

Sustainable change through transfer of technology and produce marketing – A case study of the Dongriya Kondh of Orissa

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This paper shows how the approach followed by the government to provide appropriate agricultural technology and knowledge, as well as avenues for marketing of tribal produce through voluntary and government networks, has resulted in a substantial growth and change in the consumption habits of the Dongriya Kondh tribe of Orissa, enabling them to access modern amenities and improve their level of living.

THE DONGRIYA KONDHS, of Austro-Mongoloid origin, one of the oldest aborigines of the Orissa, are settled in deep pockets of the western *ghat* forests. The quality of life in this region is comparable to any poor African nation. These people are devoid of basic facilities of education, sanitation and health care. The population is largely dependent on the local resources i.e. forest and forest output for their survival. Forest output, including the *kendu* leaves and herbal fruits, are the major earning resources for them. Over a period of time, the Dongriya Kondhs have moved to shifting cultivation. In the shifting cultivation practice, they clear a piece of land in the forest and then use it for cultivation, and after few years of use, leave these land to shift to some other part of the forest. Many a times they put fire on a part of the forest for clearing which becomes uncontrollable, spoiling a large chunk of forest cover and causing havoc to the local bio-system. Shifting cultivation has resulted in mass destruction of the land cover in the region and large-scale migration to the plains of coastal Orissa.

The Dongriya Kondhs form numerically the largest group among the 62 tribes of Orissa, comprising 17.5 percent of the total Scheduled Tribe population of the State, and were once famous for their brutal acts of

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human sacrifice to achieve bumper crops and the killing of infants for better yield of turmeric. The Kondh household typically has very simple articles and equipment - gourd, wood, bamboo and stone articles, in addition to baskets, earthen pots and iron implements. The Kondh males wear a very small cloth. Women wear two cloths, one around the waist up to the knees and the other to cover the upper portion of the body. Dongriya Kondh women are very fond of ornaments. They beautify themselves with hairpins, ear rings, nose rings and head necklaces. The males use wrist necklaces and ear-rings. The Kondhs use both distilled and fermented liquor in their socio-religious functions. Liquor is considered as food for consumption, and, at the same time a ritualistic food to satisfy deities and spirits. Tobacco is used as narcotic. The leaves are dried up and powdered. This powder is eaten to rejuvenate one's energy levels.

The Dongriya Kondh, an ancient tribe settled in the Niyamagiri foothills of Koraput, a minerally rich district of Orissa, spread over a vast area of the forest, and dependent on forest sources and shifting cultivation, continued Swidden cultivation, along with hunting and food gathering for their survival till the 1950s. In the 1960s, the Dongriya Kondhs changed themselves from marginal farmers to horticulturists. This initiated the process of growth in the community.

Role of DKDA

The State government, in the 1960s, changed the earlier approach for tribal development from general equity delivery to the specific area approach.¹ In this context, the Dongriya Kondh Development Agency (DKDA) was established. The agency took a keen interest in not only delivering the modern amenities to the tribes but also equipping them to enter into a different level of living standard. The Kondhs got a better opportunity to develop their land by utilising fertilisers and insecticides. With improved irrigation prospects, they also started producing fruits and vegetables, including pineapple, orange, mango and papaya. They also cultivated cash crops like turmeric, mustard, ginger, black gram, arrowroot etc. More thrust was put on producing fruits like banana, pineapple, orange, and jackfruit. Livestock rearing too was practiced. The DKDA played two important roles in the growth and development of Dongriya Kondhs in this area. On one hand, it provided agricultural inputs in the form of pesticides, fertiliser,

¹ The general equity approach refers to national schemes applicable to all areas. The government also has special programmes for area development. Thus, in Orissa, there are special programmes for KBK districts, which are very backward.

and hybrid seeds, and on the other, it collected the agricultural produce and channeled it to the urban centers, which also helped protect the Konds from the clutches of exploitative businessman and informal money lenders.

The tribal produce marketing system

Over a period of time, a typical tribal produce marketing system had evolved. A strong informal financial money lending market had started operating among and around the community. This market had its conventional system of interest rates, debt facility, long term and short term lending practices and a typical repayment and loan recovery mechanism. This system was built so strongly over the period that it became impossible on the part of development agencies to break its shackles. The formal rural banking sector and government agency's loan delivery mechanism was largely dependent on mortgage of properties and possessions. The formalisation of tribal land holding to give the ownership to the tiller was not possible earlier due to the nomadic settlement behavior, shifting cultivation pattern, and negligence by government machinery. So the practice of loan by mortgage of property and possession failed. Consequently, informal moneylenders flourished in these areas. Poor level of education, and health conditions, non-regulatory life style, and drinking habits made their conditions worse.

The tribals procure loans for varied purposes. The loans can be categorised as being of two types, depending upon the frequency and the amount. The most frequently asked for loan is for their daily lives, which we can term as 'non productive loan'. These loans are mostly used for consumption purposes by the tribal, to meet the expenses of marriage and other social obligations. The second category of loans is for their living and agricultural input purchase. These are termed as 'productivity loans'.² These loans are big amounts and often, failure of a crop or draught makes them default and adds on a higher burden of interest on them. The nature and amount of loans from informal financial market differs from place to place and situation to situation. Loans for agricultural inputs, loans for functions and festivals and loans for daily contingencies varied in their size and frequency. Being illiterate, the tribes found it difficult to identify with the formal money lending system available to them via the government machinery and were largely exploited by the informal moneylenders. The

2 Productivity loans, by strict definition, are loans for agricultural inputs, but the common practice is also to help the beneficiaries earn a living by undertaking activities like trading, *bidi* making etc.

informal moneylenders took nothing in the form of mortgage except a promise of getting a part of their harvest. So the loans were available at a lesser effort for supplementing the Agricultural Input System as well as Agricultural Processing System. By the time the output is ready for marketing, the lenders have already paid a part of its price in the process of lending prior to harvesting. The intervention of government machinery and development organisations failed in procuring the tribal produce and marketing it.

The second aspect is the *nature* of the agricultural output. The output - vegetables and fruits, are perishable items. So the inadequacy in developing a marketing network and providing storage facility hampered the government organisations and cooperatives in making it a profitable exercise. On the other hand, the private moneylenders had developed such an intermediary and distribution network that they could increase the pace of the final produce's movement and make prompt payment on the site to the tribal farmer. In this way they could control the flow of the output and get back their money after suitable deductions with a higher interest rate compared to that of the government machinery. With the poor level of land holding, these marginal and tribal farmers were never an attractive market for mobilisation of either loans or deposits for the rural and cooperative banks. Consequently, taking advantage of this loophole, the informal moneylenders concentrated on them and marketed their produce, resulting in gross exploitation of the poor tribals of Orissa.

Issues of technology and growth

Of late, the participation of development agencies in the Agricultural Input Marketing System (AIMS) has been partially successful. The issues of transfer of appropriate technology have been addressed satisfactorily in bringing growth and development among the Dongriya Kondh Community. Knowledge regarding various basic technologies like tube-well, watershed management and biogas plants has been transferred to the tribals. The perennial water reservoir and its maintenance is no more a lookout of the DKDA. The local tribes in different villages are trained to repair the tube-wells also. The exercise on the biogas plant had been a total failure, due to frequent unavailability of spares and consumables and seasonality in the availability of raw material. Moreover, cattle dung, the major raw material, has a more productive use in the land than for a biogas plant for a tribal.³ So other agricultural inputs in the form of hybrid seeds or

3 Biogas too is an agricultural input. It is used to run small water pumps and also to support kitchen gardens

saplings, diammonium phosphate fertiliser and modern agricultural pesticides and preservatives are slowly being initiated to their process of agricultural production.

The marketing process for their output too has undergone a significant change, bringing an upward growth in their savings levels as well as psychographics. The output has increased substantially, and as a result, the local market (*haat or mandi*) is attracting a larger crowd and tribals are getting a better price for their produce. The only problem is in their loan management. Because of the past habit of frequent money lending from the informal money market, mostly for non- agricultural reasons, the moneylenders are still bargaining and giving a poor price for the agricultural output. The interest rates charged are quite high due to over dependence and failure to understand the calculations of moneylenders by the tribal farmers.

Research objectives

This research work was conducted in the Dongriya Kondh dominated area to find out the development and growth pattern of Dongriya Kondh and its reflection in the living pattern of the tribal. The study objectives included:

1. Assessment of factors influencing the buying behaviour of the modern amenities and products.
2. The criteria contributing to the selection of particular product range.

The variables taken to study the purchase behaviour of tribals were 1. Price, 2. Ease of maintenance, 3. Availability, 4. Economy range, 5. Comfort, 6. Aesthetic appeal, 7. Storing facility, 8. Fashion orientation and others. The assumption of purchase behaviour varying according to the demographic and psychographic descriptions of the consumers was also taken into consideration.

Sampling

A random sampling method was followed, taking into consideration the fact that sampling done otherwise is time consuming, tedious, costly and may even turn out to be erratic in our case. So we took up an estimation hypothesis and in statistical parlance took up a confidence level of 95% with a variance level of 0.05 ($Z \times \sigma + 0.5$). Assuming a normal distribution of the population we found that for a confidence level of 95%, the value of z to be 1.96:

Now we get Sigma = standard error of population

$$\text{Sigma} = 0.05 / 1.96 = .03$$

For a conservative estimate we take $P = .5$ & $Q = .5$.

So from this we get the sample size $n = 278$.

Data analysis

The data collected over the sample were analysed for our research purpose by using different statistical techniques, which include:

1. Kendall's Test
2. Factor Analysis

Kendall's Test

Kendall's test was conducted to test whether there is a significant influence of various factors in the buying decision of the tribal. We took up hypothesis testing with a null hypothesis and an alternative hypothesis to fulfill our objective (Table 1).

Null hypothesis (H): There is no significant influence.

Alternative Hypothesis (Ho): Differences exist.

Using Kendall's Test, we see that differences exist among the important factors which influenced their decisions.

Obtained values

Degree of freedom = 15, significance = 0.00

Chi- square (X_0) = 178.9819.

Table value of Chi- square (D.F = 15, significance = 0.00) = 26.045.

Accuracy: $W = .2022$

As $X_1 > X_0$: We reject the null hypothesis.

We observe that price and availability were two most important factors and fashion orientation and technically superior product were two least important factors in the purchase decisions of the tribal in their markets. Given their poor economic condition and infrequent availability of products for consumption, tribals largely decide on the basis of price and availability rather than the technical superiority and fashion value. (With the given accuracy level of $W = .2022$, we observe that there was some inconsistency in the responses by the respondents).

TABLE 1
Kendall's Coefficient of Concordance

Variable	Mean	Std .Dev	Minimum	Maxi.	N Label	Mean Rank
1. Price	1.98	1.02	1	5	278	11.63
2. Availability	2.07	.97	1	5	278	10.01
3. Ease of maintenance	2.38	1.11	1	5	278	7.81
4. Economy range	2.42	1.09	1	5	278	6.96
5. Comfort	2.45	1.19	1	5	278	8.14
6. Aesthetic appeal	2.53	1.28	1	5	278	5.13
7. Staring facility	2.60	1.24	1	5	278	12.21
8. Fashion orientation	2.68	1.27	1	5	278	8.03
9. Color	2.73	1.27	1	5	278	7.08
10. Multiple application	2.83	1.25	1	5	278	8.65
11. Style	3.02	1.18	1	5	278	9.14
12. Safety	3.02	1.08	1	5	278	10.92
13. Credit facility	3.07	1.12	1	5	278	5.79
14. Mortaging	3.40	1.32	1	5	278	7.46
15. Repetitive	3.62	1.40	1	5	278	7.56
16. Multiple consumption	4.08	1.08	1	5	278	9.48
Significance.		Cases.	W	Chi- Square		D.F.
.000		277	.2002	178.9819		15

Factor analysis

The tribal purchase products for variety of reasons and we have identified a large number of reasons through the preliminary study. But as a research goal, we wanted to know the major factors that are responsible for their buying behavior. The factor analysis technique was applied to reduce the original number of variables in to few numbers, so that some strategies can be suggested for improvement of the marketing network among tribal.

Factor analysis is a technique of data reduction in which we try to bring down the number of variables to the most significant ones by a method of Principal Component Analysis. We started with 16 variables in the beginning as the original data set, and elicited the respondent's opinions. Then the obtained data were tested by using principal component analysis, which resulted in few numbers of factors which are independent of each other. By this method, we tried to find the best factor explaining the variables with maximum correlation.

TABLE 2
Rotated Factor Matrix

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Performance	.28375	.22595	.14433	.78133	-.0310
User friendly	.7281	.37492	.77074	-.05484	.11012
Features	.73509	.22835	.14017	.21570	-.04076
Economy	.62959	.04073	.40829	-.45121	.03927

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	.75861	.46428	.40816	.20568	.00782
Factor 2	.50582	-.27369	-.62338	.03088	.53884
Factor 3	-.38793	.60581	-.21687	.47630	.45674
Factor 4	-.00763	.55381	-.20973	-.80576	-.00037
Factor 5	-.13457	-.18928	.59479	-.28396	.71530

To find out distinct factors explaining the key buying criteria among the tribal consumers, we chose a factor loading cut off point of .55 (Table 2)⁴.

The factor analysis resulted in grouping variables in to five factors namely:-

Factor 1: Performance

The tribals as consumers were conscious about the performance levels of various products and they reasoned that a good product should have sufficient reliability. Basically they look at the products as an expression of their value for money, and functional performance of the product is more important for them than any other product value

Factor 2: User-friendliness

In this analysis we found that an important criterion in the choice of specific products is the user-friendly nature of the product. Being illiterate and with a rudimentary level of living, the tribals tend to avoid technically advanced products, which need some expertise or operational knowledge to use it. For example the lantern was preferred more as an alternative for illumination to petromax lights because of the simplicity in use and low level of fuel consumption.

4 'Factor loading' is the correlation coefficient of a particular factor with the variable studied. Anything above .5 is treated as a high correlation.

Fact 3: Features

The buyers of household equipment's and fashion related products give importance to the factor of feature in the purchase of products. In the simplest form of buying - of beauty products, artificial jewelry, knives, and sarees, they look for variety and various features in buying than just going for simple choices. Garments were observed to be a high involvement buying for them, as they consider their preferences for color, print and texture before making a buying decision.

Factor 4: Convenience

Due to high hill habitation and simple housing patterns, convenience in the purchase of products was considered as an important factor. They have to come down to the down planes for attending weekly markets, so anything found heavier and involving lifting were normally avoided by them. Another reason of not going for buying anything larger in size is the space available at their home. They have a typical housing pattern in which there is little available inside and the door is small in size. This is a typical tribal housing pattern which protect their children from wild animal attack when they are fast asleep. It also helps them in keeping the house cooler in the summer. So products of bigger size and heavier in weight were normally not preferred by them.

Factor 5: Economy

Economy was the most important decision criterion for many of the buyers. Looking at the irregularity of their income, poor cash holding, larger family sizes and frequent money-lending behavior, they confine their purchase decision to the buying of basic value products. So they looked for products which are economical and could suit to their pocket.

The multiplier effect model

In the multiplier effect model, enunciated by Samuelson, the basic proposition is that money spent by a community does not stop moving after it is spent, rather it circulates through the economy of the community. When the income from the agricultural produce is spent in a community, it becomes income for other people living in that community. Part of this income is spent, which generates income for others to spend. Thus, money changes a number of times and is spend and re-spend. The impact of this expenditure on a community's economy will go on multiplying if it is

spent and changes hands again and again. The intensity of the multiplier depends on the proportion of the income from the community which is redistributed to other branches of the community's economy. The formula is as follows:

$$K = 1/(1 - DC/DY)$$

Where, K = Multiplier, DY = Change in Income, DC = Change in Consumption.

To estimate the multiplier rate, it is necessary to determine the expenditure pattern in a community. The per capita expenditure has to be broken down into a number of items such as accommodation, food and beverages, purchases, transport, recreation and entertainment. In the second stage, the direct beneficiaries of their income within the community in the first round will spend some of their earnings on other products and services. Similarly in the third round, the beneficiaries of the second round of expenditure will spend some of their incomes on goods and services and subsequently the money gets multiplied.

This model can be applied on Dongriya Kondh community because they are geographically concentrated and isolated from other communities and job division is prominent in the community. It was possible to identify the sectoral breakups during the research. The sample of 278 respondents was chosen for application of the multiplier effect model for Kondh community. Since no earlier studies in Orissa are available the model developed by NCAER (National Council of Applied Economic Research) was taken as a model for calculation. The leakage identified in the study is due to import of various commodities from other community to this community. The model of leakage and the estimated annual turnover of Kondh community expenditure for various sectors are detailed in Table 3 and Tables 4 respectively.

TABLE 3
Model of leakage

Sector	Transaction levels		
	Three	Four	Five
Accommodation	22	40	44
Food & beverage	35	37	55
Transport	42	45	55
Shopping	41	41	47
Entertainment	30	42	41

Source- *National Council of Applied Economic Research Survey Report*

TABLE 4**Estimated annual turnover by category of Rs. 1000 of community expenditure**

Category	Transaction levels					Spending	Total
	Annual of Turnover Spending Per Rs.	One	Two	Three	Four		
Acommodation	488	488	381	228.60	130.30	1715.90	3.51
F &B	283	233	184	117.72	54.15	921.82	3.25
Transportation	92	92	53	29.88	13.44	280.68	3.05
Shopping	127	127	75	44.95	24.27	398.15	3.13
Entertainment	10	10	7	4.09	2.45	33.54	3.35
Total	1000	1000	700.24	425.24	224.61	3350.09	3.35

From Table 4 :-

DY = Rs. 3350.09

DC = Rs. 3350.09 – Rs. 1000

= Rs. 2350.09

$K = 1 / (1 - DC/DY)$

= DY / (DY - DC) = 3.35

This high level of overall multiplier effect for the Kondh community (3.35) is a healthy sign of growth and implies that the increase in the spendable limits of the Kondh community is largely due to the over all development in their life. The recent attempts by the government, including DKDA and other non-government organisations, are delivering real benefits to the tribal of Orissa. The opening up of a cold storage for keeping the fruits and vegetables fresh over a longer period of time is giving flexibility to the tribal farmer to sell at an appropriate time. By this he can command a good price which will help the suffering Dongriyas to live a modern life and aspire for better products and services reflecting an urge for a better standard of living. To support the findings from the application of Multiplier Effect Model, it can also be mentioned here that the government has started initiatives to establish a fruit processing and juice making plant to be operational under the self help groups managed by tribal youths in the area.⁵

5 Though self-help groups are formed for women, they are managed by males, mostly youth who have some education.

Conclusions

One of the ways of capturing the growth rate of a community is to consider the changes in the pattern of living, psychographics and enhancement of living standards by the use and acquisition of modern amenities of living. In this case the better opportunity provided through voluntary and government network for marketing the tribal produce of the Dongriya Kondh community has helped them to use modern amenities of living and centralise their scarce resources for future sale and use. The multiplier effect index reflects the benefits of an effective marketing system that has evolved in bringing growth to the Dongriya Kondh community in Orissa. □

References

- Bikram Sarkar. 1981. 'Defects in Land Reform Administration'. *Mainstream*. February 14, 1981.
- G. Narasimha Murthy and P. Indrasen Reddy. 1995. 'Rural Consumer protection in India'. *Khadigramodyog*. May, pp. 420-421
- I. Satya Sunderam. 1995. 'Public Distribution System: An Evaluation'. *Indian Consumer Cooperator*, October- December. pp. 31-32
- Jai Prakash Jha. 1992. 'Food Distribution in Tribal Areas'. *Yojana*. May 15, pp-6-7
- S.C. Bhatt. 1992. 'Is revamped PDS benefiting the people'. *Kurukhetra*, May 1992, p-6
- S Santiago. 1975. 'A testament of faith in self help.' *Yojana*, March 1, p-31.
- Vinod Kumar. 1993. 'Limitations of Voluntary effort in Rural Development'. *Kurukhetra*, September, pp 17-19
- Vipul Srivastava and Jayant Nadkarni. 1999. *Tribal Produce Marketing: Contextual Realities*. New Age. ●