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Research Article

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Livelihood Assessment of Cassava and Paddy Growing Farmers in Tamil Nadu: A Comparative Analysis

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ABSTRACT

Livelihood assessment was done for cassava and paddy farmers of Kanyakumari and Tirunelveli districts of Tamil Nadu. A sample of 60 cassava and 60 paddy growers were selected using snow ball sampling technique and data were collected using a well-structured interview schedule which was supplemented through focus group discussions. Index was worked out for all the capitals for assessing the livelihood of farmers. Of the five livelihood capitals, the index for physical and natural capital was higher followed by the social, financial and human index. The overall rural sustainable livelihood index for paddy farmers was 62 which was higher than the cassava farmers (52). Significant differences were observed between the paddy and cassava farmers in farming experience, farm size, annual income, training undergone and family labour involvement. Financial support may be provided through the banks to improve the financial capital of the farmers. Cassava based farming system need to be promoted for sustainable livelihood improvement of farming community.

Keywords: *Cassava, Paddy, Sustainable livelihood index*

INTRODUCTION

Agriculture provides livelihood to two third of the population and also provides raw material for industries. Increasing the agricultural productivity is imperative to feed the burgeoning population and thereby to reduce hunger and poverty. Food insecurity, hunger and malnutrition affect the growth and economic security of the country. At present, there is a need for "food-based approaches" to end poverty, hunger and also to combat malnutrition. In this context, cassava and paddy can provide viable options for ensuring food and nutritional security, reduce hunger and combat malnutrition. In India, cassava is mainly grown in Kerala, Tamil Nadu, Andhra Pradesh and North Eastern States for edible purpose and also for extraction of starch by the industries. Livelihood assessment of the cassava and paddy farmers help to identify the different assets possessed by them and its contribution to their livelihood. To improve the livelihood status of the farmers, the concept of sustainable livelihood framework is increasingly gaining importance in research and development initiatives for poverty alleviation, rural agriculture development and rural resources management (Ashley, 2000, Chambers, 1987).

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Broad sustainable livelihood principles underpin application of the sustainable livelihood approach, which assess how development activities fit with the livelihoods of the poor (Carney et al., 1999, D.F.I.D. 2000). Livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Carney, 1998).

Livelihood capital plays a pivotal role in healthy development of rural areas and agriculture production itself to solve the inherent problems of the livelihood of farmers as well as to enhance their capacity for self-development (Peter, 1999). Although natural resources play a central role in rural livelihoods across the globe, little research has explored the relationship between migration and natural capital use, particularly in combination with other livelihood capitals (*ie.*, human, social, financial and physical). In addition, better understanding of gaps and/or distinctions in capital assets across population groups may be useful in the development of livelihood-enhancing programs. The household's access to different livelihood capitals and opportunities will shape the potential mix of activities (Bryceson, 2002, Ellis, 1998). According to Van Rooyen (1997), agriculture has the potential to contribute significantly to economic development and transformation through stimulation of income and employment. Sustainable Livelihood Assessment (SLA) principles and frameworks are good analytical tools for identifying entry points and sequences for development interventions (Farrington, 2001). The idea of household livelihood security as defined embodies three fundamental attributes *viz.*, the possession of human capabilities (e.g. education, skills, health, and psychological orientation), access to other tangible and intangible assets (social, natural, and economic capital) and existence of economic activities (Carney et al., 1999).

Cassava and paddy are the two important food crops which provide livelihood support to the farmers of Kanyakumari and Tirunelveli districts of Tamil Nadu. In this context, it is important to understand the livelihood capitals of both the farmers to formulate suitable strategies to enhance the livelihood status of the farmers. With this background, the study was conducted to assess the livelihood capitals of cassava and paddy farmers with the following objectives.

Objectives

- To explore the key components of sustainable livelihood capitals of cassava and paddy farmers
- To provide suggestions to enhance cassava and paddy farmers capabilities for sustainable livelihood security

MATERIALS AND METHODS

The present study adopted the DFID's livelihood framework (D.F.I.D. 2000) to assess the different capitals possessed by the cassava and paddy farmers. The conceptual framework of Department for International Development provides attention to measured changes in the different factors, which contribute to livelihoods especially human, social, financial, physical and natural assets (D.F.I.D. 2000, Sreedevi, 2005). The sustainable livelihoods framework presents the main factors that affect the sources of people's livelihoods and also make typical relationship between them. Each capital consists of key indicators. To cite, human capital includes education of the farmers, training undergone by the farmers, their knowledge level about farming and labour availability.

The analysis was done among cassava and paddy farmers of Kanyakumari and Tirunelveli districts of Tamil Nadu during September 2016 to January 2017. From each district three villages were selected randomly and from each village ten cassava and ten paddy growing farmers were selected using snow ball sampling and thus the total sample was 120. Data were collected using a well-structured interview schedule which was

supplemented through focus group discussions. The farmers deriving more than 50% of their income from each crop *viz.*, cassava and paddy were selected as respondents. Data were collected on household level to identify the various capitals namely, human, physical, social, financial and natural capital. Index was worked out for each capital using the formula given below.

Capital Index = Actual score/Maximum obtainable score x 100

Actual Score is the score obtained by the respondent under the capitals.

Rural livelihood sustainability index = HCI+PCI +SCI+FCI+NCI /5

HCI : Human Capital Index

PCI : Physical Capital Index

SCI : Social Capital Index

FCI : Financial Capital Index

NCI : Natural Capital Index

RESULTS AND DISCUSSION

Livelihood capitals *viz.*, human, physical, social, financial and natural indices of cassava and paddy farmers are discussed below.

Human Capital Index:

Human capital includes the parameters namely education level of farmers, training undergone, labour availability, health facilities and experience of the farmers. Human capital enable people to pursue different livelihood strategies and achieve their livelihood objectives. At household level human capital is the number and quality of labour available and this varies according to household size, skill levels, leadership potential, health status, etc.

Table 1: Human Capital Index of cassava and paddy farmers

Parameters	Cassava farmers (n=60)	Paddy farmers (n=60)
Education	54	52
Training	06	34
Labour	61	91
Health	80	64
Experience in farming	44	64
Human Capital Index	**49**	**61**

From the above Table 1, it is clear that the human capital index of paddy farmers was 61 whereas it was 49 for cassava farmers. When we look into the individual components, it was observed that training attended by the cassava farmers was less when compared to paddy farmers so also the level of experience. The reason could be that more number of trainings were organised by the department for paddy cultivation rather that cassava cultivation. As Lynton and Pareek (1990) stated that training consists largely of well organized opportunities for participants to acquire necessary understanding and skill. Farmers' training is directed towards improving their work efficiency in farming. Hence efforts should be made to improve the capacity building of the cassava farmers. Experience was also more for paddy farmers as paddy is traditionally cultivated in that area. Labour availability is more for paddy farming than cassava farming, as paddy is a labour intensive crop and also more family labour is involved in paddy farming than cassava farming. Members of the farmers' household contribute immensely to family labour supply (Igboji Chidi et al., 2015).

Physical Capital Index

The physical capitals included transport facilities available in the village, housing type, drinking water facilities, electricity and cooking fuel available to the farmers. Physical capital refers to manmade assets and other forms of physical or hard capital making up the built environment. It comprises the basic infrastructure and producer goods needed to support livelihoods. Infrastructure is commonly a public good that is used without direct payment, consisting of changes to the physical environment that help people to meet their basic needs and to be more productive (Jonathan, 2000).

Table 2: Physical Capital Index of cassava and paddy farmers

Parameters	Cassava farmers (n=60)	Paddy farmers (n=60)
Transport facilities	67	61
Housing type	88	88
Drinking water facilities	49	38
Electricity	100	100
Type of Fuel used	36	68
Physical Capital Index	**68**	**71**

It is clear from the Table 2 that the index for electricity was 100, as the electrified houses are more in Tamil Nadu. The index for drinking water facilities was low. Transport facilities were slightly better for cassava farmers than the paddy farmers. The cassava fields are near to the households. Paddy was grown in a stretch of areas and hence the transport facilities may be limited. The overall index for paddy farmers was more (71) when compared to cassava farmers (68). Physical capital includes productive assets that can be used as tools, and communal assets, such as access to roads or local infrastructure (De Sherbinin et al., 2008).

Social capital Index

The components under social capital were relationship within the communities, membership in organisations, access to society, access to agricultural information and communication facilities available in the village. Social capital has been defined by Brown and Bean (2006) as "the repertoire of resources such as information, material assistance, and social support that flow through ties to kin, to community, and to institutions." Social capital is enhanced as the number and intensity of social ties between a focal individual and other persons increase (Hagan, 1998).

Table 3: Social Capital Index of cassava and paddy farmers

Parameters	Cassava farmers (n=60)	Paddy farmers (n=60)
Social relationship	86	58
Membership in organisation	32	33
Access to agricultural information	33	62
Peer group communication	68	63
Communication facilities	66	69
Social Capital Index	**57**	**57**

Social relationship was more for cassava famers as they live in a community when compared to paddy farmers. Membership in organisation was less for both the groups. This result is in accordance with the findings of Karamjit who stated that eighty per cent of the respondents were having no membership in any social organization while 20 per cent had membership in some organizations. Access to agricultural information was low for cassava farmers (33) whereas it was 62 for paddy farmers. As paddy is an important crop in the study area, more information was given on paddy cultivation than cassava and hence more paddy farmers had access to agricultural information. Overall social index was same for both the farmers. International experience has shown that, with adequate access to farmer support services, smallholder agriculture can significantly contribute to an increase in agricultural growth. The main aim of the farmer support programme was the promotion of structural change that is a way from subsistence agricultural production towards commercialisation of agriculture through, the provision of support services to emerging farmers in South Africa D.B.S.A. (1988). Sunanda et al., (2014) reported that as regards

to overall social capital majority of the Islanders (51%) had high social capital followed by medium (30%) and low (19%).

Financial Capital Index

Financial capital index denotes the financial resources that people use to achieve livelihood objectives (Lasse, 2001). Under financial capital, the components included were annual income of the farmers, access to credit by the farmers, savings available with the farmers and the borrowed capital. It was found that the index for annual income was more for paddy farmers (48) whereas it was 36 for the cassava farmers. Savings was more for cassava farmers (41) and for paddy farmers it was 21.

Table 4: Financial Capital Index of cassava and paddy farmers

Parameters	Cassava farmers (n=60)	Paddy farmers (n=60)
Household income	36	48
Credit availability	60	62
Savings	41	21
Borrowed capital	43	93
Financial Capital Index	**45**	**56**

Without adequate access to loans or insurance, farmers who face negative shocks, such as droughts, illness can lose some of the assets which are essential for livelihood (Diagne & Zeller, 2001). Conversely, farmers who have access to well-designed credit, savings and insurance services can avail themselves of capital to finance the inputs, labour and equipment they need to generate income; can afford to invest in riskier but more profitable enterprises (Zeller et al., 1997). As a consequence the crises analysis indicated that the poor farmer as well as the medium farmer usually avail loan of 40% towards meeting any calamities faced in their agricultural and livestock sectors (Swathi Lekshmi et al., 2008). It was found that the Islanders had low financial capital (53%) followed by medium (27 %) and high (20%) financial capital (Singh et al., 2014). Access to agricultural credit is an important element in the empowerment process (Hedden-dunkhorst, et al., 2001, Kirsten et al.,1998). Moser (1996) referred to credit as one of the accelerators of agricultural development. Access to credit can help farmers to obtain or afford the factors of production. Access to credit has long been regarded as one of the key elements in improving agricultural productivity. One of the problems that small scale farmers are faced with is a high interest rate (Machethe, 2004).

Natural Capital Index

Natural capital included the land area owned by the farmers, ownership status of cultivable land, type of land and also the number of crops grown by the farmer. The index for the land area available with the paddy farmers was more (69) when compared to cassava farmers (58). The index for ownership status of land was similar for both the farmers.

Table 5: Natural Capital Index of cassava and paddy farmers

Parameters	Cassava farmers (n=60)	Paddy farmers (n=60)
Area of land	58	69
Ownership of land	81	83
Crops grown	60	44
Type of land	65	84
Natural Capital Index	**66**	**70**

Access to natural capital may facilitate improvements to other livelihood assets such as financial capital for instance, income generation through baskets woven with locally

collected reeds (Pereira & Shackleton, 2006). Rathod (2007) in his study on livelihood of the Lambani farmers revealed that majority of the Lambani farmers (46%) had low natural capital followed by medium (35 %) and high (19%), respectively.

Relationship between the livelihood capitals of cassava and paddy farmers

The relationship between the livelihood capitals of cassava and paddy farmers is given in Table 6 and Fig .1. It could be observed that the human capital index was more for paddy farmers (61) when compared to cassava farmers (49). Physical capital was also high for paddy farmers (71). Similar findings were reported by Sheela Immanuel et al. (2017). Social capital is same for both the farmers (57). Financial capital was also high for paddy farmers (56) but in the case of cassava farmers it was 45. Natural capital is marginally high for paddy farmers (70) and for cassava farmers it was 66. The Rural Sustainable livelihood index for Paddy farmers was more (62) than cassava farmers (52).

Table 6: Comparison of the different capitals between cassava and paddy farmers

Capitals	Cassava farmers (n=60)	Paddy farmers (n=60)
Human	49	61
Physical	68	71
Social	57	57
Financial	45	56
Natural	66	70
Rural Livelihood Sustainability Index	**52**	**62**

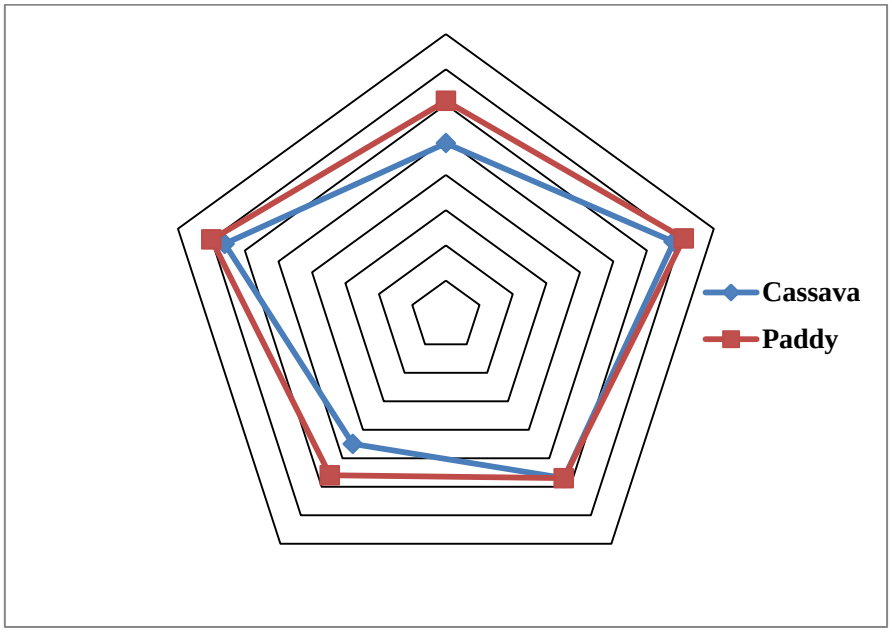

Fig. 1: Livelihood capital asset pentagon for cassava and paddy farmers

The association or similarities of different capitals between cassava and paddy farmers is given in Fig.1. Similarities between capitals of cassava and paddy farmers are in the decreasing order with respect to physical, natural, social, human and financial capitals. The socio economic characteristics of cassava and paddy farmers are presented in Table 7. The t test revealed that there exists significant differences between the paddy and cassava farmers in the variables namely farm size (2.26), experience in farming (3.93), annual income (3.50), training undergone (3.92) and family labour involvement (5.02).

Table 7: Socio-economic characteristics of cassava and paddy farmers

Variables	Cassava farmers	Paddy farmers	Mean difference	t value
Education level	2.71	2.61	-0.10	-0.34
Total farm size (ha)	1.76	2.08	0.31	2.26**
Experience in farming (Years)	2.16	3.17	1.00	3.93***
Annual income (Rs.)	1.95	2.66	0.71	3.50***
Membership in organization	0.61	0.25	-0.36	-4.32***
Access to credit	1.95	1.93	-0.01	-0.23
Access to social organization	1.90	1.86	-0.03	-0.46
Training undergone	0 .2	1.03	0.83	3.92***
Family labour involved (No.)	1.48	2.68	1.2	5.02***

*** Significant at 1 percent, ** Significant at 5 per cent,

The sources of livelihood as reported by both the farmers were agriculture, employment in government/private sector and petty business. Vulnerability context in the study area were, rampant inflation, price fluctuation, crop failure and labour cost. Trends observed were, migration of young people, price rise, drought and climate change. Major common constraints as reported by both the farmers were price fluctuation followed by lack of value addition, incidence of pests and diseases and lack of storage facilities.

CONCLUSION

The livelihood assessment gives a vivid picture about the livelihood status of cassava and paddy farmers in both the districts. It reveals the enormity and scope of tuber crops based cropping/farming system to serve as a livelihood activity, and it may be adopted in a larger scale as it contributes to livelihood. Sequential cropping of cassava followed by paddy may be adopted to maintain the soil fertility which in turn will help in food and nutritional security. The rural livelihood sustainability indicated the relative importance and the role of each capital for the development of farming. Reduction in human and financial capital would inhibit the cassava and paddy farmers to increase production scales that would lead to low livelihood diversifications. So there is a need to improve the capacity building programmes and credit facilities to the farmers and strengthen the effect of cooperative organizations and associations, thereby improving the human and financial capital of the farmers. This would enable improvement of other capitals, thereby contributing to the improvement of the livelihood of cassava and paddy farmers. Tuber crop based cropping/farming system needs to be emphasised in areas where it is feasible so as to double the farmers' income coupled with livelihood and food security of the farming community.

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