

To,
THE CHAIRMAN
D M KHATAU TRUST,
6, Shoorji Vallabhdas Marg,
Bombay - 1.

31st Oct.1998.

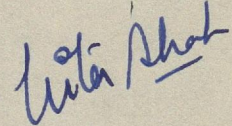
Sub: Proposal - "Survey of Indigenous crops in Kutch and parts of
Banaskantha District in Gujarat".

Dear Mr.Chairman,

As per our discussion on 14th October 1998, am enclosing the
proposal titled "Survey of Indigenous crops in Kutch and parts of
Banaskantha District in Gujarat" *for your perusal.*

Thanking in anticipation,

Yours sincerely



(Dr. Nita Shah)

Mailing Address :

C/O Mr. Qamar Qureshi, Scientist,
Wildlife Institute of India,
P.B.#18 Chandrabani, Dehra Dun - 248001.
Tel#: 0135 - 640112 to 640115
Fax #: 135 - 640117
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PROJECT PROPOSAL

1. PROJECT TITLE : Survey of Indigenous crops in Kutch and parts of Banaskantha Districts in Gujarat.
2. NAME OF SCIENTIST : Dr. Nita Shah
MAILING ADDRESS : C/O Mr. Qamar Qureshi
Scientist, Wildlife Institute of India, P.B.#18, Chandrabani, Dehra Dun - 248001.
Tel#: 0135-640112 to 115
Fax : 0135-640117
email: qnq@wii.gov.in
3. NAME OF ADVISOR : Shri S.C.Debroy (IFS)
4. DURATION OF PROJECT : Four and half months
5. TOTAL AMOUNT REQUIRED : Rupees Two lakhs & fifty two thousand (Rs.2,52,000/-)
6. DOCUMENTS ENCLOSED : Project Proposal
Proposed Budget

SIGNATURE OF THE SCIENTIST

Nita Shah

DATE:31st October,1998.

PLACE:DEHRA DUN

SURVEY OF INDIGENOUS CROP DIVERSITY IN KUTCH AND PARTS OF BANASKANTHA DISTRICTS IN GUJARAT

INTRODUCTION

There is a worldwide concern over the loss of the diversity of plant genetic resources. A particular worry is the substitution of a diverse set of genetically variable crop landraces by a few genetically uniform modern varieties (Bellon 1998; Brush, 1991; Harlan 1992). The need to conserve this diversity has been recognized as important for many decades. It has translated into the creation of gene banks around the world, i.e., *ex situ* conservation (Hawkes 1983; Plucknett et al., 1987). Lately, on-farm conservation has been advocated as a complementary method to *ex situ* conservation (Bellon 1997; International Plant Genetic Resource Institute 1993; Brush 1991; Altieri & Merrick 1987).

On-farm conservation of plant genetic resources can be defined as the continued cultivation and management of a diverse set of crop populations by farmers in the agroecosystems where a crop has evolved. This set may include the weedy and wild relatives of the crop that may be present together with it, and in many instances tolerated. It is dynamic and is aimed at maintaining the evolutionary processes that continue to shape this diversity. It is based on the recognition that, historically, farmers have developed and nurtured crop genetic diversity and that this process still continues among many farmers in spite of socioeconomic and technological changes. It emphasizes the role of farmers for two reasons: (1) crops are not only the result of natural factors, such as mutation and natural selection, but also and particularly, of human selection and management; and (2) in the last instance, farmers' decisions define whether these populations are maintained or disappear (Bellon 1997).

The Asia-Pacific region is the most thickly populated part of the world. This region is unique in that agriculture has been systematically practised for the past 6500 years. Over the millennia a variety of native (indigenous) and introduced species have co-evolved with the different kinds and intensities of agriculture and have become an integral part of this man-modified ecosystem (Daniels 1995). A knowledge of the occurrence and functioning of indigenous crop diversity in these man-made landscapes is absolutely essential for any programme on sustainable agriculture and development. With the advent of advanced biotechnological facilities measuring biodiversity at levels lower than that of species viz. organismal and genetic is being pursued (Daniels 1995).

The genetic variation within the species can be of major importance in identifying priorities for the conservation of crop plants and their wild relatives. These same measures can be useful in trying to judge which species have sufficiently wide vocabulary of genetic selection and evolve if the environmental changes rather than become extinct (Harper & Hawksworth 1994, Paroda 1990). The genetic potential is represented in the diversity of races and other types occurring in the traditional cultivation and their wild counterparts.

The development of new varieties and its loss is a continuous process to meet current needs. The replacement process which was slow and gradual left enough scope for diversification of crops. As farmers adopt modern varieties and agricultural practices, they generally get shifted to monoculture, which has led to genetic simplification of many farmlands. The remaining genetic resources therefore need efficient management for their conservation and utilization.

India is one of the 12 megacentres of domesticated plant diversity, and centre of origin (Zeven & Zhukovsky 1975). There are nearly 2400 plant species of economic importance accounted for in the 12 megacentres of diversity. Of these 160 species belong to the Indian centres of diversity, besides 320 wild relatives (Arora and Nayar 1984, Zeven and de Wet 1982)

The suitable area for cultivation during the period 10,000 to 4000 years BP were relatively drier tracts along water courses in the Indus plains and the Deccan peninsula (Gadgil & Guha 1992, Dhavalikar 1988, Allchin & Allchin 1968). The earliest evidence of settlements of cultivators or pastoralists were reported from Mohenjo-daro, Harappa and other sites of Indus valley civilization (Allchin, 1969). The reported plant remains from the great alluvial tracts of the Indus system are club wheat (*Triticum compactum*) and Indian dwarf wheat (*T. sphaerococcum*), barley *Hordeum vulgare* and *H. vulgare* var *nudum*, Pea (*Pisum arvense*), sesamum and mustard (*Brassica juncea*), Cotton (*Gossypium* sps.) and European madder (*Rubia tinctorum*) and *Zizyphus* sps. (Allchin 1969).

AGRICULTURE IN GUJARAT

The Gujarat state has 53% area under food grain cultivation and 47% under cash crops. As per 1981 census 52% of Gujarat State working population depended on agriculture which contributed nearly half of the Gross National Product of the State's economy. The crops largely depend upon the monsoon as only about 14% of the area is provided with irrigation (Gujarat State Gazetteer 1989). Gujarat has recorded an increase in crop production due to the increased use of chemical fertilizers and the extension of areas under high yielding varieties.

In Kutch the cultivated area is less than 25% in comparison to other districts. The major crops grown in the State are bajri, wheat, paddy, jowar, maize and pulses among the food crops and cotton, ground nut and tobacco among cash crops. There are other crops like isabgul, cumin, fennel which are grown in specific areas (Gujarat State Gazetteer 1989).

Marcia Frost (1998) had reported five indigenous crops from Kheda i.e. *Banti, Bavto, Chino, Kang and Kodra*. These crops were grown along with the other food crops as they, had high protein content, could withstand inclement weather, were able to evade pests and worked as natural fertilizers too. Today these crops are unheard of mainly due to their low market values.

It is therefore imperative to conduct native crop inventory and explore the factors responsible for the decline in the indigenous crop diversity.

STUDY AREA

Initially the Kutch and part of Banaskantha Districts would be surveyed.

OBJECTIVES

1. Know the indigenous crops grown in the arid Kutch and part of Banaskantha.
2. Crop variety inventory

METHODS

a) Literature Review

b) Review of Agricultural Records of Talukas.

c) Field surveys

I shall use Participatory observations and questionnaires for the study. The two questionnaires of importance : 1) Crop Variety inventory 2) Landholding inventory will enable us to comprehend the level of diversity maintained by farmers, their variety selection criteria and the associations of particular varieties with particular environments.

d) Interview based surveys : Interviewe with farmers > 60 yrs.

WORK PLAN 1998

I Mid November to December last week

LITERATURE REVIEW

1. ICAR Delhi
2. Anand Agricultural University, Anand, Gujarat.
3. Krishi Bhavan Ahmedabad.
4. Gujarat State seeds corporation Ltd. Gandhinagar.
5. Vivekananda Research Institute Mandvi.
6. Fodder/Grass Institute, Harij.
7. Visit to Kutch district collectorate.
8. National Bureau of Plant Genetic Resources, Jodhpur.
9. Gujarat Agricultural University, Dantivada, Gujarat

II. January and February 1999

FIELD WORK

Survey nine talukas of Kutch and some areas of Banaskantha for the indigenous species:

III. March 1999

REPORT WRITING

REFERENCES

- Allchin, B and Allchin F.R. 1968. *the Birth of Indian Civilization*, Penguin Hammondsworth.
- Allchin F.R. 1969. *Early cultivated plants in India and Pakistan*, P.J.Ucko and G.W.Dimbleby (ed.). *The domestication and exploitation of plants and animals*. Gerald Duckworth & Co.Ltd.London.
- Altieri, M A & L.C.Merrick 1987. *In situ conservation of crop genetic resources through maintenance of traditional farming systems*. *Economic Botany* 41:86-96
- Arora, R. K and E.R.Nayar 1984. *Wild relatives of crop plants in India*. NBPGR Scientific Monograph #9.
- Bellon, M.R 1997. *On-farming conservation as a process; an analysis of its components*. L. Sperling and M.Loevinsohn (ed.) *Using Diversity: enhancing and maintaining genetic resources on farms*. IDRC, Canada.
- Brush S.B. 1991. *A Farmer based approach to conserving crop germ plasm*. *Economic Botany* 45:153-165.
- Daniels, R.J. Ranjit 1995. *Biodiversity indexing in Agriculture*. M.S.Swaminathan Research Foundation, Chennai, India.
- Dhavalikar, M.K. 1968. *The first farmer of the Deccan*. Deccan College, Pune.
- Frost Marcia 1998. *The lost crops of Gujarat*, Times of India Ahmedabad.
- Gadgil, M & R. Guha 1992. *The Fissured Land: An Ideological History of India*. Oxford Publications.
- Gujarat State Gazetteer 1989. *Guj. State Gazetteer Part 1*. Government of Gujarat.
- Harlan, J.R 1992. *Crops and Man* Madison, WI American Society of Agronomy.
- Harper, J.L & D.L. Hawksworth 1992. *Biodiversity: Measurement and estimation- Preface*. *Phil.Trans.R.Soc.London*.
- Hawkes, J.G 1983. *The Diversity of Crop plants*. Cambridge, MA Harvard University Press.
- International Plant Genetic Research Institute 1993. *Diversity for Development: the strategy of the IPGRI*, IPGRI, Rome.

Paroda, R.S. 1990. Management of Crop Genetic Resources - An Overview. R.P. Singh (Ed.) in Sustainable Agriculture: issues, perspectives and prospects in semi-arid tropics. Indian society of Agronomy, New Delhi. vol.2

Plucknett, D.L, N.H.J Smith, J.T Williams & N.M Anishetty 1987. Gene Banks and the World's Food. Princeton, N.J. Princeton Univ. Press.

Zeven, A.C. & de Wet 1982. Dictionary of cultivated plants and their regions of diversity. Pudoc Wageningen.

Zeven, A.C. & P.M Zhukovsky 1975. Dictionary of cultivated plants and their centres of diversity. Pudoc Wageningen.

PROPOSED BUDGET

SALARY

	DURATION (MONTHS)	AMOUNT (RUPEES)
Scientist @ Rs.24,000/month	4 1/2	1,08,000
One research assistant @ Rs.4,000/month	3	12,000
One local assistant (as and when needed) @ Rs.100/day	2	6,000

TRAVEL

Air/Rail/Road		20,000
Hiring a Jeep/Taxi (For field work) @ Rs.1000/day	2 1/2	75,000

ACCOMMODATION

(field & during literature survey)

15,000

MISCELLANEOUS

Stationary
Xeroxing
Telecommunication
Plastic bags
Photo films
Processing
First aid
Any other unforeseen
expenditure

11,000

REPORT WRITING

5,000

TOTAL

Rupees

2,52,000

(Rupees two lakhs and fifty two thousand only).