the diversity of ecosystems, cultures and cultural knowledge systems as well. The Convention on Biological Diversity, which entered into force at the end of 1993, has been hailed for having established in international law the need for a “fair and equitable sharing of benefits arising out of the utilization of genetic resources.” The reality, however, is that the text of the CBD and later interpretations of the text formulated at subsequent Conference of the Parties (COP) negotiations have upended the CBD’s stated aim. The CBD is not about equity but about facilitating legal access²—mainly by corporations from the North—to the genetic resources and knowledge of indigenous and other traditional peoples, mainly in the South.

The facilitation is furthered by the fact that the CBD, although a multilateral agreement, strongly encourages bilateral deal-making and commercial exploitation of biodiversity. The implications of the concept of “benefit sharing” within the CBD cannot be fully appreciated if separated from this emphasis on bilateralism. The CBD states that access to genetic resources “shall be facilitated” (Art. 15.2) and that states are the designated entity authorized to determine the conditions for this access (Art. 15.1) under an over-reaching claim that a state has sovereignty over the genetic resources found within its border. The apparently reasonable statement that states have sovereign authority over their own genetic resources ignores the pre-CBD reality. The majority of the known genetic resources and associated knowledge originated and is still present in situ in the political South. However, thanks to the march of conquerors and diverse “scientific” expeditions, more than 75 per cent of all ex-situ resources (resources that have been collected and banked) are present in institutions such as botanical gardens, aquariums, zoos and microbial collections in industrialized countries. For example, England has collected samples of a plant that is found in Peru. If the plant turns out to cure cancer and if scientists in the Netherlands develop it into the blockbuster

² Article 15 (1) Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation. (2). Each Contracting Party shall endeavour to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose restrictions that run counter to the objectives of this Convention.

drug-of-the-century before Peruvian scientists do, then it's obvious enough that the question of benefits sharing doesn't arise as it was in the possession of England prior to CBD. The botanical chess game that colonial powers have played since the time of Columbus has finally been formalized, legalized and legitimated through the CBD. But beyond that, these genetic resources were not in the state's domain previously, and most importantly, they were not for sale. They were public and collective goods, albeit in whatever form, exchanged and shared, developed and nurtured by farmers and indigenous people over thousands of years for the welfare of their own communities and, as a consequence, the welfare of communities throughout the world.

Furthermore, the same knowledge and resources may be present in more than one country, as eco-regions and traditional cultures do not necessarily coincide with modern geopolitical divisions. Modern states are often hostile to indigenous peoples, farmers, fishing and other local communities living within their borders. States have a poor record vis-à-vis respecting the rights of indigenous cultures so that further plundering is likely to be perpetrated by the indigenous peoples' "own" state.

It is commonly believed that the CBD will help prevent these abuses by recognizing the rights of traditional people who will be consulted on the use of their resources and knowledge, mainly through Article 8(j). Article 8(j) states that: "Each Contracting Party shall, as far as possible and as appropriate, subject to its national legislation, respect, preserve, and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourages the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices".

In fact, 8(j) could be a good article, but it has serious flaws. The most obvious is the inclusion of the clause "subject to national legislation," which appears throughout the text of the CBD (as well as other multilateral agricultural and environmental agreements). The clause leaves it up to each state to enforce the article, which, in many cases, renders it useless in its entirety.

Bio-prospecting or benefit-sharing contracts encourage communities, groups or individuals to participate in commodifying and selling the commons and collective heritage, pitting them against the same people or inhabitants of the same region. Such contracts not only legitimize robbery but also erode the resilience of communities of

the people.³ Consider the cultural wealth lost to the market system when members of an indigenous people or a rural community begin to see their traditional knowledge and the nature around them not as the bases for life and health, but as merchandise to sell before their neighbors get the chance. “Thus, contractual benefit sharing is like waking up in the middle of the night to find your house being robbed. On the way out to the door, the thieves tell you not to worry because they promise to give you a share of whatever profit they make by selling what used to belong to you.”⁴

Over ten years have passed, since the CBD entered into force. The Convention’s stated aims are the “conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.” Despite these laudable aims and the sincere efforts of indigenous peoples, civil society organizations and some government delegates, the Convention is, in fact, less about protecting the wealth of nature and the custodians of biodiversity than it is about protecting the wealth of the few powerful economic actors in the gene business. Rather than safeguarding genetic resources, the Convention’s particular notion of “benefit sharing” and the interpretations that have been formulated subsequent to the Convention’s adoption have provided a legal framework for plundering resources and knowledge through the legitimization of intellectual property on life forms. As importantly, the CBD’s endorsement of bilateralism through contracts has also legitimated and facilitated bio-piracy.

This only goes to show that the commons are slowly and surely being privatized as well as shrinking into oblivion. The vesting of control and access of biological resources and knowledge in the hands of the state, its consent to privatization of such resources are reminders of the making of the working class (proletariat) who were systematically unseated from their original setting, deskilled and reduced to an unskilled labour pool. The international and state legislations, be it the CBD, the Biodiversity Act or any other armoury of the state, all train their guns at the commons, which are being systematically plundered, while comforting the commons by saying that “robbery of resources is a fact of life, like progress and science; it can’t be stopped, so lets face the inevitable and

³ Section: 6 (2) : The National Biodiversity Authority may, while granting the approval under this section, impose benefit sharing fee or royalty or both or impose conditions including the sharing of financial benefits arising out of the commercial utilization of such rights.

⁴ Alejandro Argumedo

try to get something out of it. Let's become merchants instead of victims, and do it before our neighbours do."

- Protection is not about paying fees as compensation, but about respecting and restoring the right to land, territory, resources, identity, and diversity and about ending the privatization and monopoly of resources through IPs, new technologies or other enclosures.
- "Nothing in these Guidelines should be interpreted to affect the sovereign rights of States over their natural resources." (I.A.4)
- "Competent national authorities ... may, in accordance with applicable national legislative, administrative or policy measures be responsible for granting access ..."(II.B.14)
- "Relevant stakeholders should be consulted and their views taken into consideration in each step of the process ..." (III.18)

The Guidelines reaffirm the CBD's declaration that the authority to negotiate the commercialization of resources lies in the hands of the state. State sovereignty establishes the enclosure of resources at the national level, giving biodiversity actors only a "consultative status." In reality, these actors are dispossessed of their effective right to say no. Governments can either look for other willing communities or choose to ignore their wishes after 'consultation.' Often, national governments are hostile to the interests of the indigenous peoples living within their borders.

- "Restrictions on access to genetic resources should be transparent, based on legal grounds, and not run counter to the objectives of the Convention" (IV.C.26.c.)
- "Providers should ... strive to avoid imposition of arbitrary restrictions on access to genetic resources." (II.C.16.c.ii)

The Guidelines fail to acknowledge that there may be other kinds of grounds—such as ethical and cultural grounds that are probably not recognized by national legislation—based on which it would be legitimate for indigenous peoples or others to restrict access to genetic resources. The state is being warned here that it must make its resources available and respect IP and contract law in the spirit of trade liberalization. Referring to biodiversity actors (or even states) as "providers" implies, grotesquely, that biodiversity's function is to supply "users" in a commercial transaction.

While privatization and commercial overexploitation of the resources are the real problem, indigenous peoples, farmers, etc. are offered "capacity-building" to facilitate their own participation in the process that devastates their livelihoods and cultures.

- Regarding distribution of benefits: “benefits should be shared fairly and equitably with all those who have been identified as having contributed to the resource management, scientific and/or commercial process.” (IV.D.48)

Should the state be authorized to identify those who contributed to resource management? In cultures where knowledge is collective, shared and cumulative and the notion of invention is foreign, how will the contributors be rightly identified?

Indian citizens, companies are allowed free access to biological resources within the country for commercial purposes but are barred from transferring findings to foreign entities without the NBA's approval; the provisions succeed in burying biodiversity under bureaucracy.

PVPFR Extant Varieties includes a variety available in India, which is notified in the Seeds Act 1966 or a farmer's variety or a variety about which there is common knowledge or any other variety which is in the public domain.

Bio-resources and Bio-piracy

Shalini Bhutani

Ms. Bhutani's power point presentation is given in annexure 9.

I think there is more that I've taken in the past day in the backbench, than I'll probably give in the front bench here. But as my friend who is here with me may vouch for, it is no longer unusual for a set of lawyers to come in when genetic resources are being discussed in a room full of scientists particularly in this time and age of interface between law and science. It is a challenging time for the lawyers as well as all of us battling with legal issues vis-à-vis plant genetic resources.

So my task is not made any easier with the complexity of legal issues that have already been highlighted in the past two days. But what today's presentations have done is to add another layer of legal issues. There is a set of laws which you all discussed. There are regulatory systems on ethno-veterinary services in India and statutory institutions dealing with livestock management. Then we also have a whole body of laws pertaining to conservation and natural resources. And now particularly in the last decade we have this new module of laws, which has been increasingly impinging on the rights to resources. And this is the interface that I am talking about: the interface between IPR legislations and how they regulate plants and animal resources, and particularly the knowledge of these.

The common thread in the discussions which we have had since yesterday and today on IPR is that we have to confront privatization. We are more familiar with how natural resources that is land, water and forests get systematically privatized in the name of economic reforms in the agenda of GLP (globalization, liberalization privatization). Intellectual property rights in fact are a manifestation of privatization of knowledge itself. How does this whole IPR debate then link up with livestock? What are the dimensions of the IPR debate?

One is the whole issue, like I said, of the patenting of life forms, whether it is for plants or animals. There are different kinds of intellectual property rights on plants and plant material, which may be effected either through patents, plant variety protection laws or through any other form of IPR. These IPR regimes apply to inventions, such as products of genetic engineering, products of the new science of biotechnology, which are often products that livestock persons have to deal with. For instance, the use

of transgenic cotton is not only an issue for a farmer, but the Bt-Cotton seed oil which then gets used as cattle feed becomes an equally important issue for a pastoralist. Apart from that, you have a whole range of new ethical and legal issues connected to livestock, with “new” animals being “invented” and subsequently sought to be owned through IPR!

Now what I will do is cull out from the past three presentations some of the issues that are before us—from Prof. Gadgil’s endorsement of the patent system and its articulation in the new bio-diversity legislation, to Dr. Bijoy’s whole critique of government’s mechanisms to control people’s knowledge systems, to what possibly may come out from Mr. Vishwas’s idea of the commons—now should we work to that, is that the way out? I am happy to have as a woman the last word, in a panel full of men! Please bear with me if I repeat some points which were stated earlier.

While we have the whole range of law and policy on plant genetic resources, I’d like you to situate the new legislation, that is the biodiversity legislation, not in isolation but in the context of other legislations. Increasingly, the entire gamut of law and policy is talking more and more the language of IPR.

Let’s just look at what the principles of the international law on plant genetic resources has to say and how they play themselves out in context of the domestic legislation which has been passed. And while it is argued that there are desirable objectives of the CBD signed by the world community in 1992, it is important to see whether those principles have actually stood the test of time and whether in the supposed implementation at the domestic levels those principles are still incorporated.

I was told in law school that there are 3 C’s that a good lawyer keeps in mind. One is you first try to convince the judges. If you can’t convince then confuse them. If you can’t confuse, then all you have to do is corrupt them!

Have those principles in CBD been corrupted by the international trade agenda is what we need to see. The Indian government claims that these principles are being upheld and being put into motion through the Biological Diversity Act 2002. I will examine three key principles of the CBD, and how they have been translated into rights. One is the sovereign right of resources of states. I mean sovereign rights not of a government to claim ownership of their natural resources, but the rights of states, rights of governments to hold these in trust for the communities that were actually the de facto managers of the bio resources.

Then is the issue of prior informed consent and consultations with the community towards that end. Does the community have the right to say ‘no’? Consent means yes,

consultation need not mean yes. The procedures for prior informed consent need to be spelled out. Apart from the consent rules and the procedural details, the question is whether the whole bilateral decision actually facilitates decision making by those who ought to exercise their community sovereignty.

When the CBD was first negotiated, the whole idea was that we need internationally recognized and accepted rules and regulations that will determine the terms and conditions when knowledge and genetic resources cross borders. When they do cross borders, what are the different elements of benefit and what forms of benefits are actually shared by the country of origin? Is there really a niche market there for our knowledge and our resources, or is there a myth in benefit sharing?

Since the last 10 years of the implementation of CBD there have been more than one instance of developed countries benefiting disproportionately from benefit-sharing arrangements as compared to bio-rich countries. One of the earliest instances was that of Costa Rica which in 1991 was in the limelight in terms of the first bio-prospecting, benefit-sharing legal agreement. Whether that actually did translate into benefits or are we just chasing a mirage? Do our resources really carry with them that kind of value and will that money really compensate for a loss of access to communities? I think this is the filter we need to see through.

The two other international institutions that are concerned with plant genetic resources are the FAO (through the International Treaty on Plant Genetic Resources) and the CGIAR (Consultative Group on International Agriculture Research) system, where various collections of genetic material collected from farmers are being held in trust by 16 centers of excellence which fall under the mandate of the CGIAR system across the globe. And both these were meant to be IPR free.

Intellectual Property Rights policy is influenced not so much by scientists, governments and people, but the private sector. While it was hoped that our governments would crack bio-pirates, today they are cracking bio-deals.

India is a part of a 15-member group of like-minded mega-diverse countries. Why does this group come together? Not because they all are equally concerned about conservation, but if they operate together, they will not be competing with each other, for bio-deals with bio-prospectors and the life science organizations of the West. So you have this group essentially put together by Brazil, Mexico, India, Philippines and Indonesia which negotiate collectively on issues of IPR. The group of mega-diverse countries expects the international regimes to address benefit sharing and to take the form of a new legally binding instrument.

Let us look at how IPR today is used as a means of economic regulation, as a means of scientific control, and most importantly how IPR systems determine rights over biological resources.

There are different kinds of IPRs: patents, geographical indications, trademarks, copyrights, industrial designs, layout-designs of integrated circuits, protection of undisclosed information. The international institutions dealing with patents include WTO with the TRIPS agreement, the WIPO which is taking forward the global patent agenda through various international patent treaties. Under WIPO we also have the Intergovernmental Committee on Genetic Resources, Traditional Knowledge and Folklore. Then there is the Union for the Protection of Plant Varieties (UPOV) Act of 1978 and the Act of 1991.

A patent is an exclusive right granted by government to a person or business to exploit an “invention” for a certain period of time. Under the WTO, patents are available for any inventions, whether products or processes, in all fields of technology, provided that: they are new, involve an inventive step and are capable of industrial application.

The exceptions are that members may choose to exclude plants, animals and essential biological processes for the production of plants/animals from patenting. But for the protection of plant varieties members shall provide patents or an effective sui generis system or a combination of both.

However, patents cannot protect traditional knowledge for various reasons: Firstly, it is impossible to identify an individual inventor. Traditional knowledge cannot be attributed to a particular geographical location. Exclusive ownership of plants is alien to many social and cultural beliefs. The required criteria of “novelty” and “inventive step” are not always possible. The costs of applying for a patent and pursuing infringement cases are prohibitive. For instance, who invented basmati rice? Is the knowledge of neem known only to one community? Does ayurveda belong to one vaid? Are the qualities of turmeric uncommon knowledge in Indian households? Do our cultural beliefs propagate that humans created plants?

It is important to note that TRIPS contains no safeguards against the grant of patents on unlawfully acquired genetic resources or traditional knowledge. In June 2003, India submitted to the TRIPS council that patent applications on biological material or traditional knowledge must disclose the source and country of origin, give proof of prior informed consent and show evidence of fair and equitable benefit sharing.

It is very clear that the position of the Government of India is that it accepts patenting and other IPRs on life forms, makes patenting of TK merely subject to CBD

and incorporates TK into TRIPS, reducing TK to a trade issue, a commodity and an IPR.

In February 2004 some countries like Bolivia, Brazil, Cuba, Ecuador, India, Peru, Thailand and Venezuela once again made a submission stating that while applying for patents, there needs to be disclosure of source and country of origin of the biological resource and of the traditional knowledge used in the invention. There also needs to be disclosure of evidence of prior informed consent under the relevant national regime and disclosure of evidence of benefit sharing under the relevant national regime.

There is a lot of international pressure on India to amend its patent laws and other laws so that they conform to the broader international agenda on patents. For instance, the USA put India on its Patent Watch List, over inadequate protection of IPR. India's amended patent law became effective in May 2003. But the US has termed it inadequate, saying it exempts from patent protection subjects like biotechnological inventions, processes for the treatment of humans, animals and plants. Then there is continued bilateral pressure on developing countries through the recent TRIPS-plus phenomenon. TRIPS-plus provisions may call for countries to implement UPOV standards, accede to the UPOV, accede to the Budapest Treaty on the Deposit of Micro organisms for the purpose of Patent Protection, recognize patents on plant varieties and/or biotechnological inventions and commit to "highest international standards" of IPR protection on life forms.

Thus, coming to India's Biological Diversity Act: This Act is to have effect in addition to, not in derogation of, any other forest and wildlife legislations. The Act has been legislated to give effect to the country's treaty obligations under the Convention on Biological Diversity. The biggest weakness of the Act is that the Act does not say no to IPRs. With regard to IPR, the law should ideally read: No Intellectual Property Rights are permitted on biological material, its components or derivatives, accessed from India and the knowledge associated with it.

Anyone wanting to take a patent or other intellectual property right (IPR) for any "invention" based on any research or information on a biological resource, must seek approval of the National Biodiversity Authority (NBA). The NBA may consult an expert committee set up for the purpose and grant approval subject to certain terms and conditions, including imposition of royalties. The Act provides for the levying of appropriate fees and royalties on such IPRs. However, one must note that NBA clearance is not required for an IPR application under the PVP law. The National Biodiversity Authority may, on behalf of the Central Government, take any measures necessary to

oppose the grant of intellectual property rights in any country outside India on any biological resource obtained from India or knowledge associated with such biological resource which is derived from India. However, in practice, if bio-piracy cases such as the proposed patents on turmeric, neem and basmati were to occur post this legislation, what exactly would the NBA do?

In practice the realities of benefit sharing are there for us to see from the experience of countries like Costa Rica, and subsequent to that, the strong stand that country took against patents in their national bio-diversity law.

The infamous INBio-Merck contract of 1991 promised the Costa Ricans

- Up-front money for conservation
- Eventual royalties to the country
- Economic revenue
- New and cheap medicines and products available
- Tropical forests undisturbed
- Technology transfer

However these remained unfulfilled. Instead, what happened is that

- Bio-prospecting has failed as a conservation tool
- Advance payments did not prevent deforestation
- There have been no pharmaceutical hits, so no royalties
- Techniques are not always non-invasive
- Limited and second-rate technology transfer
- Rights have been abdicated to third parties

In conclusion, the way forward is by campaigning against IPRs, asserting sovereignty and reviving local food and health cultures, promoting traditional practices, encouraging seed saving and facilitating a new civil disobedience against IPRs.

Questions and discussion

- *Dr. Nitya Ghotge to Prof. Gadgil:* If you talk about various local groups in the village which would be responsible for protecting the rights of the community and their biodiversity, we already have a confused, complicated history of, for example, panchayats, gram sabhas, and all kinds of village bodies. We also have a history of the powerful in the village gaining more power through such committees. In that context, how do you ensure that the village biodiversity body is going to be any different from the existing village bodies, and it really would have the interests of the people or community at heart today? Because so far I don't think we have any great historical evidence of the same?
- *Prof. Gadgil:* There's no guarantee. But I don't think that democracy is not working in India altogether or that the decentralized instruments of democracy are totally defunct. So hopefully the biodiversity committees would also make some progress and over time they become a little more effective than they were earlier. Certainly the existing village bodies are becoming a little more effective here and there. Sometimes there is progress and regression.
- *Dr. Nitya Ghotge:* Is there any special mechanism to ensure this in these biodiversity committees?
- *Prof. Gadgil:* The only special mechanism is that these bodies have statutory sanction unlike, say, the Vana Samraksha Samitis, which hopefully will make it possible for them to function a little more effectively. Many other committees are ad hoc, and this is not ad hoc in that sense.
- *Ms. Bhutani to Prof. Gadgil:* You've talked about statutory technicalities but how will this be read in conjunction with constitutionally established bodies such as the gram sabha? How far do they acknowledge the gram sabha? You just now mentioned the legislation, however the Biodiversity Act does not mention about the gram sabha at all.
- *Prof. Gadgil:* The legislation is supposed to act in parallel with other existing laws, so certainly as per the Panchayat Raj Acts, these samitis will have to act along with the gram sabha. But you are right in that the Act does not specifically mention the gram sabha.
- *Question:* Cannot these ad hoc bodies be given a statutory status?
- *Prof. Gadgil:* We don't need a large number of different statutory committees. Natural resource management at the grassroots level should be done in an integrated fashion.

So perhaps these biodiversity management committees should properly take on the jobs which are currently being handled by different committees. In fact, it is extremely important that natural resource management be carried out in an integrated fashion in the village under the responsibility of one statutory body, rather than numerous committees and bodies being responsible.

- *Mr. Bijoy:* A few indicators are there. Like, for example, if you recollect what Imrana said. She made a beautiful analysis of the primary health care programme where she mentioned that rather than a horizontal integration, verticalization took place that is related to certain services and certain programmes. Now what is happening in the legal frame is also verticalization of systems. For every subject matter, there is a set of laws, there are certain authorities and there are so many parallel authorities working against each other and in collusion with one another. Now if you look at the problems of patent laws, there is a fundamental assumption that the state shall be obliged to follow the Indian Constitution and that is flawed. If you look at the Panchayat Raj Extension to Schedule Areas Act, in Andhra, elections were declared, voting took place, groups had to go to the high court to say that the election is unconstitutional and therefore the results were stayed. In the state of Maharashtra, elections were notified. Somebody had to go to the court and get the order saying this notification is unconstitutional. The Ministry of Environment, recently in February 2004 issued a notification saying that there will be regularization of lands encroached by adivasis and others who have been living and cultivating land in forest areas up to 1993. The Supreme Court stayed it because it is illegal. So you are now faced with a situation where people are upholding the law and the state is the violator of law. This is one problem. The Panchayat Raj Extension to Schedule Areas Act to some extent, and in some ways, this act clearly says the village shall have the command over resources. Now does that contradict with the Biodiversity Act? So you have a situation where laws contradict each other. Forget about implementation and whether it is implemented properly or not. The whole aspect is the legality of the law in relation to the Constitution; in itself it is quite questionable. The point is what do you do about it. Now many of the people including lawyers should be able to say. However, lawyers are afraid to go to the Court because through judgements, the Constitution would be subverted. This is the position of patriotic, sensitive, law-abiding lawyers!
- *Dr. D. K. Kulkarni:* Now, all over India we are facing the problem of displacement of persons due to irrigation dams and other things. The environmental impact

assessment is not carried out at all in these places, and there is a major loss of traditional knowledge, folklore and related resources. Do the IPR provisions protect this or not?

- *Ms. Bhutani:* There is a provision in the biodiversity legislation, called EIA.
- *Dr. D. K. Kulkarni:* Look at what happened in the Western Ghats: there are 150 dams and due to these dams, so many people were displaced from their original homes to places where there are no resources at all. Their traditional knowledge has also been destroyed. My question is whether the inter-governmental committee on genetic resources and traditional knowledge is powerful enough to stop displacement, because this will prevent the loss of communities' knowledge and resources?
- *Ms. Bhutani:* There are two aspects to your question. One is the EIA procedure already existing, i.e. the rules and regulations existing within Indian law which is essentially the EIA procedure notification in 1994, brought out under the Environment Protection Act. Under this, all development projects have to be scrutinized and given environment clearance. Maybe biodiversity aspects could be integrated into those procedures, particularly in the public hearings.

Second, internationally there is growing concern and empirical evidence on the question of whether IPRs have actually caused a disadvantage or loss of access to knowledge by local communities.

- *Dr. Ramdas:* I've got two questions: One is to Prof. Gadgil and one is to all of you and any one of you could respond. Prof. Gadgil, I'm again drawing from Anthra's experience of our research where we find that so many practices or the use of so many medicinal plants and the knowledge related to these are not exclusively the ownership of one individual nor the community in one area. In fact, even after completion of our official research period, we find that through the course of our work, there are so many communities who have the same knowledge, the same applications, the same biodiversity, so in this whole framework which you presented, in the whole link up to NIF and the whole regime of managing the biodiversity knowledge, which community is really going to be given the patent right or be awarded as the "creator and innovator of this knowledge"? Which community is going to be acknowledged? Further, when you talked about confidentiality and restricting certain knowledge, what one community/individual may think is confidential knowledge maybe put out in the public domain by another community.

The whole nature of traditional knowledge is such that it is based on so many years of experience, innovations of so many thousands of people, that I feel this entire reality does not fit into the frameworks proposed to manage the information etc.

My second question is that over the years now, we've been hearing that creation of biodiversity registers would provide a way for communities to challenge patents which are potentially applied for, and would be accepted as a valid document in a court of law. To what extent is this really true?

- *Prof. Gadgil:* Yes, in benefit sharing, confidentiality will not work. I have no doubts about it. But everybody seems interested. The law talks about it and the National Innovation Foundation is dealing with it, so I have been discussing with them about how possibly to handle it and I agree that it is not possible to handle it in this fashion at all. What one can do is two things. Firstly, of course, coming to your second question, even if it is confidential information but it is formally documented in some fashion, then as prior art, perhaps it has some value, preventing somebody else from patenting this knowledge.

What I am interested in and I think is reasonably valid, is that in terms of management of all these resources, and where there is no question of any information which people might wish to keep confidential. There is lot of good understanding of how to manage the resources which people can be quite willing to share and all of these institutions and this law could give and creates space for people to become more involved in the management of these resources and its related knowledge, which should be shared with everybody. This should be documented and widely disseminated and put to use. As far as the other component, the IPR-related component where there is all this debate, I personally have no illusions that IPR can actually benefit people. There is also this local biodiversity fund. So maybe you can create some incentives. If some people are recording knowledge well, then you can give some lands to those panchayats or those groups who recorded some very useful knowledge. Additionally, there should be special awards for those who record this full knowledge and are willing to share this knowledge with everybody. So maybe that kind of benefit is possible. I can visualize that. And perhaps that is what one should be thinking about.

- *Mr. Bijoy:* Your question is how this documentation helps in this whole patent and IPR issue, right? The documented indigenous knowledge only becomes relevant when you actually plan to go to court to challenge a patent application on that particular knowledge. Since you are not planning to patent this knowledge, then

what is the relevance of documenting this traditional knowledge? What purpose will it serve?

- *Ms. Bhutani:* Let's not undermine community-initiated processes of documentation, where the process is more important, the sharing and interaction, rather than one mandatory documentation.
- *Mr. Vishwas:* I would like to respond to that; play the devil's advocate here. If I know that there's a particular leaf or a particular plant and its particular character and I go and patent it in U.S., my patent is for the pure form of that particular ingredient in that plant. How do you counter it? You can't. I mean, your registers, your knowledge, whatever you've done, you can't counter the patent with this kind of documented knowledge. Technically, it won't stand.
- *Mr. Jacob:* I'm working on conservation of crop genetic resources in Madhya Pradesh and in Chattisgarh. And I've been following this whole discussion on TRIPS right from 1993, the plant variety law, the biodiversity law and to my understanding what's happening is a paradigm change of creation of intellectual property rights and protection been given by the state to it. The CBD compliant law, the biodiversity law is supposed to facilitate conservation and sustainable use. But it is doing the opposite. It is facilitating the opposite of what is needed for conservation and sustainable use. And in a similar fashion the plant variety law. It's just creation of an intellectual property regime and protection of it. It doesn't think of protecting the indigenous crop genetic resources of the country for future generation of farmers and indigenous people. It only creates plant breeder rights. It is essentially a plant breeder rights law, which is a TRIPS compliant law. It does not create any space for farmers or communities to protect their resources and knowledge. These crop genetic resources have developed in a context where there was open sharing of knowledge within the community. If it is somebody's individual intellectual process, it doesn't develop further and unless this space for sharing remains within communities, between communities, these resources are going to be lost and now that you have created plant breeder rights, you are facilitating alienation of these resources from the public to the private domain, and the state is going to protect it. So what the CBD has achieved is essentially the so-called sovereign rights principle for the state but the state's sovereignty is already being taken away, to legislate in the interest of the people. So this is what is happening. What is happening is intellectual property rights regime is being enforced and states are falling in line and people do not have any space. The media, the intellectual and scientific community and the government

have reinforced the necessity of IPR regimes as the only means of protecting peoples rights to their knowledge systems. The IPR regime only furthers the plundering of the commons, and this is being facilitated by laws such as the biodiversity and plant variety protection law. This reality has to be taken to the people.

- *Ms. Bhutani:* I agree with you. But just saying no, is not enough. That does not absolve us of our responsibilities. Think of the alternative vision that you are proposing. I will come to this. What are you going to do?
- *Dr. J. K. Malik to the lawyers on the panel:* We in our laboratory, since the past 15 years have been working on plant-based medicines and about 15 years back there was a publication according to which about 4% of Deodar oil is very efficacious in the treatment of mange. The research was published. When Dabur entered into animal health care, the first product with which they came out with, for veterinarians, was the 4% Deodar oil in gel, and during the first two years, I think, they had a turnover of more than two crores, only on this product. So my question is that as the Anthra team has come up with documentation of very simple, cost-effective, efficacious traditional remedies, is it possible that we can protect in one or the other way the connoisseur exploitation of their findings from the multinationals that are also entering now into the herbal drug medicines. Is there any way out that whatever traditional remedies Anthra has come out with, which they have worked for last nine years, they should not be picked by the multinationals and national pharmaceuticals? Because these remedies are so much cheaper and they are so effective the multinationals can make any amount of money.

Ms. Bhutani: The existing laws do not provide any mechanisms for preventing the appropriation of such research by commercial enterprises.

- *Dr. Malik:* The reason I ask about how to prevent such treatments from being appropriated is that I am a member of various committees, relating to the export, import and manufacture of pharmaceuticals, where we periodically propose regulations on various aspects of their trade and use. Can we propose a mechanism to prevent misappropriation of such traditional treatments, which I could recommend and put up to these various committees.
- *Ms. Bhutani:* By January 2005, patent laws in India are going to be completely TRIPS compliant, which is going to allow for product and process patents. That is the eligibility for patenting. But at the practical level, the biodiversity legislation doesn't stop local use or local bio-use or there's an exception provision which talks about,

if it's for non-commercial use, then local vets, local practitioners can continue to use that, as a way they had done so far.

- *Dr. Ramdas:* But basically the situation is that if any company would like to take up any knowledge or any kind of information and commercialize it, there's nothing we can do.
- *Ms. Bhutani:* If it's a domestic company, then they would need to get a stay by the Biodiversity Board. If it's a foreign international, then you will have to approach the National Biodiversity Authority.

Emerging issues

The issues which emerged were clearly diverse. They ranged from endorsing IPR regimes, CBD and India's Biological diversity Act and within these trying to find spaces for protecting people's rights, to an outright rejection of these laws as being discriminatory. For most of the audience from the veterinary profession it was the first time that they were exposed to such diverse views and naturally there were many questions. The debate does not end here but in fact just begins, and scientists, academicians, practitioners and development workers will have to examine these issues carefully for themselves keeping certain critical points in mind.

Medicine Making

A total of 133 participants registered for the medicine making session. Each participant was given a set consisting of gloves, mask, and cap. Participants including healers, NGO representatives, animal health workers, veterinary doctors, veterinary students and interested individuals. Dr. Jayvir Anjaria, Dr. Sadekar and Dr. Sanjay Dakore taught the participants how medicines were to be prepared besides the team from Anthra.

Healers meeting

Before the actual process of making medicines, a meeting was held to share experiences of traditional healers who had come from Andhra Pradesh, Karnataka, Maharashtra, Chattisgarh and Tamil Nadu. After a brief introduction by all the participants, an interaction was initiated with the healers. They were asked to express the major problems faced by them in the course of using herbal medicines. Some of these are summarized below.

Problems faced by healers

Non-availability of medicinal plants was the major concern expressed by most of the healers from all four states. The reasons cited for this shortage were:

- Restrictions placed by the forest department on entering the forest and collecting plants
- Failure of rains leading to reduction in growth of plants
- Clearing of village forests leading to unavailability of plants near the village
- Commercial exploitation of medicinal plants by several agencies thereby rendering the plants rare
- Monoculture plantations by the forest department resulting in scarcity of medicinal plants
- Implementation of social forestry and Joint Forest Management schemes leading to many problems for people dependant on the forests for their medicinal plants.

Responding to the above problems, Dr. J. K. Malik from IVRI suggested writing an official letter from the workshop participants to the Ministry of Environment and Forests raising this problem of healers being restricted from collecting medicinal plants from the forest. The letter could also request free access to medicinal plants for healers who serve the communities needs through their knowledge.

Following this the participants were requested to list their expectations from the medicine making session.

Expectations from the medicine-making workshop

Ms. Anjamma from A.P. expressed the hope that this workshop would focus on and discuss ways to promote medicinal plants.

Veterinary students expressed the concern that this subject is not a part of their curriculum and with Anthra's help this could be included in their course. They expressed a desire to learn more ethno-veterinary treatments and also indicated that they would like to do some research on it.

Mr. Shantaram of Lokparyay, Aurangabad, said that documentation of the whole process of changes taking place in the land use is very important; the land available for medicinal plants has reduced leading to their scarcity. He wanted to bring this issue to the notice of the government.

Mr. Mahadev representing Green Foundation, Bangalore, felt that as healers from different states and with different experiences were present at this session, it was a good platform to share and exchange their experiences.

One participant observed that goats eat a lot of plants and their milk contains lots of medicinal value. If the plants mostly eaten by goats are observed, efforts can be made to conserve/preserve these plants.

Another participant observed that some plants contain toxic principles and one should be careful about using these plants.

Mr. Digamber from A.P. said that on behalf of this workshop we should send a request to the Forest Department not to clear forests and to include medicinal plants in future plantations.

After this Dr. Anjaria spoke briefly about medicine preparation. He also made some pertinent points listed below:

- The workshop has been organized to teach people how to prepare and store medicines, which we are not able to obtain fresh throughout the year
- Those medicinal plants which cannot be obtained easily may be grown in the area surrounding houses and in fields
- More than one plant can be mixed in a treatment to make it more effective and provide a synergistic combination
- Many diseases which occur in humans also occur in animals; hence the same medicines could be used for both with a change in the dosage, i.e. if 1 spoon is given to humans, 8 spoons can be administered for calves and small ruminants and 16 spoons for large ruminants.
- While treating with herbal medicines the stage of disease is very important.

Collection and identification of medicine plants

As the participants came from many states of the country and spoke many languages, The participants were divided into three groups on the basis of language spoken and understood (Group A: Marathi; Group B: Telugu and Kannada; and Group C: Hindi and English).

The groups were shown over 65 medicinal plants which had been brought from the Anthra nursery. Healers from other states had also brought some exhibits and these were displayed. Mr. Sanyasi Rao, Mr. Marne, Mr. Vivek Broome and Mr. Pramod Pokharker guided the participants through the exhibits explaining the features of various plants and their uses. Following this, a presentation on guidelines for collecting and harvesting medicinal plants (annexure xx) was shown to the participants. During these sessions there was a rich exchange of information amongst the healers from different states on the uses and identification of medicinal plants as well as guidelines for their sustainable harvest.

Healers from all groups made the following points regarding collection of medicinal plants:

- Collection of medicinal plants is a very spiritual act. Healers usually collect these plants on a new moon day either on a Sunday or Thursday and that too only after a bath.
- Plants are collected only during Uttara Nakshatra.
- Some plants are collected only during eclipses.
- While gathering the plants, the collector should face the sun. The collector should never have his/her back to the sun.
- Plants which are available only in the rainy season and are used frequently, are collected and stored for the whole year.
- Mainly it is the leaves, bark, flowers and fruits that are collected. Only in the case of a few plants do they collect the roots because collection of roots destroys the plant.
- With regard to the tulsi (*Ocimum sanctum*) plant, the middle part of the plant is more effective but usually the entire plant is used, said a healer from Karnataka.
- While extracting the latex of Ficus species, healers believe the extractor's shadow should not fall on the plant.
- Medicinal plants should be picked when they are flowering and fruiting. The plant and its parts should be neither too young nor too old.
- Maturity of plants is decided on the basis of colour of bark, smell of leaves, stage of flowering and fruiting.
- It is better to store the medicinal plant parts, after they have been dried, in gunny bags rather than in plastic bags so that they will get some air and not be attacked by fungus.
- The entire bark from the trunk should not be removed at one go. The bark should be removed in patches.
- Healers store medicinal plants in their houses believing that the smell of the plants keeps snakes away from the house
- Cow urine (*gomutra*) is never stored in a brass vessel; it is strained through seven layers of muslin cloth before being consumed.

Some Interesting plants and their uses as shared by the healers

Shatavari (*Asparagus racemosus*)

Local names

- Konkan – shatawari, aswal
- Marathwada – divasmavali
- Aurangabad – dudhmuli, sasanychi muli
- Gadchiroli – marbat

Use – galactogogue

Vavding (*Embelia ribes*)

Local name

- Raigadh – ambat bindkali

Uses – for diabetes and typhoid; as a dewormer

Bibba (*Semecarpus officinale*)

Local names

- Konkan – bibuwa
- Gadchiroli – bhallatak

Uses – for vata (disease condition in animals), piles, abscess, migraine

Bibba oil: vata

Khair (*Acacia catechu*)

Use – stomatitis, blood purification, skin diseases, tooth powder

Leaves are used as fodder for animals

Makoti, Makadshingi (*Caralluma adscendens*)

Local name

- Aurangabad – Shindalmakad

Use – As an appetizer, for scabies

Umbar (*Ficus racemosa*)

Use – the pulp of the plant for fracture

Jambhul (*Syzigium cumini*)

Uses – for diabetes, vomiting

Lajalu (*Mimosa pudica*)

Use – uterine prolapse (juice of leaves)

Brahmi (*Bacopa monnieri*)

Used as hair oil

Medicine making

Preparation of medicines for humans and livestock were done with different resource persons. First, the theory of each medicine was explained and then the preparation was practically demonstrated. Twenty medicines were prepared in all. Not all these medicines were folk medicines. Some were ayurvedic recipes which had been used by Dr. Anjaria for many years. Some were folk treatments validated by Anthra and now widely used in their work. Yet others were recipes shared by Dr. Sadekar and Dr. Dakore who have many years of experience and have used these in their practice.

List of medicines

<i>Powders</i>	<i>Used in</i>
Rakta medak churna	humans
Rasayan churna	humans
Rasayan +p	humans
Flea powder	animals
Bloat powder	animals
Powder for fevers	animals
Diarrhoea powder	animals
Galactagogue	animals

Liver tonic	animals
Dewormer	animals
Heart tonic	humans
Immuno modulator	animals
Wound	animals
<i>Ointments</i>	
Sintumalam	humans
Pain balm	humans and animals
Shwet malam	humans
Neem ointment	humans and animals
Mastitis ointment	animals
<i>Liniments</i>	
Camphor	humans and animals
Turpentine	animals
<i>Oils</i>	
Carron	humans and animals
Neem oil	human and animals

Over 70 people attended this session, which included veterinary students, healers, and animal health workers. This session was greatly appreciated by the healers who cheerfully took back bottles of the medicines prepared. This marked the end of the workshop.









Contributors

Vinod Ahuja is currently Professor and Head of the Centre for Management in Agriculture, Indian Institute of Management, Ahmedabad. He has been researching on issues in the field of agriculture economics and more recently has been part of various studies looking at reforms within livestock health care delivery systems. He is also coordinating FAO's Pro-Poor Livestock Policy Initiative Hub in South Asia, where they are working with different state governments to help the latter bring in policy changes which will be pro-poor.

Jayvir Anjaria is an eminent veterinary pharmacologist and has the rare distinction of also being well trained in Ayurveda. He is best known for his several books on medicinal plants and animal treatment such as *Ethno-veterinary Heritage and Animal Friend*. He is a fountain head of knowledge and has been one of the key advisors of Anthra's Technical Advisory Committee since 1997.

V. R. Bhamburkar is a veterinarian by training with a specialization in veterinary surgery. He is presently Dean of the Nagpur Veterinary College.

Shalini Bhutani is a lawyer by training, and after starting out with practising in the Supreme Court of India, she moved on to work in the development sector. She is currently working with a small international think tank group called GRAIN (www.grain.org). From her desk in Delhi she deals with issues of trade and rights vis-a-vis plant genetic resources.

C. R. Bijoy has worked in the area herbal medicine and health care. He is now involved with issues relating to rights over resources.

Vishwas Deviah is a lawyer with the Alternate Law Forum, Bangalore. He has a Masters in International Economic law. The Alternate Law Forum is involved with legal counseling, alternative dispute settlement, and IPR issues

B. N. Dhawan retired as the Director of the Central Drug Research Institute, Lucknow.

Madhav Gadgil, an eminent ecologist, was until recently Professor at the Centre for Ecological Science, Indian Institute of Science, Bangalore. A botanist by training, he has made fundamental contributions in the disciplines of mathematical ecology, conservation biology and human ecology.

D. Rama Kumar is a veterinarian and has taught at the Punjab and Haryana Agricultural Universities as well as in Tripoli in Libya. He was Secretary of the Veterinary Council of India from 1991 to 2001. He was Member Secretary of the working group constituted by ICAR to review curriculum of veterinary colleges as well as the Member of the core group constituted by the Veterinary Council of India (VCI) to develop draft curriculum for all veterinary colleges in India as part of the VCI (Minimum Standards of veterinary education) regulation.

J. K. Malik is an eminent veterinary pharmacologist and is currently Professor at the Division of Pharmacology and Toxicology, Indian Veterinary Research Institute, the premiere veterinary research institute in the country. He has occupied key research and teaching positions within the country and abroad. For many years he has also been on the Technical Advisory Committee of Anthra, guiding and steering the research protocol.

Philomena is trained as a herbalist and has been with the organization AIKYA for the past 22 years. Since 1987 she has been involved with the Shodhini project.

Imrana Qadeer, Professor at the Centre for Social Medicine and Community Health, Jawaharlal Nehru University, New Delhi is a medical doctor with a specialization in pediatrics. Her areas of research are in the field of primary health care, epidemiological studies and analysis of health policies.

D. Swaroop is presently Principal Scientist and Head, Division of Medicine, IVRI. He has been Professor at the RG College of Veterinary Science, Pondicherry. He has many publications and papers to his credit. He has also been the Editor of the *Indian Journal of Veterinary Medicine*.

***NATIONAL WORKSHOP ON INDIGENOUS KNOWLEDGE
APPLICATIONS FOR LIVE STOCK CARE***

14-17 SEPTEMBER 2004

PUNE

Programme

Day 1

Forenoon Session

IKAH Project

ANTHRA Team: Sharing of project findings

Afternoon Session

Need for validation and validation methods

Panel : 20 mins. 2:30 – 4:30 presentations

- Dr. Jayvir Anjaria, Retd Professor of Pharmacology , Gujarat Agricultural University
- Dr. Dhawan, Member of ICMR Advance Center SAC at NIN
- Dr. J . K Malik, Professor of Pharmacology, IVRI, Bareilly
- Ms Philomena, AIKYA Bangalore
- Dr. Chandana Chowdhary, Associate Professor Pharmacology, College of Veterinary Science Assam Agricultural University

Evening

7:00 p.m Book release function – (ETHNOVETERINARY RESEARCH IN INDIA: AN ANNOTATED BIBLIOGRAPHY by Sagari Ramdas and Nitya Ghotge)

Followed by dinner

Day 2**Forenoon Session****Discussion on privatization of health care systems /knowledge**

Panel : 45 mins each 10:30 – 1:30

- Dr Imrana Qadeer, Professor, Centre of Social Medicine and Community Health, Jawaharlal Nehru University, New Delhi
- Vinod Ahuja, Faculty, Centre For Management in Agriculture, IIM Ahmedabad
- Prof. Rama kumar, Retd Secretary Veterinary Council of India.

Afternoon Session**Discussion on introducing ethnoveterinary course in college curriculum and for LSS courses**

Panel : 20 mins each 2:30 – 5:30

- Dr. Bhamburkar, Dean Nagpur Veterinary College
- Dr. D. Swaroop, Prof & Head medicine Dept . IVRI
- Prof. Rama kumar, Retd Secretary Veterinary Council of India

Evening Session**Presentation of Technical papers**

Panel: 20 mins each 6:00 p.m onwards

- Dr. Kala Kumar Bharani, Dept of Veterinary Pharmacology, Veterinary College, NG Ranga Agriculture University.
- Dr.G.S.Parida, Department of Medicine, Faculty of Veterinary Science and Animal Husbandry, O.U.A.T., Bhubaneshwar.
- Dr. Chandana Choudhary Barua, Associate Professor, Dept. of Pharmacology and Toxicology, CVSC. AAU.Khanapara, Assam.
- Dr. F.A.Ahmed, Arunachal Pradesh.
- Dr. Raneesh Santhanakrishnan, FRLHT, Bangalore.
- Dr.C.R. Jangde, Dr. M.S.Dhakate; Nagpur Veterinary College. MAFSU, Nagpur, India

Day 3

Forenoon Session

Discussion on Biopatents & Biopiracy

Panel 30 mins each :10 00 –1: 30

- Prof. Madhav Gadgil: Professor, Centre for Ecological Sciences, Indian Institute of Science
- Mr. C.R. Bijoy, Independent Researcher / Member, All India Coordinating Forum for the Adivasi/Indigenous Peoples
- Dr. Vishwas Deviah, Alternate Law Forum, Bangalore
- Ms. Shalini Bhutani, Grain, India

Closing

Medicine Making (Optional)

Day 3

Afternoon Session

Practical exposure to Medicinal plants and their Identification

Dr . Anjaria, the Anthra team and Network of Animal Health Workers and Healers

Day 4

Forenoon and Afternoon Sessions

Medicine making

Dr. Anjaria, the Anthra team and Network of Animal Health Workers and Healers

Anthra is a resource centre offering training, research and advocacy initiatives in the areas of livestock, biodiversity and peoples livelihood.

This document presents the proceedings of the workshop entitled Indigenous Knowledge Applications for Livestock Care held in Pune, India from 14 - 17 September, 2004. The purpose of the workshop was to share the research findings of Anthra's project on Indigenous Knowledge and Animal Health with a larger group of veterinarians, scientists, academics, development workers and professionals. An equally important objective was to explore concerns and initiate debate on issues of intellectual property rights (IPRs), biodiversity and benefit sharing in the larger context of rapid privatization of health care services and knowledge systems.

The logo for Anthra, featuring the word "anthra" in a stylized, lowercase, handwritten-style font. A small asterisk-like symbol is positioned above the letter 'a'.

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