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Does Decentralization Improve Agricultural Services Delivery? — Evidence from Karnataka

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Abstract

The study has analysed the impact of decentralization of governance structure on the delivery of agricultural public services in the state of Karnataka using survey data collected from 36 *grama panchayats* through focussed group discussions. The evidence shows that discussions on agricultural issues in *grama sabhas* influence the public service delivery positively. Similarly, the regular participation of the officials of state department of agriculture in *grama sabha* meetings has a significant effect on joint agricultural activities, especially demonstrations of new technology to farmers. The study has underlined the importance of the institution and how such institutional structures can enable effective service delivery to the farmers.

Key words: Agricultural services, decentralization, services delivery, Karnataka

JEL Classification: B52, Q16

Introduction

It has been widely debated that democratic decentralisation of governance structure leads to better delivery of public services to the poor (Crook and Sverrisson, 2001; Manor, 2004; Besley *et al*., 2004; Besley *et al*., 2007). The proponents of decentralization contend that it brings the elected local government officials closer to the people; hence, makes them to understand their specific preferences and aspirations as to reasonably reflect these in the developmental planning. Decentralization is also defended on the grounds that devolution of power with adequate authority and financial resources brings greater transparency, accountability and efficiency in the delivery of services, particularly to the marginalized and vulnerable sections of the society. In fact, the direct participation of people in local planning, implementation and monitoring of developmental programmes tends to improve the quality of public goods and services. Under democratic decentralization, people hold elected officials accountable for non-performance through elections, public meetings and campaigns (Manor, 2004).

Some studies have shown mixed evidences on the impact of democratic decentralization on delivery of services to the poor. Most of the arguments put forth for lack of improvement in the quality of services with decentralization are centred on the absence of supportive conditions like political commitment to share power, mobilization of poor, accountability of elected officials, adequate resources and technical capacity in the local governments (Aziz, 2000; Bardhan, 2002; Oommen, 2004; Johnson *et al*., 2005; Robinson, 2007a). Notwithstanding, these evidences are not inimical to the decentralization of governance itself, but largely focus on the process of decentralization that aim to achieve better delivery of services to the socially-disadvantaged groups (Oommen, 2004; Robinson, 2007b). Therefore, efficiency of decentralization is contingent upon improvement of such supportive conditions as they will

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enable the local governments to provide quality delivery of drinking water, health care services, educational facilities and rural infrastructure.

The agriculture and related areas are among the functions devolved to the local governments. Since agricultural functions are complex, technical and highly heterogeneous, only those activities that are related to delivery of services and supply of material inputs have been devolved. The developmental activities, particularly delivery of services related to agriculture have been transferred to locally elected bodies. In all the states of India, except Kerala, the line departments of agriculture, horticulture, animal husbandry and fisheries continue to do planning and implementation of these sector-specific programmes with little involvement of village level local governments (*grama panchayats*[1]). However, agriculture being an important livelihood activity to the majority of rural poor who mainly comprise marginal and small farmers and agricultural labours, elected members of self-government at village level pay attention to improving conditions of agriculture either directly or indirectly (Babu, 2010).

It has been increasingly realized that decentralization of administrative responsibilities for the supply of agricultural inputs and technical services (extension) will provide easy access to farmers for improving agricultural production (Deshpande and Rao, 2002; World Bank, 2007). This actually assumes importance in the Indian context in the light of degeneration of state governments' extension services delivery system. There are evidences to show that decentralization of governance structures along with land reforms have led to improved agricultural growth in the states like West Bengal (Rawal and Swaminathan, 1998; Chattopadhyay, 2005). However, no systematic empirical studies are available dealing with how decentralization has helped to improve agricultural services delivery for achieving high agricultural growth and through which mechanism decentralized governance could influence agricultural development in villages.

Amongst Indian states, Karnataka is the pioneer in the introduction of decentralization reforms, the experience of which has been intensively studied (Aziz, 1993; Sivanna and Reddy, 2007; Besley *et al*., 2007; Babu, 2010; Kadekodi *et al.*, 2007; Rajasekhar and Manjula, 2011). But, in all these studies the link between democratic decentralization and delivery of agricultural-related public services is missing. Therefore, the present study has attempted to fill this gap, which may motivate further research in this field to gather evidences from other Indian states. In the global context, Akramov (2009) and Ba (2011) have argued that there is a relative scarcity of empirical research that connects decentralization of power and resources with delivery of agricultural-related public goods. Therefore, the present study has specifically tried to understand the importance of *grama panchayats* in the delivery of crop production and related services, and has analysed the determinants of joint delivery of agricultural goods and services with the line department of agriculture in the state of Karnataka.

Data Source

The study has used the data collected through a field survey of 36 *grama panchyats* (GPs) in Karnataka during November 2011. Since the present study was to analyse the mechanisms through which GPs can influence the delivery of agricultural public services for improving the conditions of farmers, Focus Group Discussions (FGDs) were organised to solicit information from the elected members of GPs. Although most of the GP members were farmers, some farmers who were not GP members were also included in the discussions to control the bias in the responses provided by the elected members. In addition, women GP members also participated in the FGDs. In all the group discussions, the Secretary and Panchayat Development Officer were present. Besides qualitative information, village-specific quantitative information was also collected from the GP office.

[1] *Grama panchayat*, also known as village council, is the lowest structure of local governance constituted at the village level for a population of 5,000 to 7,000 with four to five villages. Election is held at the ward level and they constitute the elected body of GP. The village president and vice-president are elected by the council members. As per the Eleventh Schedule of the Panchayat Raj Act, 29 subjects/ functions have been devolved to local governments. Under each GP, a *grama sabha*, also known as village assembly, is constituted to approve all plans for economic and social development, review panchayat finances, programme implementation and monitoring, and selection of beneficiaries for welfare schemes. The main purpose of holding *grama sabha* is to facilitate the direct participation of people in planning and execution of developmental programmes.

For conducting FGDs, three districts, viz. Mandya, Raichur and Udupi, representing different geographical locations and different levels of socio-economic development, were selected. From each district, two taluks were selected based on the size of cultivator's population and from each taluk six GPs were selected in such a way that three GPs are located close to the taluk headquarters. It was supposed that the GPs close to the taluk headquarters tend to exert more political influence and also extract more resources through securing development programmes from the taluk panchayat and line departments of the state government.

The GPs selected from Mandya were characterized by high level of canal irrigated area, dominance of politically active smallholders and presence of vibrant farmers' associations. The sample GPs from Raichur represented rainfed region, large landholders, low political activism and low literacy level. The district Udupi, located in the coastal region of the state, has high literacy rate with functioning farmers' associations and non-governmental agencies.

The cropping pattern varied across GPs with cultivation of mainly cash crops in Mandya, plantation crops in Udupi and coarse grains in Raichur. The average number of villages per GP ranged from four to seven and the number of elected members ranged from 16 to 20 (Annexure 1). The elected body was the true representative of socially-disadvantaged groups like scheduled castes and tribes (SC/ST), the reservation of seats for such groups was determined based on their population, and vulnerable sections like women whose representation was actually higher than the legally mandatory norm of one-third of total seats. Reservation to the marginalized section was made with a view to represent them in developmental programmes, but evidence shows that they continued to depend on local elites belonging to upper caste and landlords for their economic well-being (Oommen, 2004; Johnson, 2004; Johnson *et al*., 2005). Therefore, in each FGD, it was ensured that at least 50 per cent of the elected members, including SC and ST members and women, participated in the discussions.

In the present study, the participants were asked whether problems related to village agricultural activities were ever discussed in *grama sabhas* during the past two years. If discussed, details of the problems and actions taken thereon were collected through the focus group discussions. In this way, the effect of decentralisation on agricultural service delivery was captured through a dummy variable which was taken as one if agricultural problems were discussed, otherwise zero. It was hypothesized that the effective deliberations of agricultural production related problems in the *grama sabha* will have positive impact on agricultural public services delivery in the villages. The agricultural services[2] included all non-tangible and non-storable functions used by the farmers to improve agricultural productivity (Albert, 2000; Akramov, 2009). These services facilitate the farmers to access and use improved inputs, infrastructure, information and technology for improving productivity and income.

Analytical Framework

The present study is specifically focused on crop production related services, which is measured as an index of agricultural service delivery and is used as dependent variable. The index value (I_i) is normalised to range from 0 to 1 by using the following widely used mini-max method:

$$I_i = \frac{xi - \min(xi)}{\max(xi) - \min(xi)} \quad \ldots(1)$$

To analyse the relationship between decentralisation and agricultural service delivery a Tobit regression was estimated. Due to the censored nature of dependent variable, the OLS estimates are likely to be biased (Wooldridge, 2005) and hence the Tobit model was considered appropriate for the estimation. The Tobit regression in terms of latent variable is expressed as:

$$Y_i^* = \alpha_i + \beta X_i + \gamma Z_i + u_i \quad \ldots(2)$$

$$y_i = \begin{cases} Y_i^* & if\ Y_i^* > 0 \\ 0 & if\ Y_i^* \leq 0 \end{cases}$$

where, Y_i* is unobserved latent variable, y_i is the agricultural service delivery index (I_i), X_i is the vector of decentralisation variables and Z_i is the vector of village specific characteristics and u_i is the error-term with usual properties.

There are certain agricultural activities that a GP undertakes in collaboration with the department of

[2] Agricultural services are part of broader rural services, which basically include crop production, animal production, roads, drinking water, natural resources management and related aspects.

Table 1. Variables used in the construction of agricultural service delivery index

Variable	Mean value	Standard deviation
Direct activities		
Custom hiring of machinery	0.0278	0.1667
Lease-out common land for agricultural purpose	0.1389	0.3507
Bulk purchase of inputs like seeds, fertilisers, etc.	0.0278	0.1667
Identify plots for demonstration and trials	0.1667	0.3780
Identify beneficiaries of agricultural developmental schemes	0.4444	0.5040
Construction of check dams, water harvesting, etc.	0.4722	0.5063
De-silting irrigation canal	0.5833	0.5000
Construction of rural market facilities	0.1944	0.4014
Manage/supervise rural/weekly markets	0.1667	0.3780
Indirect activities		
Assist in assessing credit requirements	0.2222	0.4216
Recovery of loans	0.0278	0.1667
Distribution of inputs like seeds, fertilisers, machinery	0.3056	0.4672
Create awareness about agricultural technology	0.3056	0.4672
Crop yield estimation	0.0833	0.2803
Soil testing	0.3611	0.4871
Monitor visits of extension workers	0.3611	0.4871
Organise training programme on agriculture	0.3056	0.4672
Village roads laying and maintenance	0.6111	0.4944

agriculture for the benefit of the farmers within the villages[3]. To capture these joint activities, the participants were asked whether GP undertook any such collaboration with the department of agriculture during the past two years and the same was measured as a dummy variable. The probability of joint activities of GP was used as a dependent variable. Given the dichotomous nature of dependent variable, logit regression method was used to analyse its determinants. The maximum likelihood method was followed to estimate the parameters as the application of standard OLS procedure gives biased estimates due to the use of dummy dependent variable (Gujarati, 2004). The estimated logit regression is specified as per Equation (3):

$$Li = ln\,(Pi|\,1 - Pi) = \alpha + \beta Xi + ui \qquad \ldots(3)$$

where, P_i is the probability of joint activities, L_i is the log of the odds ratio, X_i is the vector of the explanatory variables and u_i is the error-term with usual properties. The selection of explanatory variables and justification for using them in the above models has been discussed in the subsequent sections.

[3] They include demonstration of new technology, training on use of new machineries and organising agricultural fairs/ exhibition

Results and Discussion

Relationship between Decentralization and Agricultural Services Delivery

For regression analysis, agricultural services delivery index was used as the dependent variable, which was regressed against among others, discussions on crop farming issues in *grama sabha* employed to represent one of the measures of decentralization. The expected relationship between agricultural services delivery index and discussions in the *grama sabha* was positive.

The information used to construct the agricultural services delivery index is provided in Table 1. The participants were asked whether GP undertook any of these activities[4], either directly or indirectly within the villages of *grama phanchyat* during the past two years.

[4] In the field survey, they were captured through both open-ended and close-ended questions, and then grouped under direct and indirect activities based on the nature of involvement of GPs. However, the grouping of activities is not watertight and it is mainly done for analytical purpose. For close-ended questions, activity mapping prepared by the Rural Development and Panchayat Raj Department, Government of Karnataka was used.

Table 2. Descriptive statistics of variables used in the regression analysis

Variable	Mean value	Standard deviation	Minimum value	Maximum value
Decentralisation variables				
Held *grama sabha* meetings regularly as mandated during the past two years	0.778	0.422	0.000	1.000
Constitution of a Production Committee	0.917	0.280	0.000	1.000
Joint activities with Department of Agriculture	0.611	0.494	0.000	1.000
Agricultural service delivery index	0.344	0.207	0.000	1.000
Discussed issues on crop farming in *grama sabha*	0.556	0.504	0.000	1.000
Male *Pradhan* of GP	0.694	0.467	0.000	1.000
Agricultural officers attending *grama sabha* meetings	0.444	0.504	0.000	1.000
GP-specific characteristics				
Number of tractors	23.500	19.909	1.000	70.000
Proportion of cultivator households	0.684	0.220	0.140	0.950
Proportion of cultivated area	0.737	0.586	0.136	3.870
Proportion of MGNREGA spending	0.288	0.208	0.011	0.730
Existence of Farmers' Association	0.500	0.507	0.000	1.000
Distance from *taluk* head quarters	15.333	9.233	2.000	35.000

Here, direct activities included those activities which were initiated by the GP or through developmental programmes entrusted by *taluk panchayat* or *zilla panchayat* for implementation and indirect activities included those activities that were carried out in collaboration with other agencies of line departments. Among all the activities, village roads laying and maintenance received the highest priority, followed by improving the provision of irrigation water through de-silting of irrigation canal, construction of irrigation facilities and water harvesting structures like check dams and farm ponds. Another important function that GP undertook through *grama sabha* was the selection of beneficiaries for various subsidy based agricultural schemes. It is compulsory that the names of the beneficiaries once approved should be displayed on the notice board for public information and also for tracking economic status of the beneficiaries. Some GPs also monitor visits of the agricultural extension officer who is supposed to interact with the farmers for providing technical advice. However, activities related to organization of trainings and demonstrations, which are crucial for motivating farmers to adopt new technology, jointly undertaken with line departments, seem to be limited.

Table 2 provides descriptive statistics of the variables used in the regression analyses. It can be observed that about 78 per cent of the sample GPs held *grama sabhas*[5] regularly during the past two years and only 56 per cent of them discussed issues of crop farming. Further, the mean value of agricultural service delivery index was only 0.34. Since 2006-07 the delivery of certain public services, especially those related to management of natural resources encompassing soil and water conservation, flood control, renovation of water bodies and land levelling, which have implications for raising agricultural production, appeared to have improved with the introduction of Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) (Rajasekhar *et al*., 2012). The implementation of MGNREGS has certainly invigorated the GP machineries to plan and implement the developmental works at the village level. Therefore, to capture the importance of employment guarantee programme on agricultural services delivery, the share of MGNREGS spending was used as an explanatory variable in the regression analysis. But, the much hyped MGNREGS programme's average spending on agricultural works was only 29 per cent of the total expenditure and the share of expenditure ranged from 1.1 per cent to 73.0

[5] The problems related to holding a *gram sabha*, participation and deliberation of issues can be found in Besley *et al*. (2005; 2007) and Babu (2010).

Table 3. Effect of decentralization on agricultural services delivery

Dependent variable: Agricultural service delivery index

Independent variables	OLS Model 1	OLS Model 2	Tobit Model 1	Tobit Model 2
Discussions on crop farming issues in *grama sabhas*	0.247**	0.195**	0.257***	0.201**
	(0.097)	(0.088)	(0.092)	(0.082)
Proportion of cultivator households	0.402**	0.441**	0.406**	0.456**
	(0.186)	(0.210)	(0.168)	(0.194)
Proportion of cultivated area	0.006	0.037	0.003	0.037
	(0.040)	(0.031)	(0.038)	(0.028)
Constitution of production committee	0.119*	0.076	0.112*	0.077
	(0.068)	(0.083)	(0.066)	(0.078)
Existence of farmers' association	0.102		0.096	
	(0.086)		(0.080)	
Male pradhan	-0.093		-0.100	
	(0.091)		(0.084)	
Proportion of MGNREGS spending	0.090		0.099	
	(0.197)		(0.179)	
Mandya district dummy		-0.117		-0.126
		(0.151)		(0.139)
Raichur district dummy		-0.154		-0.156
		(0.120)		(0.109)
Constant	-0.195	-0.072		-0.085
	(0.233)	(0.150)		(0.143)
Observations	36	36	36	36
OLS R^2 /Tobit log pseudolikelihood	0.331	0.280	11.006	9.803

Notes: ***significant at 1 per cent level, **significant at 5 per cent level and * significant at 10 per cent level; Heteroscedasticity corrected standard errors are given within the parentheses

per cent across the sample GPs. Therefore, it is expected that the impact of MGNREGS spending on improving agricultural public services delivery may or may not be empirically evident.

The implications of political reservation of the president (*pradhan*) of GP on the provision of agricultural services were captured through a dummy variable, which was one if pradhan was a male. Further, the village-specific characteristics such as proportion of cultivator households, proportion of cultivated area and existence of farmers' associations in a GP were also used as explanatory variables.

The estimated regression results are given in Table 3. Different specifications were tried to analyse the relationship between decentralization and agricultural service delivery, with and without incorporating the GP specific characteristics. The Tobit model was estimated and its results are presented along with OLS estimates for checking the robustness. The presence of a significant heteroscedasticity was detected by applying Breusch-Pagan test (Chi^2=9.55, prob > Chi^2=0.00) and hence, the White heteroscedasticity corrected estimates are presented. Due to small sample size, Ramsey regression specification error test (RESET) was conducted and the results [F (3,25) = 1.59, prob > F=0.217 without district dummy, and F(3,26)=0.20, prob > F = 0.892 with district dummy] showed no significant error in the specification of the models. For Tobit model, the heteroscedascity problem was corrected by using the STATA program.

The estimated results from OLS and Tobit models were similar, except for the magnitude and level of significance of coefficients which appeared higher in the Tobit model in both the specifications. In the Tobit model 1, the estimated effect of discussions on crop farming issues in grama sabhas on agricultural service delivery index was positive and significant at one per

cent level. Interestingly, the proportion of cultivator's households positively influenced the delivery of agricultural services in the villages. However, the coefficient of the constitution of production committee, which was captured through a dummy variable, was positive. It is for the reason that, except in Udupi, over 50 per cent of the GPs surveyed in other districts where production committees had been constituted, were not functional on the mandated lines of taking initiatives for improving village agricultural production and its related activities. It was learnt during the survey that the production committee members were not aware of their roles and they were mostly involved in the collection and recovery of local taxes. The positive effect of recovery of taxes was the increase in financial resources of GPs, which helped in undertaking village developmental works like construction of market complex and other facilities in the villages. The proportion of cultivated area, farmers' association, proportion of MGNREGS spending on agriculture and pradhan's gender did not significantly affect the agricultural services delivery.

Since characteristics of the sample districts varied in terms of resource endowments, political activism and agricultural production, the district dummies were introduced in the model 2 by keeping Udupi as the reference category. As expected, the coefficients of discussions on agricultural issues in *grama sabhas* and proportion of cultivators' households were positive and showed a significant influence on the agricultural services delivery. But, the GP level production committee and also farmers' associations did not help to improve the agricultural public services delivery in the presence of district dummies. It was due to the reason that these committees and farmers' association were not functioning so effectively in Mandya and Raichur as compared to in Udupi, which was actually reinforced by the results of negative and insignificant coefficients. Overall, these results imply that participation and effective deliberations on agricultural issues in *grama sabhas* influence their policy decisions positively on the delivery of agricultural public services.

Determinants of Joint Activities of GP with State Agricultural Department

It was observed during survey that the officials of the state department of agriculture tend to choose the villages nearby the taluk headquarters or agricultural fields in proximity to highways to showcase new technologies through demonstrations and trainings. It was also observed that these demonstrations were usually being conducted in the fields of large land owners, who were willing to adopt new technology, take risk and happened to be either the past or present elected members of the GP. The interior villages were not likely to get such collaborative activities from the department. Therefore, the institution of *grama sabha* can play a pro-agricultural development role and the participation of agricultural officials in *grama sabhas* is considered an important variable influencing the probability of holding joint activities.

The other explanatory variables were the presence of farmers' association and the number of tractors. While farmers' association can potentially influence the policy decisions of agricultural department through lobbying, farmers in the agriculturally-developed villages can pressurize the officials for holding joint activities with GP. In fact, the summary statistics given in Table 2 showed that only 61 per cent of the sample GPs had some joint activities with the department of agriculture and only 44 per cent of GPs reported regular participation of agricultural officers in the *grama sabhas*. The location distance of sample GPs from taluk headquarter ranged from 2 km to 35 km.

The estimated logit regression results are provided in Table 4. As expected, the distance from taluk headquarters was negatively associated with holding joint activities but was statistically not significant. However, the regular participation of agricultural officials in *grama sabhas* significantly influenced the probability of a GP conducting joint agricultural programmes within villages. Similarly, a positive and significant effect of farmers' association was observed. But, the level of agricultural development, which was captured through the number of tractors, did not significantly influence the joint activities. On the whole, it can be argued that the functioning institutional structures do matter with a greater degree of devolution for fostering agricultural development in the villages.

Conclusions

The present study has examined whether the democratic decentralization of governance has improved agricultural public services delivery in the

Table 4. Results of the Logit regression model

Dependent variable: Joint activities with Department of Agriculture

Independent variables	Coefficient	Z-value	P >z
Distance from taluk headquarters	-0.029	-0.690	0.489
Agricultural officers attended the grama sabhas	1.624	1.900	0.058
Presence of farmers' association	1.524	1.790	0.073
Number of tractors	-0.030	-1.350	0.176
Constant	0.249	0.270	0.790
Number of observations	36		
Likelihood ratio (LR) statistics	10.590		
Prob > Chi^2	0.0316		
Pseudo R^2	0.2201		

state of Karnataka. It has also analysed the determinants of joint agricultural activities of *grama panchayats* (GPs) with the department of agriculture for improving the farming condition in the villages. Various indicators of decentralization and the GP specific characteristics were collected through focus group discussions from the select *grama panchayats*. The regression results have shown that discussions on agricultural issues in *grama sabhas* positively influence the agricultural service delivery. Although it cannot be argued that discussions in *grama sabhas* have a causal effect on agricultural service delivery, it certainly underlines the importance of institution of *grama sabha*. Further, even with a little devolution of agricultural functions, GPs on their own play an important role in the delivery of agricultural services and therefore, a greater devolution of functions with adequate finance and administrative control especially over extension staff will significantly improve agricultural production. Among other explanatory variables, size of cultivators' population has a positive impact on the agricultural service delivery index.

The joint agricultural activities of GP with the department of agriculture are largely determined by the regular participation of department officials in *grama sabha* meetings, which tend to put pressure on the officials to organize the demonstrations and trainings on new technology to farmers in the villages. Interestingly, farmers' association has been found to positively influence on such collaborative activities to take place through lobbying and political activism. The study has contributed to the discussions on impact of democratic decentralisation, especially on the delivery of agricultural services. However, given the considerable period of time passed since the introduction of decentralization reforms, there is big scope for drawing more insights through an in-depth survey of large sample of village level elected self-governments across the states in India.

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Annexure I

Basic information on sample GPs in different districts of Karnataka

Particulars	Mandya	Raichur	Udupi
Number of GPs surveyed	12	12	12
Average number of villages per GP	7	5	4
Average number of members per GP	16	20	17
Percentage of SC members	19.0	20.3	6.2
Percentage of ST members	3.2	24.2	10.8
Percentage of other members	77.8	55.5	83.0
Percentage of women members	43.4	38.6	42.8
Average number of members participated per FGD	9	9	7
Percentage of GPs jointly working with the State Agriculture Department	41.7	58.3	83.3
Major crops grown	Paddy, Sugarcane, Ragi, Mulberry	Jowar, Cotton, Chilli, Red gram, Groundnut	Paddy, Areca nut, Coconut, Banana, Pepper