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Altitude extension: an imperative to transfer of technology in North-East hill ecosystem

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ABSTRACT

Extension education, by becoming a function for technology socialization, can't go without geographical references. With a change of altitude, the panorama of biology and sociology keeps transforming. What is happening since past and till today is a kind of blanket extension recommendations is being made to cover all geographical variations along and across the given hill ecosystem. In this paper and with this innovative approach, an empirical study has been conducted in the North East Hill Eco- system of India which is one of the hot spots of the World, for ultimately designing a both gross and subtle extension plan for desired changes in agriculture and social ecology of hill ecosystem. The altitude variances here are being associated with change in farming system, options of indigenous technology, culture, value and praxis, income and livelihood generation from a micro farming system. The altitude extension thus will add a new dimension of development instead of mere transfer of technology in North-East hill ecosystem.

Keywords: Altitude extension, micro-farming, praxis

The North Eastern region of India is a gift of nature having rich cultural and bio diversity related and diversified agro-climatic conditions. Agriculture and allied activities are the main sources of livelihood in the region. The region holds tremendous potential for the development of agriculture and related sectors particularly horticulture, post harvest and value addition. However, due to hilly terrain, erratic climatic conditions and shortage of trained manpower, the full potential of these resources is underutilized. Also, severe soil erosion, water scarcity during dry season, fragmented land holding and sloppy terrains are some of the major bottlenecks for mechanized farming. Altogether, the cropping system in the region is restricted due to topography. The structure, organization and function of these agro-ecosystem types differ significantly depending upon the social, cultural, economic and ecological settings (Ramakrishnan, 1992). All of these offer opportunities for redevelopment, with additional scientific inputs. The research work considers the possibilities**.** Some of the tribal areas show a high efficiency in production. As a matter of fact, the traditional societies in Manipur have a rich Traditional Ecological Knowledge (TEK) and Indigenous Technical Knowledge (ITK). Many traditional agricultural systems need to be redeveloped through incremental, rather than quantum change, based on traditional ecological knowledge; anything drastic may not find acceptance by the local communities (Ramakrishnan, 1992).

Today, many indigenous knowledge systems are at risk of becoming extinct because of rapidly changing natural environments and fast economic, political, and cultural changes on a global scale. (Rai, 2004) Practices vanish, as they become inappropriate for new challenges or because they adapt too slowly. However, many practices disappear only because of the intrusion of exotic technologies or development concepts that promise short-term gains or solutions to problems without being capable of sustaining them. The tragedy of the impending disappearance of indigenous knowledge is most obvious to those who have developed it and make a living through it. But the implication for others can be detrimental as well, when skills, technologies, problem solving strategies and expertise are lost. Planners and implementers need to decide which path to follow. Rational conclusions are based on determining whether indigenous knowledge would contribute to solve existing problems and achieving the intended objectives. In most cases, a careful amalgamation of indigenous and exotic knowledge would be most promising, leaving the choice, the rate and the degree of adoption and adaptation to the clients.

Agriculture is the principle occupation of the people. The production of rice has increased to a good extent; while this production has remained to the valley as well as to the rich farmers. It has not permeated to the weaker section of the society as well as to the farmers of the North-East hill regions. Rapid strides have been made in the agriculture sector over the years in Manipur and efforts have been made to introduce high yielding varieties.

The progress of Agriculture in valley is considered good. On the other hand, the development and progress of hill agriculture is still far below the level of expectation. The shifting cultivation locally

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known as '*Jhum*' cultivation is still widely practiced. Resource degradation, low productivity, tendency to encourage large family size and little or no scope for application of improved technology are some of the draw-backs in the *Jhum* system (Patiram, 2010). In order to have alternative farming system to replace *Jhum* and to introduce high yielding variety and viable technologies to increase the production as well as the improvement of farmers, the State and Indian Council of Agricultural Research have taken up steps through their research and extension activities.

However, in spite of the best effort, the technologies recommended were not adopted up to the expected level. There is a great need to discover as to why the new technologies have not taken root to the expected level. The farmers have to be convinced that adoption of new technology is beneficial to them otherwise they will continue to live below poverty line. This motivated to take up the present study to find out the various constraints related with altitude in adopting the new technologies by the farmer (in all the three altitudes high, medium and plain).

On the basis of the difference in the altitude and topography, land use pattern, land tenure system, non-availability of technologies, non use of improved implements, market facilities, difficulty in communication, inadequate extension support, non availability of trainings etc all differs. However in order to pinpoint the constraints in the transfer of technology the present study was taken up.Also, the unique features of changes of extension approaches are studied under an innovative framework of extension research, which is termed as "altitude extension". The present research is done to study the social and economic status of the farmers with accessibility of various sources and media of information and to ascertain the extent of adoption of recommended technology along with constraints in the transfer of technology. Also the possibilities of income generating enterprises as preferred by the farmers were investigated.

MATERIALS AND METHODS

The research work is based in a Ukhrul (3114 m above MSL), Tamenglong (1451 m above MSL) and Thoubal districts (790 m above MSL) of Manipur. One subdivision each has been selected from the three districts namely Ukhrul Central subdivision, Tamenglong subdivision and Kakching subdivision. From each subdivision two villages have been selected purposively for the districts' suitability with the research framework as Ukhrul district belongs to the highest altitude, Tamenglong district almost medium altitude and Thoubal being a plain land. 180 respondents' farmers were selected randomly. A questionnaire was prepared and pre testing was done by 'key informant focus group interview' and further improvement were made and relevant data were collected in various aspects of agriculture, technology transfer and technology gap. Additionally, the social, cultural and traditional lives of different ethnic groups in these places were studied during the year 2012. Data collections were done by developing village schedule and household schedule. Village schedule is collected by 'transact walk' and 'brain-storming method' to collect information regarding the village. Again household schedule is collected by visiting farmers field for relevant parameters such as: Age, Education Status, Occupational Status, Farm enterprise, Farm size, Annual income, Social Participation, Contact with extension agency, Mass media exposure, Scientific orientation, Attitude towards high yielding variety, Knowledge level, Preferred enterprises as source of income. All the parameters were measured by frequency percentage method and rank correlation.

RESULTS AND DISCUSSION

From table- 1, in all the three altitudes, majorities were middle aged, small holders and belong to medium income group. Educational status of the majority of the respondents was low to medium with high level of farming experience. The annual income both in the valley and the hill was all above national average. However, it might give a misleading impression that the people are rich but it was not so as the average size of the family was very big and this takes them to below poverty line. The result also indicated that contact with extension personal were poor in all the three altitudes, knowledge levels were low in both high and medium altitudes and medium in plain. The overall extent of adoption of the new technologies by the farmers in all the three altitudes was low. This indicates that the Government extension agencies have not been active in informing the farmers of the importance of transfer of technologies. No adoptive trials were found to be laid on the farmers' fields.

Table 1: Profile of farmers in different altitudes

Profile		Ukhrul (High)	Tamenglong (Medium)	Thoubal (Plain)
Age (%)**:**				
i)	less than 31	16	13	5
ii)	31-50	43	48	49
iii)	Old	41	39	46
Education (%)**:**				
i)	Illiterate	7	10	13
ii)	Elementary	43	40	28
iii)	High School	42	40	45
iv)	College	8	10	14
Occupation(%)**:**				
i)	Low	44	47	41
ii)	Medium	32	40	41
iii)	High	24	20	18
Farming experience (%)**:**				
i)	Up to 5 years	Nil	3	1
ii)	6-10 years	10	25	6
iii)	Above 10 years	90	72	93
Farm size (%)**:**				
i)	Small (up to 1 ha.)	43	50	70
ii)	Medium (1to 2 ha.)	41	40	15
iii)	Big(above 2 ha)	16	10	15
Contact with extension agency (%)**:**				
i)	Low(0-7)			
ii)	Medium(8-15)	65	70	84
iii)	High(8-15)	30	25	14
		5	5	2
Mass media exposure (%)**:**				
i)	Low(0-6)	79	69	58
ii)	Medium(7-13)	19	20	38
iii)	High(14-20)	2	2	4
Scientific orientation (%)**:**				
i)	Low	23	20	17
ii)	Medium	53	56	36
iii)	High	24	24	47
Attitude towards high yielding (%)**:**				
i)	Low	18	20	18
ii)	Medium	38	35	38
iii)	High	44	45	44
Adoption of recommended technology (%)**:**				
i)	Low	87	83	78
ii)	Medium	13	17	22
iii)	High	Nil	Nil	Nil

Table- 2 indicates that the inputs like improved seeds, fertilizers, insecticides, fungicides are not available at appropriate time and place. Unlike other States, fertilizer companies, seed companies are not coming forward to lay down demonstration experiments on the farmers' field. This hinders the transfer of technologies since the Government organizations neither have fund nor personnel to take up work on a large scale. It is investigated that farmers at every level have become conscious of the use of modern technology.

However, the unavailability of the technical information and agricultural inputs acts as a hurdle and therefore this needs to be tackled. In addition to this, a constant interaction between Scientists and extension workers with the farmers is a pre-requisite for accepting new ideas.

From table- 3, in case of enterprise, hill ecosystem farmers both in high and medium altitude prefer piggery, horticulture orchards, forestry while the plain farmers prefer rice, vegetables and fishery along with poultry. So, it can be concluded that the meager information on the benefits of the new technology has reached only to the rich farmers from the training programmes organized by the government agencies. However, if an overall impact has to be made we need to have more training programme for resource poor farmers. The local people demand led training programme needs periodical monitoring to transform the mere transfer of technology into the new concept of altitude extension in the North-East hill ecosystem.

Table 2: Problems and constrains

Problems	**Ukhrul (High)**		**Tamenglong (Medium)**		**Thoubal (Low or Plain)**	
	Score (%)	**Rank**	**Score (%)**	**Rank**	**Score (%)**	**Rank**
Market Facilities	46	I	35	I	4	VI
Supply of inputs like seed, fertilizer, pesticides	40	II	30	II	6	IV
Use of Improved Implements	7	III	14	III	5	V
Communication & Transport, road	2	IV	5	VI	10	III
Availability of technology	1	VI	6	V	45	I
Help from PDS	4	V	10	IV	30	II

Table 3: Preference ranking of income generating enterprises according to profitability and suitability

Enterprises	**Ukhrul (High)**	**Tamenglong (Medium)**	**Thoubal (Plain)**
i. Paddy	V	V	I
ii. Vegetable	IV	IV	II
iii. Fishery	VIII	VII	III
iv. Cattle	X	IX	IV
v. Poultry	VI	VI	V
vi. Piggery	I	II	VII
vii. Bee keeping	VII	VII	VIII
viii. Sericulture	IX	X	VI
ix. Horticulture	II	I	IX
x. Forestry	III	III	X

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