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TRADITIONAL KNOWLEDGE: A HOLDER'S PRACTICAL PERSPECTIVE

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Dear Friends, representatives of different cultures and communities, Ladies and Gentlemen,

I have come all the way from one of the remote villages of western India to talk about the innovations I have made in the field of agriculture. And that in a drought prone arid region of Rajasthan receiving on an average less than 400 mm rain fall every year.

I have developed a novel variety of chili called the Danta selection based on selection from traditional agro-biodiversity of chili in our region. Our region is famous for red chilies as are many other dry regions around the world. The Danta chili has three times the colour value of any other chili variety in India. The product, I am proud to say, has been the result of a long and rigorous experimentation that I have pursued on my own without any external aid or support.

The hybrid chili seeds produced in the market are exorbitantly priced, say about 1300\$ per kg. I have been able to select certain other chilies from local, traditional varieties which have an equal or often greater yield. My chili variety is not so highly priced. But if it is performing at par with the hybrids produced by a multi national company incorporated in India, should it not have a similar price and identity? How will it get that identity and protection? India does not have as yet a law for the protection of farmers' varieties but I learn from SRISTI that, in India, we are going to have such a law very soon.

My produce was highly appreciated and attracted the attention of many people when it was exhibited at the Golden Jubilee celebrations of the State Agricultural University, Jobner, Rajasthan.

Background:

With this brief introductory note let me now introduce myself. My name is Sundaram Varma. I come from a farmer's family. I belong to a village called Danta in Rajasthan. I am a science graduate. I am solely dependent on agriculture for my livelihood. The region gets hardly an average of 400 mm rainfall per annum. There are large variations in temperature (ranging from- 1 degree to 48 degree celsius) and rain (300 mm to 600mm). There is an acute water shortage. It has therefore been a challenging experience for me to earn my livelihood. I own 2 hectares of irrigated land and 3 hectares of unirrigated land. I sow crops as per a long term crop cycle. The crops that I grow on the irrigated land are onions, chilies, wheat, mustard chick pea, bean, sesame, etc. I use the unirrigated land for experimental tree plantation and growing rain fed crops. I grow the local tree species like Ardushi, Shisham, eucalyptus etc. Certain crops likes bajra , moong, and sesame are grown on one hectare of rainfed land. The remaining portion is utilized for agroforestry by growing both cash crops and other trees in the same field.

Thanks to SRISTI, I was given a chance to not only let others know about my research achievements but also have support for pursuing further research in a more systematic manner, have international exposure and get recognition at state, national and international level. My research achievements have been in the development of varieties in several crops, development of organic farming systems, indigenous agro-forestry methods of growing trees in deserts with only one liter of water, and conservation of agro-biodiversity.

From Tradition to Contemporary Innovation

I have been a practicing farmer for over 25 years. While I have always been in touch with the latest scientific methodologies, I have not been overawed by this knowledge. I have broken out of this formal knowledge base and developed my own innovations whenever the situation of my family and village so warranted. I have also been associated with scientific departments and agricultural universities. I have always tried to form a bridge between traditional knowledge and modern scientific technology. It was this, which attracted me to experiment on crop varieties. I have worked on the traditional forms of knowledge available and SRISTI has provided me a platform to articulate my creativity and innovative efforts in using traditional knowledge as well as developing new technologies.

Developing a new chili variety:

For example, let me tell you about the chili variety which I have developed.

I selected a chili plant as a result of selective breeding which was pest resistant, cold resistant, high yielding and less pungent than prevalent chili varieties. Some of these turn out to be three times superior in terms of pigmentation (that is colour value).

Comparative analysis of the two varieties of chilies: The Danta selection is compared to the existing two varieties of chili, namely RS1.

Danta chili

Features	Danta variety (Sundaram Verma's)	RS1 variety (Rajasthan Select)
Sowing Time	Late Sowing; April	Sowing usually in February-March
Pest attack	Less	More
Pests and diseases Resistance	More	Less
Cold resistance	More	Less
Flowering	All at a time (in flushes) But 5-6 times	Not at a time 10-12 times
Time between pickings	More	Less
Production	200-225 quintals/hectare	150-170 quintals /hectare
Colour value	Three times more color value than RS 1	Average color value
Dry weight	More	Less
Market value	Two times more than the usual	

My experiments in dry farming and agroforestry

This is another area of my experimentation and innovation. I had learnt the basic techniques of dry farming in the young farmers' learning course at the Indian Agricultural Research Institute (IARI) in 1982. The water needed for irrigation was very scarce. The only persisting problem was to stop evaporation and water loss by capillary action. If something could be done then the moisture content of the soil could be retained.

My experiments on agro-forestry

Description	General procedure	Sundaram's method
Sowing season for tree seedlings	Before monsoon	After monsoon
Preparatory procedures for saving	Pits are dug	Pits are not required
Irrigation	Each plant requires 15 litres of water at least 4 times.	A single plant requires only one litre once and no extra watering required.
Cost	Proves to be more expensive	Proves to be less expensive
Type of trees	Most of the times only thorny shrubs survive	Any kind of trees can be planted (fuel wood, fodder or other wood yielding varieties)
Survival rate of the planted saplings	Fifty to sixty five per cent	Eighty to ninety per cent

My experimenting and the innovative capacity to do something extraordinary motivated me to become actively involved with SRISTI.

Through my work with the Society, I realized the value of my own creativity beyond the local context which I had seen before. Not only me, there are many other colleagues and friends of mine who have derived benefits and attained recognition for their innovations through SRISTI's untiring efforts in expanding policy and practical space for grassroots innovators.

Let me recall an interesting incident.

I came into contact with SRISTI during December 1995 in one of the workshops organised by Prof Anil K Gupta in Jaipur. The workshop was attended by agricultural scientists, officials, farmers and teachers who had done something different and new. The workshop proved to be a great experience for me. It connect me to many of my kind, since I realized that there were many others like me trying things out in their own unique way. In the past, they had all been unconnected with each other, with policy makers, or with organizations such as SRISTI and the Honey Bee Network.

Dr. Arun Sharma, a scientist working at CAZRI read my profile in the Honey Bee Newsletter on dry land agro-forestry. He invited me for a discussion on the technique at Jodhpur. It was here that I was introduced to another innovative farmer, Mr. Narayandas Prajapati. He was a farmer who knew the importance of Sona Mukhi.

I was awarded the Jagjivan Ram Award (National award for outstanding farming in 1998). The criteria for the award was based on growing seven crops in three years which was the ideal crop rotation process. For example the crops grown range from cereals, vegetables, spices, pulses, legumes, oilseeds etc. So the focus was on how some of the the traditional crops were grown in an efficient and sustainable manner, the crop protection measures and, on my experimental dryland forestry and agro-forestry.

From obscurity to public recognition and support

In spite of the innovations I made and the positive results I obtained, I hardly got any recognition or appreciation for it. Most regretfully, my innovations did not diffuse as much as these should have (despite the fact these were more efficient and profitable). This may be because modern institutions do not realize the potential of farmer-driven research on conservation and creative utilization of *in situ* agro-biodiversity. The rewards or recognition I achieved became possible through the intervention of SRISTI, which provided me a platform to project my innovations in the field of agriculture. Not only me, there are thousands of other colleagues who have been recognized for their innovations through the platform provided by SRISTI.

I will in the end raise issues about why of intellectual property policies do not exist to protect the use of traditional knowledge and resources in creative manner, reward innovations and help me discover global markets for my products, new seeds and help me and my community.

At this point I would like to elaborate a little about SRISTI as an organization and my involvement with it for the last four years.

SRISTI (*Society for Research and Initiatives for Sustainable Technologies and Institutions*) is a non-governmental organization, which aims to strengthen the capacity of grassroots innovators engaged in conserving biodiversity and developing sustainable technical solutions to local problems. Our major objectives are:

- i. To document, analyze and disseminate technological as well as institutional innovations developed by the people themselves.
- ii. To create a greater space in society for building upon initiatives and innovations at grassroots with special focus on women's indigenous knowledge.
- iii. To validate and add value to local innovations through experiments (on farm and on-station) and laboratory research for generating nature-friendly sustainable technologies.
- iv. To conserve local biodiversity through *in situ* as well as *ex situ* measures.
- v. To protect intellectual property rights of grassroots innovators like me and to generate incentives for recognizing, respecting and rewarding grassroots creativity and associated ethical values and norms.
- vi. To provide venture support to grassroots innovators to scale up products and services based on grassroots innovations through commercial or non commercial channels with the help of the Gujarat Grassroots Innovation Augmentation Network (GIAN) in Gujarat and through SRISTI in other parts of the country.
- vii. To incorporate the insights learnt from grassroots innovations into the formal educational system in order to expand the conceptual and cognitive space available to these innovations.

Let me mention briefly the activities that we have carried out at SRISTI to achieve these objectives:

1. Documentation and Dissemination :

The decade old Honey Bee network had started this activity right from the beginning.

The documentation of people's knowledge have been pursued on the basis of following principles, without fail :

1. Whatever is learnt from people must be shared with them in their own language.
2. All practices/innovations must be identified by the names and addresses of the individuals in order to enable the exercise of possible IPRs by grassroots innovators.
3. If any income or gain accrues to us, the outsiders, through publication, or value addition or diffusion of this knowledge, a reasonable share of the same will be provided to the innovators, groups thereof, or their institutions.

Just like a Honey bee collects pollen or nectar from flowers and they do not complain, people whose knowledge is collected should not complain. Similarly, we should connect people to people through local language communications so that horizontal networking, lateral learning and empowerment takes place in society.

SRISTI has been documenting and disseminating grassroots innovations through the Honey Bee Newsletter, including six other regional language versions. We have evolved several approaches for documentation and validation of innovations. We have surveyed about 4500 villages and documented more than 8300 innovations related to agriculture, livestock health and management, farm implements and machinery, poultry keeping, leather tanning, herbal medicine, soil and water conservation, vegetable dyes etc., from within Gujarat and about two thousand innovations and outstanding examples of traditional knowledge from other parts of the country and the rest of the world. Three quarters of these have been documented from within Gujarat. These innovations are systematically maintained in a computerized textual, multimedia and multi-language database in English as well as Gujarati.

I will not go in to the details of the methods that we have followed so far but would like to mention some of the novel approaches and methods which I personally liked the most.

1.1: Shodh Yatra:

SRISTI has organised three *Shodh Yatras* (journey of exploration by walk) in Saurashtra, north and southern Gujarat in 1998-1999 with the objective of participatory learning and dissemination of experimental and innovative ethics among communities. The first journey of about 250 km was undertaken on foot on May 15 and the second one 150 km on December 31, 1998. SRISTI also honoured the most knowledgeable men, women and children in almost every village during the journey.

This has given us a unique opportunity to interact and understand in a better way the local poor and the neglected innovative individuals and communities who have not been reached and heard so far by any government or other institutions.

1.2 Shodh-Sankal: Farmer-initiated chain of innovators

This is a network of individuals who experiment and do things differently but have one thing in common. Constant curiosity and zeal for innovation. Many of them end up solving their problems in a very creative and innovative manner. But these innovations remain localized and sometimes unknown to other farmers in the same village. This lack of diffusion

cannot be considered a reflection on the validity of the innovations. The innovations could be of technological, socio-cultural, institutional and educational value. They have the potential to contribute to the conservation of local resources, the generation of additional income, or the reduction or prevention of possible losses.

2.0: Value addition : Philosophy and efforts

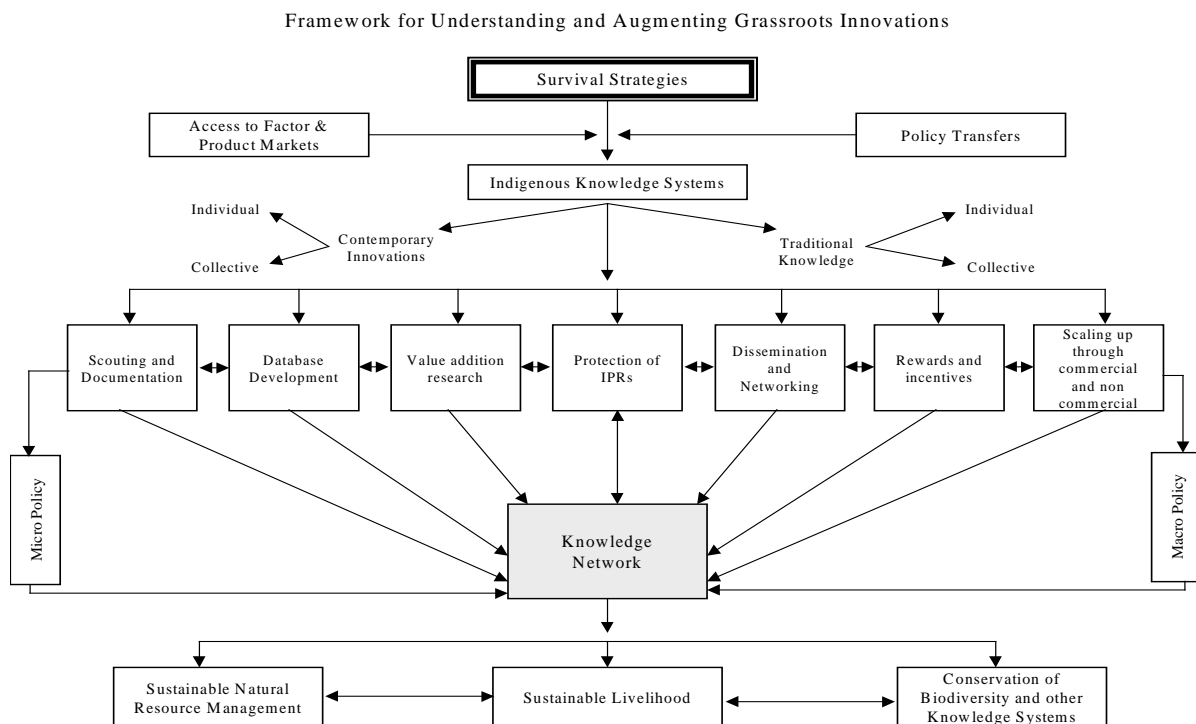
We at SRISTI believe that value addition to indigenous knowledge will help local communities by not only providing an opportunity to live closer to nature which they have been doing for centuries, but also by reducing primary extraction of natural resources and generating long-term benefits. SRISTI actively supports the Honey Bee Network which attempts to identify, recognize and reward innovative individuals/groups who have developed sustainable solutions for natural resource management.

SRISTI itself has set up an internal fund from the income received from licensing of three veterinary health products based on public domain traditional knowledge and our own funds to honour ten to fifteen innovators every year in our annual network meetings.

Similarly, we have filed patent applications on behalf of some innovators. In the case of a tilting bullock cart developed by Mr. Amrutbhai of the Pikhore village, while the patent is pending, the technology has been licensed to private entrepreneurs from three districts of Gujarat for an attractive financial consideration.

Honey Bee, in that sense, is like a Knowledge Centre/Network which pools the solutions developed by people across the world in different sectors and links not only people, but also the formal and informal science.

(Knowledge network Flow chart)



Conserving Agricultural Biodiversity

SRISTI has extended administrative support to IDRC, Canada for monitoring the **USING Diversity Awards** - a small grant of approximately Rs 3 lacs, each given to individuals and institutions for conservation of agricultural biodiversity in South Asia.

This research award provided support to my research ideas and enabled me to continue with experiments, successfully proving that locally developed varieties can be superior to the commercially released high-yielding varieties.

Salient features of my results are presented here

S.No.	Name of crop	Name of crop varieties	Unique characteristics as compared to varieties developed by agricultural scientists
1.	Garlic	12	Higher productivity in one variety
2.	Onion	10	6 varieties with higher productivity
3.	Cluster bean	22	3 varieties with higher productivity
4.	Sesame	5	1 variety highly productive and resistant to red rot disease
5.	Green Gram	4	1 variety performing better if sown out of season
6.	Cabbage	3	1 variety is suitable for sowing I Ageti, Madhyam and Pichhchoti
7.	Fenugreek	16	2 varieties highly productive and 3 varieties resistant to Chachia disease
8.	Chick pea/ Bengal gram	20	4 varieties resistant to Root Rot disease.
9.	Millet	36	2 varieties drought resistant, 1 variety highly productive
10.	Coriander	31	11 varieties highly productive
11.	Cumin	41	2 varieties Jhulsa disease resistant
12.	Chili	48	2 varieties high yielding & 1 variety with higher colour value as compared to Rallis hybrid seed company
	Total	250	

Under the Using Diversity award program the different chili varieties were exhibited at the Golden Jubilee celebrations of the Agriculture University, Jobner, Rajasthan, India. The Governor of Rajasthan, along with a large number of scientists, farmers, teachers, and students of schools and colleges (a total audience of 10,000 people) were among the audience of the exhibit.

Many people used to visit my farm because they knew about the attributes of my varieties. Some times they would take away a few samples in exchange of mere appreciation and leave. Nobody cared to think about our welfare and rights. I would like to mention that it is beyond our custom to refuse seeds to anybody. In this way we fail to retain our exclusive rights on the seeds which we alone have developed. We are at a loss to ask for the rights even if we come to know that the same variety of seeds are being sold by a commercial farm under a specific brand name.

In this regard I would pose the following queries to the audience:

- Do we not have the right to safeguard our innovations and inventions? If we do, what is the mechanism for IPR Protection?
- Can we not provide some mechanism of protection for the small innovators like herbalists, healers or traditional knowledge holders?
- Is there no way in which the revenue earned by the products based on our knowledge can be utilised for furthering our research?
- Is it not fair that we farmers who sweat and toil to produce novel varieties and conserve traditional varieties should get rewards for our investments in innovation and conservation?
- How long do you think should we be dependent on institutions like SRISTI and other funding agencies, which provide the required support?

I am here to present and plead for a low cost registration system which would help material-resource-poor farmers like me worldwide (I may be poor materially but not in knowledge and my capacity to innovate). Patents are filed by huge multinationals, why cannot we have a body representing us to do the same for us? Why can't there be a collective management system of intellectual property rights for us small farmers?

I have attended the workshop sponsored by SRISTI on the occasion of the WIPO Fact-finding Mission on Traditional Knowledge, Innovations and Culture to South Asia on October 3, 1998 at the Indian Institute of Management in Ahmedabad. We discussed issues such as erosion of traditional knowledge, contemporary innovations that need IPR protection, appropriate mechanisms for ensuring them, the role of NGOs and scientists in the development and value addition of innovations.

Policy Advocacy for the Protection of Intellectual Property Rights of Innovators

Let me describe the policy advocated by SRISTI. A proposal to set up INSTAR (International Network for Sustainable Technology Applications and Registrations)- a global system of registrations for inventions and innovations to help secure IPR protection for small innovators. It would be tailor-made for those who cannot afford the costly IPR system as it exists at present. The high costs of hiring patent attorneys makes the present patent system out of reach for grassroot innovators.

The absence of any institutional set up in most developing countries to

- (a) provide information about IPRs,
- (b) extend help to obtain patents for individuals or communities, and
- (c) oppose the patents by others on the knowledge traditionally known to local communities, have further alienated the moderates.

It should also be noted that secrecy is not a gift of the modern patent regime. Lots of traditional knowledge has already been lost or is in the process of being lost because the expert concerned did not ever share the innovation with any one. Every patent office in a western country should insist that patent applicant declares that the knowledge and resources used in a patent have been obtained lawfully and rightfully.

A global registry system will prevent any individual or legal entity from seeking patents on community knowledge as well as on knowledge and innovations produced by individuals without a form of cross licensing.

It will be possible to achieve the following results from such a registry system:

- Acknowledge individual and collective creativity
- Grant entitlement to the grassroots innovators for benefit sharing
- Increase the opportunities for small scale innovators by linking them with large scale investors
- Linkages may also be developed among similar communities facing similar situations across the globe.

A Knowledge Network for sustainable technological solutions enables innovations in one part of the world, to attract or seek investments from another part, and possibly, to generate enterprises in a third place. These enterprises could be commercial or non-commercial, individual or cooperative. Several innovative experiments have been started to explore this Golden Triangle for rewarding Creativity. It acknowledges that not all innovators may have the resources to become entrepreneurs or have access to investible capital. One could have an innovation say from India, an investor from Europe and an enterprise in South Africa. The forces of globalisation could after all be mobilised in defense of poor creative people. The Honeybee Network approach operationalizes this principle.

GOLDEN TRIANGLE (FIG)

The golden triangle linking innovation, investment and enterprise was initially pursued by SRISTI through its venture promotion fund. Later Gujarat Grassroots Innovation Augmentation Network (GIAN) was set up in 1997 as a follow-up of the International Conference on Creativity and Innovation at Grassroots, held at IIMA in collaboration with Gujarat Government to scale up and commercialize grassroots innovations. Even after that, SRISTI continues to provide financial support for action research to small innovators.

Some of my recommendations

I would like to propose a few points to be considered as possible measures towards protection of IPRs of the small inventors. There are several ways in which indigenous knowledge, innovation and practices can be protected so that informal knowledge systems continue to grow symbiotically linked with modern science and technology:

- a. Reforming IPR systems to make them accessible for small grassroots innovators.
- b. Establishing dedicated green venture promotion funds and incubators for converting innovations into enterprises.
- c. Establishing research and development funds to validate and add value to the innovations and to subcontract research studies to other R & D institutions.
- d. Building up a Knowledge Network and institutions (like SRISTI) which will act as a support to the innovators.
- e. Organizing regional and global exhibitions to give recognition to small scale innovators.
- f. Reforming the mandate and responsibility of the institutions of the Consultative Group on International Agricultural Research (CGIAR) to make it obligatory for

international agricultural institutions to accord priority to adding value to local innovations.

- g. Rethinking and redefining the role and responsibility of international financial institutions with respect to ethical, institutional and financial support for grassroots innovations and local knowledge systems.

I would like to thank both WIPO and SRISTI for providing this opportunity.

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