



LIVELIHOOD SECURITY STATUS IN THE DRYLAND AREAS OF BELLARY DISTRICT, KARNATAKA

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ABSTRACT

Though dry lands constitute over 40 per cent of the earth's surface and contribute a lot to food and nutritional security, they still continue to be 'unappreciated gifts of nature'. Poverty continues to thrive in these lands and even when there is a high correlation between poverty and dryness, most investments in development still get made in to what is considered as high potential areas. Thus marginalization of the dryland regions in the world has contributed to the persistence of poverty and continuing concerns about malnutrition, water insecurity, land degradation, and poor dissemination of improved technologies. This paper is an attempt to analyze the livelihood security status of the two dry-land taluks (Hadagali and Kudligi) in the Bellary district of Karnataka. The objective of the paper is to construct livelihood security index of the households by identifying the existing agricultural and non-agricultural activities of all the 120 sample households classified under marginal, small and medium households. Such an analysis would reveal several pressing needs of the dryland population which in turn would be helping in targeted policy advocacy. The study revealed that income from agriculture and allied activities formed the major share (86.7per cent) of the sample households with medium land-holdings, and lowest among marginal households (42.62per cent). Though livestock played vital role in supplementing the family income it was also found that rearing of sheep and goat as not profitable. The share of borrowings exceeded 50 per cent in all the households. The medium households were found to be well-off when compared to others but it was also found that their total consumption expenditure slumped by 34.2 per cent during the period of lean agriculture. It was found that during lean season the marginal households were able to fend themselves off better as they could switch to other non-agricultural options but small and medium households find it difficult to pursue options other than farming. In general the overall livelihood security index was high among medium (53.65 per cent) when compared with small (46.43 per cent) and marginal households (38.44 per cent).

KEYWORDS: Drylands, households, composite index, livelihood security status.

INTRODUCTION

The drylands make up to over 40 per cent of the earth's surface. They have been described as 'unappreciated gift' of nature and unfortunately many people and institutions consider them as wastelands. But besides being agriculturally important as 29 to 45 per cent of the currently cultivated plants owe their origin to drylands (FAO, 1990) and as nearly as 50 per cent of the world's livestock get succour, as an ecosystem with extensive unutilized surface area across the globe, drylands can also store large amounts of carbon- both in soil as well as in vegetation. Poverty poses to be the continuous challenge in drylands. There is evidence of a positive correlation between poverty levels and dryness and yet most investments in development have been made in what is considered as high potential areas (Chinnadurai, 1996). Marginalization of the dryland regions in the world is reflected in the persistence of poverty and continuing concerns about malnutrition, growing constraints of the natural resource base, water insecurity, land degradation, lack of infrastructure, poor dissemination of improved technologies and further economic liberalization (World Food Programme, 1998). Nationally, out of 143 million ha of agricultural lands, 47 million ha are drylands spanning over 128 districts of the country. Karnataka happens to be the driest state in India after Rajasthan. The total cultivated

area in the state is 9.85 million ha, comprising 51.4 per cent of the total geographical area of the state, out of which only 2.38 million ha is irrigated (24.17 per cent). There are two major rainfall deficit areas in the state with an annual rainfall of 500-600 mm, both lying in Northern-interior Karnataka, of which Bellary district has been taken into study. In the present study, an attempt has been made to analyze the livelihood security status of the two taluks (Hadagali and Kudligi) in the Bellary district of Karnataka. The specific objective of the study was to identify the existing agricultural and non-agricultural activities or practices followed in the dryland area so as to construct the livelihood security index and to analyze the best options available for ensuring livelihood security.

METHODOLOGY

To estimate the livelihood security status, the following components were included: income and assets, food and nutrition, education, participation, water, sanitation, primary health and reproductive health. Each of these components was identified separately in the study area and an aggregate measure of livelihood security was derived. The appropriate weights were given to each of these indicators and it was ensured that large variations in any one of these indicators would not excessively dominate the

contribution of the rest of the indicators and distort the inter category comparisons. These indices helped to classify the sample respondents based on a set of large multivariate data. The collected data pertains to the year 2009-10. Bellary comprises of seven taluks. Out of which Hadagali and Kudligi taluks were chosen for the present study as they had the largest area under drylands – 81.12 per cent and 85.00 per cent respectively. In all 120 sample respondents, at the rate of 60 per taluk constituted the universe or the sample framework. Three revenue villages were randomly selected from each taluk. Respondent households were also randomly selected and 20 households were assigned to each of the villages. Personal interviews were carried out with the members of the selected households with the aid of the structured interview schedule.

Analytical Framework

The analysis comprised of estimating the household income, expenditure, consumption level, yield gap and also the cost and net returns of major crops which had serious implications upon livelihood security status.

Anova

Analysis of Variance was carried out for different size groups of farm households, viz., marginal (< 1 ha of land), small (1-2 ha of land) and medium (>2 ha of land).

Lusk Co-efficients

In order to overcome the age and sex differences of individuals in a household, the data were converted into consumption units by using Lusk Co-efficients (Jain, 2000) as follows:

Consumption group	Consumption unit under Lusk Co-efficient
Male above 14 years	1.00
Female above 14 years	0.83
Children between 10 and 14 years	0.83
Children between 5 and 10 years	0.73
Children below 5 years	0.50

TOOLS OF ANALYSIS

i) Composite Index

There were 120 sample households and 8 indicators in all under purview. The values of indicators for each category of famers were standardized by employing the formula,

$$Y_{id} = (X_{id} - \text{Min } X_{id}) / (\text{Max } X_{id} - \text{Min } X_{id})$$

X_{id} – is the observed value of i^{th} parameter and d^{th} farmer ($i = 1,2,3,\dots,m, d= 1,2,3$).

Where, $\text{Min } X_{id}$ and $\text{Max } X_{id}$ are the minimum and maximum of ($X_{i1}, X_{i2}, \dots, X_{in}$) respectively.

$$Y_{id} = (\text{Max } X_{id} - X_{id}) / (\text{Max } X_{id} - \text{Min } X_{id})$$

Obviously, the standardized indices lie between zero and one. The level of livelihood security of d^{th} farmer is assumed to be a linear sum of Y_{id} as

$$Y_{id} = \sum W_i Y_{id}$$

Where W is ($0 < W < 1$ and $W_i = 1$) are the weights determined by

$$W_i = k / \sqrt{\text{Variance } (Y_i)} \text{ and } K = (\sum 1 / \sqrt{\text{Variance } (Y_i)})^{-1}$$

ii) Livelihood Security Index

Livelihood security is composed of educational security, women empowerment, health security, food and nutritional security and economic security (Ghanim, 2000). Allocating variables to each of these securities and providing scores to the variables in turn, the sample respondents were classified as high, medium and low based on the composite index. The variables included under Educational Security were: Literate (college level); Literate (11th to 12th standard); Literate (6th to 10th standard); Literate (1st to 5th standard) and Illiterate. The scores were allotted in descending order i.e. ‘score 5’ for ‘literate (college level) variable’ and ‘score 1’ to ‘illiterate variable’. The same scoring pattern was followed for all the variables included under other indicators also. Food Security component was divided into various sub-components: frequency of food consumption; quality of

food consumption and source of food items. Under frequency of food consumption, the variables included were: Food consumption daily 3 times; Food consumption daily twice but thrice occasionally; Food consumption daily twice; Favouritism among the children and Favouritism among the sex of children. Quality of food consumption comprised: Taking meat once in a month and vegetables & fruits daily; Taking of meat, vegetables and fruits occasionally; No meat but taking vegetables & fruits occasionally and No meat and taking vegetables & fruits rarely. Purchasing exclusively from private outlets; Purchasing from both private and PDS; Purchasing exclusively from PDS and Dependence on kind pursuits given as wages were the variables included under source of food items.

Health Security included considering Primary Health, Reproductive Health, Water and Sanitation sub-components. The variables under Primary Health were: Able to utilize the services of private clinics if needed; only able to utilize a PHC or a govt. hospital and Only traditional medicines or household remedies. Reproductive Health sub-component included: Resorting to pre-natal and post-natal care; Resorting to pre-natal care alone; could afford delivery or child birth in hospitals and could afford delivery only at home. The sub-component of Water consisted: Own bore well+ water connection; Water connection from Panchayat; Common tap near the house; Hand pump/well within the village and Utilizing the water sources of other villages.

Under Women Empowerment apart from the Literacy level, the sub-components of Employment and Community Participation were also included. As the variables under Literacy level being already dealt with, under Employment the included variables were: Employee in govt. or private or farming; Employed as farm labourer or share cropper and Unemployed or dependent. And under Community Participation, the variables were: Leader in local organizations/ committee; Member and

active participant of a group; Member but not an active participant and None of the above. Under the indicator of Economic Security the following were the sub-components: Type of the house owned, Ownership of land, Size of owned land holdings, Irrigability of land, Ownership of livestock, Ownership of durable assets, Source of income, Based on Income earned / annum, Based on savings, Based on borrowings, Based on electricity and Based on fuel used for domestic purpose.

Variables in 'Type of the house owned' included: Pucca house/terraced; Tiled house (concrete); Tiled house (mud) and Hut. Owned land and No owned land/ tenancy were the variables under Ownership of land. The variables: 5 acres and above; 2 to less than 5 acres and Less than 2 acres were included under Size of owned land holdings. Irrigability of land consisted: Exclusively irrigated; partly irrigated and partly rainfed and exclusively rainfed variables. Ownership of livestock included: Possession of milch animals only; Possession of milch and draught animals; Possession of draught animals only and Possession of goat/sheep/ poultry in uneconomic numbers. Ownership of durable assets comprised of: Assets worth > Rs.1 lakh; Assets worth > Rs.50,000 but < Rs.1 lakh; Assets worth > Rs.10,000 but < Rs.50,000 and Assets worth < Rs.10,000. Source of income constituted Income from agriculture/ allied / local occupation; Income from others and not from local sources and Income solely from agricultural labour. The variables of the subcomponent 'Income earned / annum' were: Rs. 1 lakh and above per year; Rs. 50,000 to < Rs. 1 lakh; Rs. 20,000 to Rs.50,000; Rs.10,000 to Rs.20,000 and Less than Rs. 10,000. Based

on savings, the variables included were: Purchase of national saving certificates +insurance + bank savings + liquid cash; Insurance + bank savings + liquid cash; Postal savings + bank savings; Postal savings alone and None. Based on electricity the variables consisted: Household with electricity and Household without electricity. The sub-component of Based on borrowings included: No borrowings; Borrowings from organized sectors; Borrowings from both organized & unorganized and Borrowings from unorganized sectors. Based on fuel used for domestic purpose, the variables included: Use of gas stove; Use of ordinary (kerosene) stove; Using own wood for domestic kiln and Getting or buying wood from others.

RESULTS AND DISCUSSION

i) Family Composition

The analysis of the details of the family composition of the sample households revealed that even with the high percentage of the number of males (51.12 %) in marginal households, the number of earners per household was very low (47.68 %). This puts them in a very much precarious condition as the marginal households have been identified with low status among the three in regard to livelihood security status (Table 11).

ii) Income and assets

Livelihood in a rural area is always synonymous with the possession of lands. As table 1 reveals that the dryland area formed 95.56 per cent of the total area of the sample farm households, it was observed that the possibility of a successful crop raise was only for certain months in a year.

TABLE 1. Land holding pattern of the sample farm households in the study area (in hectare)

Sl. No.	Particulars	Households with marginal land holdings	Households with small land holdings	Households with medium land holdings	Study Area (All samples)
1	Total area	0.98	2.01	5.30	2.76
	Value (Rs. lakh)	1.37	2.77	8.57	4.23
2	Dryland Area	0.98	1.91	5.03	2.64
	Value	1.37	2.51	7.91	3.93

TABLE 2. Details of annual income of the sample households in the study area (Amount in Rs.)

Sl. No.	Particulars	Households with marginal land holdings	Households with small land holdings	Households with medium land holdings	Study Area (All samples)
1	On farm income	13958.32	26143.90	84917.75	41673.32
2	Off farm income	11144.13	15751.98	12738.75	13211.62
3	Non-farm income	26664.72	9399.55	14978.50	17014.25
4	Total income	51767.15	51295.44	112635.00	71899.20

While income from agriculture and allied activities formed the major share (86.7 %) of the sample households with medium land-holdings, it was only 48.49 per cent in the case of marginal landholdings as per the Table 2. The results revealed that the sample households with marginal landholdings were seeing out non-agricultural options also

to maintain their livelihoods. The usual non-farm activities identified in the study area included: hiring out machines and draught animals, tailoring, fruits and vegetables selling, limestone selling, fertilizer shop, grocery, factory work and construction.

TABLE 3. Details about average number of days employed per annum of the sample households

Sl. No.	Particulars	Households with marginal land holdings	Households with small land holdings	Households with medium land holdings	Study Area (All samples)
1	On farm	45	215	250	170
2	Off farm	60	50	20	43
3	Non-farm	78	16	42	45
4	Total	183	281	312	258

As Table 3 shows out, the average number of days of employment per annum was very low in the case of households with marginal landholdings (183) when compared with the average of the study area (258). At the same time households with marginal landholdings

involved less in agricultural activities as their percentage of employment in off-farm activities (32.78 %) and non-farm activities (42.62 %) was found more than the study area average.

TABLE 4. Cost and return analysis of livestock activities in the sample households of the study area

Sl.No.	Particulars	Cost (Rs.)	Returns (Rs.)	Net returns (Rs.)
1	Dairy activities	1286.48	9930.26	8643.78
2	Sheep	623.75	1056.50	432.74
3	Goat	1267.24	1784.13	516.89

It could be seen from table 3 and 4 that livestock play vital role in supplementing the family income, as the households with limited land holdings involved in off-farm activities to a considerable extent. At the same time,

table 4 portrays that rearing of sheep and goat was not profitable as they were maintained in uneconomic units whereas there seems to be considerable amount of income flow in the dairy sector.

TABLE 5. The potential yield of major crops grown and their yield gaps in the study area (qtls/ha)

Sl.No.	Particulars	Average potential yield possible	Average yield in the sample farms	Yield Gap
1	Jowar	26.00	18.50	7.50
2	Maize	55.00	45.00	10.0
3	Cotton	15-	7.31	9.19
4	Groundnut	25-	9.95	17.5

TABLE 6. Details about the type of buildings of the Sample households in the study area

Sl. No.	Type of Buildings	Households with marginal land holdings	Households with small land holdings	Households with medium land holdings	Study Area (All samples)
1	Number of Huts	0.12	0.05	0.00	0.05
	Value (in Rs.)	3,450.00	1587.30	0.00	1679.10
2	Number of Tiled mud houses	0.76	0.89	0.75	0.80
	Value (in Rs.)	82380.95	87941.18	75375.00	81899.00
3	Number of tiled cement houses	0.12	0.06	0.42	0.2
	Value (in Rs.)	8235.29	7142.85	49625.00	21667.70
4	Number of terraced houses	0.00	0.05	0.12	0.056
	Value (in Rs.)	0.00	6349.21	45000.00	17116.40

TABLE 7. Details about durable articles of the sample households in the study area

Sl. No.	Type of Durable articles	Households with marginal land holdings	Households with small land holdings	Households with medium land holdings	Study Area (All samples)
1	No. of television sets	0.52	0.36	0.57	0.48
	Value (in Rs.)	3382.35	2726.19	4355.00	3487.85
2	No. of telephone connections	0.41	0.38	0.65	0.48
	Value (in Rs.)	976.47	1055.55	1882.50	1304.84
3	Number of cycles	0.29	0.30	0.60	0.39
	Value (in Rs.)	570.58	414.28	955.00	646.62
4	Number of motorbikes	0.00	0.01	0.10	0.04
	Value (in Rs.)	0.00	793.65	5150.00	1981.22
	Total (in numbers)	1.22	1.05	1.92	1.40
	Value (in Rs.)	4929.40	4989.67	12342.50	7420.52

The cropping intensity (the number of times the land is under cultivation in a particular year) of the study area was found to be 100 per cent. The more the cropping intensity the more would be the agricultural activity in a region as there would be continuous employment throughout the year. But it seems that with only a few months of agricultural occupation the households (especially the marginal) have to be in continuous search of other means

to fend off their livelihood security status for the remaining period. Added to this, as the table 5 reveals, when compared with the average yield of crops in the state-the study area witnessed yield gaps. As the yield gaps result in severe dent in agricultural incomes, the livelihood security status is impacted directly. Analogous to having a gooseberry in palm, it is sure that with the yield gaps getting reduced the standard of living would

ceaselessly improve. As Table 6 reveals, 5.10 per cent of the sample households in the study area lived in huts. In the case of marginal households 12.00 per cent lived in huts and none of them lived in terraced houses. Overall maximum percentage of households (71.85 per cent) dwelt in tiled mud houses. Table 7 shows that the medium households had more number of all the durable household

articles and there was not much difference between the marginal and small households with regard to the possession. Interestingly all the households were exposed to diversified consumer markets and only the limits of their income decides their consumption as it could be seen that there is no instance of vehicle possession in the case of marginal households.

TABLE 8. Details about monetary assets of sample households in the study area (Value in Rs.)

Sl. No.	Particulars	Households with marginal land holdings	Households with small land holdings	Households with medium land holdings	Study Area (All samples)
1	Bank deposits	0.00	634.92	2575.00	1069.97
2	Jewels	28592.40	32231.71	40630.58	33818.23
3	Money borrowed	34411.76	28048.39	75825.00	46095.05
4	Total	63004.16	60915.02	119030.58	80983.25

As table 8 shows, marginal sample households fared poor with regard to the total monetary assets of the study area as 54.16 per cent of the total assets were borrowed.

Though the position of medium households was good, the share of borrowings amounted to 56.92 per cent.

Consumption Pattern

TABLE 9. Monthly consumption expenditure pattern of the households in the study area (Value in Rs.)

Sl. No	Items	Peak Period of agricultural activity			Lean Period of agricultural activity				
		Marginal	Small	Medium	Sample mean	Marginal	Small	Medium	Sample mean
1	Food	2010.51	2493.50	2320.48	2274.83	647.98	1082.06	2331.73	1353.98
2	Clothing	234.64	410.07	910.72	518.48	70.13	340.17	343.52	251.27
3	Education	92.46	398.21	542.36	344.34	93.11	169.86	508.13	257.03
4	Recreation	125.46	307.84	245.26	226.19	25.38	68.70	123.88	72.65
5	Ceremonies	174.75	398.77	624.28	399.27	54.12	143.55	130.96	109.64
6	Transport	73.88	350.3	350.08	258.08	42.77	115.25	105.41	87.81
7	Beverages	230.21	452.35	342.92	341.82	390.78	363.30	313.32	355.80
8	Medical	186.19	303.01	471.25	320.15	79.38	112.54	79.30	90.41
9	Misc. expenses	177.31	314.56	596.61	362.83	68.53	160.70	271.97	167.06
10	Non-food	1294.94	2935.13	4083.51	2771.20	824.53	1474.07	1876.53	1391.71
	Total	3305.46	5428.63	6403.99	5046.05	1472.51	2556.13	4208.30	2745.64

The consumption pattern of the sample households is furnished in Table.9. The table vividly points out when the consumption expenditure on a variety of food and non-food items was more during the times of peak agricultural activities, the livelihood standards of the households was also on a high note. The total consumption expenditure of medium households slumped by 34.2 per cent during the period of lean agriculture. Thus the period of non-agriculture presenting a slack in their livelihoods becomes

obvious and unlike marginal households they are also less prone to non-farm options.

Livelihood Security index

Table 10 portrays the varying level of well being of each category of households across different security indices of livelihood security index. In general the level of well being was high among the medium households. Except with the case of food security component (70.24) marginal households were wobbling and fared below the average level of the study area with regard to all other indices.

TABLE 11. Indicator wise level of well being of the sample households in the Bellary district

Sl. No.	Particulars	Households with marginal land holdings	Households with small land holdings	Households with medium land holdings	Study Area (All samples)
1	Educational Security	27.43	42.63	52.55	40.87
2	Food Security	70.24	73.47	74.03	72.58
3	Health Security	33.26	48.69	53.46	45.14
4	Women Empowerment	20.34	19.90	22.89	21.04
5	Economic Security	40.92	47.46	65.34	51.24
6	Livelihood Security Index	38.44	46.43	53.65	46.17
	Ranking	3	2	1	-

SUMMARY AND CONCLUSION

The study of livelihood security was carried out in Hadagali and Kudligi taluks of Bellary district, Karnataka. Three revenue villages were randomly selected from each taluk. Respondent households were also selected randomly and were stratified into marginal, small and medium households accounting for 120 respondents in all. For the assessment of livelihood security 5 indicators were identified and weights were worked out for each of the indicators. These indicators were educational security, food and nutrition, health security, women empowerment and economic security. The parameters were used as yardsticks to gauge the development and security of marginal, small and medium households. Analysis of Variance was carried out for consumption expenditure between the two taluks and also among the households, to assess the homogeneity of the area and size groups.

It was noticed that along with agricultural activities, allied activities like livestock, off-farm and non-farm activities ensured the continuous source of income for the sample households. Cropping intensity of the major crops (Groundnut, Jowar, cotton and Maize) of the study area was 100.00 per cent indicating that the agricultural lands were used only once in a calendar year, which by itself revealed that the households, most importantly agricultural labourers, had to look out for some other sources of income in lean period of agricultural activities. The households were also seen engaged in non-farm activities like construction works, trade (fruits and vegetable selling, grocery shop, limestone selling) and factory works. Added to this the existing yield gap in the major crops grown was phenomenal to go unnoticed. This only meant that the households were not realizing the potential output from their lands which directly impacted their livelihood security status. But dairying seemed to be the profitable allied agricultural enterprise for the practicing farmers with a net return of Rs. 8643.78 per annum per household. The average size of land holdings of the sample households was found to be 2.76 hectares and out of which drylands formed 95.56 per cent, thereby indicating the continuing state of agriculture to be a gambling of monsoons. Most of the households resided in tiled mud house (71.85) in the study area. The percentage of terraced houses (9.30 per cent) and tiled cement houses (29.19 per cent) was found high among medium households while the number of huts was high among marginal households (12.00 per cent). While medium households had more number of durable

household articles (like vehicles, television sets, etc.) there was no much difference between marginal and small households with respect to the possession of household articles. As regards to the average value of the durable assets, it was high among medium households (Rs.12342.50).

The percentage share of medium households employed in on-farm activities was comparatively higher while the percentage share of marginal households employed in non-farm (42.62 per cent) and off-farm (32.78 per cent) activities was greater. The average monthly consumption expenditure was high (Rs. 5,306.14) among medium households. However the average monthly consumption expenditure on food items was high among the marginal households (55.64 per cent). For non-food items, average monthly consumption expenditure was high for medium households (56.16 per cent). The monthly consumption expenditure on non-food items was high (54.89 per cent) in peak periods and low (50.69 per cent) in lean periods. In general the overall livelihood security index was high among medium (53.65 per cent) when compared with small (46.43 per cent) and marginal households (38.44 per cent).

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