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Articles

Book Reviews

Trade Liberalisation and Exports in the Nigerian Economy: An Assessment

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Abstract

Various policy measures have been taken by the Nigerian government since the advent of Structural Adjustment Programme (SAP) to improve the external trade sector. This paper appraises the journey so far. Thus, it develops a mixed quantitative-qualitative model designed to evaluate export responses to trade liberalisation policies.

This paper, hypothesising a full effect of trade liberalisation in the long run, has adopted the co-integration and error correction technique to estimate the model. The results tend to suggest that trade liberalisation is mildly effective. Thus, there are areas that raise some doubts about the potency of trade liberalisation to bring about the desired economic growth and development propelled by international trade. This model can be used to evaluate the effectiveness of policy shifts, and hence its appropriateness to provide a background for fine-tuning policy to achieve the overall economic objectives.

Introduction

International trade is the life-line of the Nigerian economy with total trade representing about 26 per cent of the GDP in 1986, about 66.3 per cent in 1996 and 57.6 per cent in 2001. With these proportions of trade to GDP, it is obvious that securing and enhancing access to the world markets should be a vital element in Nigeria's external trade policy formulation and implementation. Thus, Nigeria started on the path of serious economic restructuring, particularly in the area of trade policy reforms, with the introduction of Structural Adjustment Programme (SAP) in 1986. A major platform of this is trade liberalisation popularised by commercialisation, privatisation and deregulation. Today, the growing extent and depth of globalisation and regionalisation has added impetus to the urgent need to bring about freer trade in goods and services.

Prior to SAP, Nigeria embarked on Import Substitution Industralisation (ISI). However, theoretical considerations weighed heavily in favour of outward-oriented strategies. It was this that led to sustained agitation for a review of Nigeria's

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trade policy. Thus, national trade policy was then backed by seemingly conducive international trading environment as contained in General Agreement on Tariff and Trade (GATT) and World Trade Organisation (WTO) documents.

In testing whether trade liberalisation has achieved the desired objectives, many authors have carried out a micro-economic analysis of the impact of the policy shift (resulting from the positive effect of trade liberalisation) on firm performance, employment, productivity, output, mark-up price, and market structure (Epifani 2003; Wacziarg 2003; Fernandes 2002; Pamukcu 2000; Adenikinju and Chete 1999; and Krishna and Mitra 1998). A few others have considered the consequences of trade liberalisation on the macro-economic aggregate (Shafaedin 1994). This study intends to contribute to existing literature by providing further empirical evidence on the impact of trade liberalisation on export performance in Nigeria. It is expected that the study will also sharpen our understanding of the linkages between export and major macro-economic variables, thus providing the impetus for investigating the effect of trade liberalisation policies on exports. Hence, we construct a model designed to capture the effectiveness of trade liberalisation policy on Nigeria's exports.

The paper is structured as follows: Section 2 reviews the literature; Section 3 examines the framework for our analysis; Section 4 provides the estimation results and comments; and in Section 5, we conclude.

Nigeria's External Trade Sector: An Overview

The economy of Nigeria is structurally dependent on trade relations with her major trading partners: Britain (her former colonial master) and other industrial nations. According to Alege (1995), this dependency, largely unidirectional, has fashioned the structure of resource allocation, domestic production, direction of exports and origin of imports. Thus, Nigerian export to African countries is very low; and even exports to members of ECOWAS are generally low with unaccountable trade seemingly taking a lion's share.

At Independence in 1960, the composition of Nigeria's export was mainly primary products such as cocoa, groundnut, cotton, palm oil, rubber etc. By the end of the following decade, crude oil export became the major foreign exchange earner and source of funding public expenditure. In this regard, in 1975, crude oil export earnings represented 91.6 per cent of total export and 71.9 per cent of government revenue. By 2002, oil and gas exports accounted for about 98 per cent of total export earnings and for about 83 per cent of federal government revenue. Non-oil export has taken a historical downward trend since the discovery of crude oil in commercial quantities in the early 1970s. By 1970, non-oil export stood at 6.17 per cent of the GDP and 0.69 per cent in 1985. In 2002, the share of non-oil export in the GDP has fallen to below 0.36 per cent. Manufactured products, a component of

non-oil export, suffered the same setback. The sector is being faced with stiff competition from the more efficient and low-cost international competitors.

The Nigerian imports mainly comprised consumer, intermediate and capital goods. However, over time, the import of finished consumer goods has also taken over the largest proportion of total imports. Similarly, the volume of total trade as a share of the GDP (i.e. the degree of openness) has been on the decline. In 1970, it stood at 32 per cent, 40 per cent in 1975 and fell to 20 per cent by 1986. It resumed an upward trend from 1988 to reach 86 per cent in 1995 and fell to about 58 per cent in 2001. By 1970 and early 1980s, the Nigerian economy was not exempted from the "Dutch-disease" phenomenon of crude-oil discovery. As the crude-oil price politics was taking a strategic position in the world economy, reshaping of the Nigerian socio-economic landscape was also taking place. Crude oil earnings boosted the average income of urban dwellers provoking a serious rural-urban movement. This led to high pressure on socio-economic infrastructure in the urban centres. The rural areas were depleted of the required manpower for the production of exportable crops. The situation was aggravated by the fact that these exports goods were mainly primary products with little or no value addition.

Meanwhile, the economy was faced with other macro-economic problems -- slow growth, inflationary pressure, balance of payments deficit, growing external debt stock and government budget deficit. As a response, the government embarked on import substitution strategy and pursued a protectionist trade regime. Tariffs were prohibitive. Import licensing, quotas and bans were rampant and the domestic currency was particularly overvalued. Exports were under the control of the bureaucrats in the form of marketing boards. In addition, various incentives were put in place to encourage non-oil exports with little or no response.

In an attempt to stimulate economic growth concomitant with a viable balance of payments in the medium-run to long-run, the government, by 1986, embarked on a comprehensive Structural Adjustment Programme (SAP). A major component of this programme was trade liberalisation. The contention was that trade liberalisation would be accompanied by productivity, growth, technological advancement, increasing competition of resource towards more efficient firms.

In Nigeria, trade liberalisation has taken various forms, including tariff policy, investment enabling policies, institutional development and export promotion policies. Tariff policy structure was reviewed to stimulate competition and efficiency by reducing tariffs on consumer items relative to tariff of raw materials in intermediate and capital goods. The reduction of tariff on final consumer goods would expose domestic manufacturer to import competition while relatively higher tariff would attract investment into raw materials and intermediate goods production.

Import liberalisation has a continuity in policy design and implementation in Nigeria. In every budget of the Federal Republic of Nigeria, there is always import tariff adjustments, review of existing prohibited items either subtracting

one or adding another item(s). The export policy component of trade liberalisation consists of duty draw-back scheme, export expansion grant, manufacture in bond schemes, export preshipment inspection by private companies and the establishment of export processing zones (EPZs).

In the trade liberalisation package, investment enabling policy occupied a privileged position. Several policies were introduced in order to stimulate private participation in the economy and reduce influence of the government in productive activities. Some of these policies were: interest rate regime, guided privatisation, administrative and legal reform, review of laws inhibiting competition, capital market reform, multilateral and regional agreements and tax reforms.

Finally, the Nigerian version of trade liberalisation included several institutional changes in order to ensure effectiveness of the new trade policy. These institutions included establishment of Nigerian Investment Promotion Council, NIPC, which provided for a foreign investor to set up business in Nigeria with 100 per cent ownership. It also consisted of the establishment of Bureau of Public Enterprise (BPE), as well as membership of some multi-lateral and regional bodies. In this regard, Nigeria is a founding member of WTO and she is also a major player in ECOWAS Trade Liberalisation Scheme.

Despite almost two decades of trade liberalisation, the trade environment in Nigeria remains constrained. This paper intends to throw more light on this. In this regard, we have noted that several authors have been skeptical about Nigeria's ability to adequately respond and position herself in the world market largely due to domestic constraints. In this respect, we can mention Adalemo (1993), Adenikinju and Chete (1999), and Alege (1993). One of the issues as already stated is that Nigeria's export market sector is structurally dependent and is characterised by export of primary products, essentially crude oil, and declining proportion of agricultural products. Other points of discontent are the lopsidedness of the world trading system and a dominant mono-cultural sector: the peripheral economy syndrome.

Framework for Analysis

Trade liberalisation is a policy mix designed to influence the target variables through some other intermediate variables. Thus, these policy instruments impact the aggregate means of production, the degree of openness of the economy, the exchange rate of the national currency and the general level of the economic activities. These variables contribute towards determining the actual level of real export supply.

In standard export models, world income which determines a country's purchasing power and the terms of trade (i.e., ratio of price of export to price of import) are often used as explanatory variables. In this paper, we introduce new

considerations that influenced the type of variables included in the model. Besides the terms of trade (TOT), we considered the gross domestic product (GDP) which explains the overall economic capability to respond to export demand. The degree of openness (OPN) is seen as a success factor in trade liberalisation effort and level of import which can be viewed as a factor of production. According to Carmicheal *et al* (1999), imports "take account of the situation in developing countries since they generally rely heavily on imports from the rest of the world for capital goods". Our contention in this study is that import liberalisation policy will enhance imports and this, in turn, will promote export supply.

In specifying our export model, we assume non-linearity between export and the explanatory variables, non-restriction in parameters, a homogeneous function of degree one in price and a multiplicative error term. We then write the equation as:

$X_t = \alpha . Y_t^{\alpha 1} . TOT_t^{\alpha 2} . OPN_t^{\alpha 3} . M_t^{\alpha 4} . U_t$ …….....……..... (1)

After log-linearising equation (1), we then introduce three dummy variables in the usual manner and four special dummy variables to capture structural changes in intercept and slopes respectively. Equation 1 then becomes:

$$x_t = \alpha_0 + \beta_0 D1 + \alpha_1 ye_t + \tau_1 Dye_t + \alpha_2 tot_t + \tau_2 Dtot_t + \alpha_3 opn_t + \tau_3 Dopn_t + \alpha_4 m_t + r_4 Dm_t + \beta_1 Dmac + \beta_2 DPOL + v' \quad (2)$$

$v' = 1n\mu_t$

where lower cases of variables represent their logarithmic transformation and the stochastic random term, v^1, and such that $E(vi) = 0$; $E(vi, vj) = 0$ if $i \neq j$ and $E(vi, vj) = \sigma^2$ if $i = j$. The description of the variables in the models is contained in Table 1 while the expected signs and interpretations of the parameters have been shown in Table 2.

Estimations and Results

Method of Analysis

The data used in this study were obtained from the Central Bank of Nigeria online through its website www.cenbank.org/data.asp. The study covers the period 1970 to 2001. All variables have been deflated using the GDP deflator. The variables used in the model are as defined in Tables 1 and 2. We have adopted two econometric methods in this paper. The first is the multiple regression approach and the second is the cointegration and error correction technique. We have used the Microsoft software package.

Table 1: Description of Variables

Variables	Description of variables
X	Total export of goods and services.
NX	Total non-oil export.
Y	Output of tradable goods proxied by real GDP.
TOT	Terms of Trade proxied by nominal effective exchange rate.
M	Total imports of goods and services.
OPN	Degree of openness of the economy measured by *(X+M)/GDP*
DU..	Special dummy variable defined for each regressor as zero before trade liberalisation and the actual value of the variables after.
DMAC	Dummy variable to capture macroeconomic policy inconsistencies and it is defined to take the value 0 between 1970 and 1986 and between 1994 and 1998. It takes the value 1 between 1987 and 1993 and between 1999 and 2001.
D1	Liberalisation dummy: 0 before liberalisation and 1 after.
DPOL	Dummy variable designed to capture political instability in the economy. It takes the value 1 between 1970 and 1979 and between 1984 and 1998. It further takes the value 0 between 1980 and 2001.

Table 2: Sign and Interpretations of Parameters of the Model

Parameters	**Description**	**Expected sign**	**Interpretation**
α_0	Measures efficiency	>0	
β_0	Captures shift in efficiency	>0	There may be positive changes
	over time	<0	There may be negative changes
		=0	There may be no changes
$\alpha_0 + ß_0$	-	=0	Liberalisation has no shift effect
$\alpha_0 + ß_0$	-	>0	Liberalisation has positive shift effect
$\alpha_0 + ß_0$	-	<0	Liberalisation has negative shift effect
α_i	Export elasticity w.r.t. the variables	>1	Export function elastic
		<1	Export function inelastic
τ_i	Shift in slope w.r.t. the explanatory	<0	There may be negative changes
	variables to capture structural	>0	There may be positive changes
	changes	=0	There may be no changes
$\alpha_i + \tau_i$	-	=0	The variables have no post-liberalisation effect on export
$\alpha_i + \tau_i$	-	>0	The variables have positive post-liberalisation effect on export
$\alpha_i + \tau_i$	-	<0	The variables have negative post-liberalisation effect on export

The Ordinary Least Squares Estimates

The results of the OLS estimation have been as shown in Table 3. From the table, it is apparent that the results are alluring. There is the indication of a "good fit" given by a high R^2 and adjusted R^2, low standard errors and high F-statistics. Though not all the coefficients passed the standard statistical significance tests, one could be tempted to accept the overall result thereby concluding that a close relationship exists between the series (when in the real sense, they are actually casually related). To overcome the spurious nature of most OLS estimation, a general to specific cointegration technique has been further adopted. "Thus, the process of cointegration technique establishes the relations between the model series by overcoming the problem of spurious correlation" (Komolafe 1996 1996: 312). The result of the latter has been found to be more robust.

Table 3: Ordinary Least Squares Results

Regressor	STATIC		DYNAMIC	
	LnX	LnNX	LnX(-1)	LnNX(-1)
Intercept	-22·1212 (-1·0510)	19·4116 (1·0203)	-18·9018 (-0·9015)	-2·1826 (-0·1228)
D1	8·1798 (0·2872)	8·2309 (0·3197)	41·3109 (1·3113)	43·5359*** (1·7959)
LnY	1·5903 (1·5695)	0· 4735 (0·5169)	1·3568 (1·2998)	1·4300 (1·6332)
LnOP	-0·6357 (-0·9279)	0·2889 (0·4666)	-0·5324 (-0·8135)	-0·5746 (-0·9825)
LnEE	0·6016 (0·2485)	-4·0737*** (-1·8615)	0·5746 (0·2578)	-3·1932 (-1·7097)
LnM	0·7675* (5·5977)	0·1902 (1·5349)	0· 3034 (1·3522)	0·1854*** (1·7624)
DULnY	1·1828 (·5276)	-2·4832 (-1·2253)	-1·6395 (-0·6672)	-4·7010** (-2·5624)
DULnM	-0·7382*** (-1·882)	-2·4832 (0·9163)	-0·6341*** (-1·7725)	0·2475 (0·8284)
DULnEE	-1·0152 (-0·4122)	3·7775 (1·6968)	-1·1153 (-0·4920)	2·9930 (1·5786)
DULnOP	1·6419*** (1·8574)	0·0174 (0·0218)	2·0307** (2·3729)	1·0880 (1·4535)
DMAC	-0·4943 (-1·1712)	-0·3222 (-0·8447)	-0·4918 (-1·2863)	-0·3616 (-1·1284)
DPOL	0·0685 (0·2858)	0·2428 (1·1209)	0·0861 (0·3949)	0·1339 (0·7238)
Depend. Var. (-1)	-	-	0·4733** (2·4456)	0·3325** (2·5754)
	2·3781	1·7436	2·3162	1·7498
D-W Statistic	1·6477	1·8108		
Durbin-H Stat.			None	-3·6955
R^2	0·9898	0·9845	0·9918	0·9899
AdjR^2	0·9843	0·9760	0·9864	0·9832
SER	0·2987	0·2700	0·2706	0·2266
F-Statistics	176·8554	115·7407	181·7208	147·6476

*** significance at 10%

** significance at 5%

* significance at 1%

Model Estimation Using Cointegration Technique

It has been established that, very often, time series data are non-stationary. In such cases, the residuals of these time-series regressions are correlated with their own lagged values, thereby violating one of the standard Ordinary Least Squares (OLS) assumptions. Thus, OLS estimates of these regressions are known to be biased and inconsistent and the standard errors are generally underestimated. Hence, the use of OLS technique will no longer be compatible with Gauss-Markov theorem (Wonnacott and Wonnacott 1979).

We suspect that the above may be the case in the present study and the probability of spurious regressions (Granger and Newbold 1974) using OLS technique is thus high. Hypothesising a full effect of trade liberalisation in the long run, we have adopted the cointegration and error correction model (ECM) to estimate the parameters of our model.

We observe, like Komolafe (1996), that in spite of some flaws, the ECM presents some attractions.

(a) Time-Series Properties: We begin by diagnosing the time-series properties of the variables employed in the model. In this respect, the Dickey Fuller and Augmented Dickey-Fuller tests statistics for the order of integration of the variables were used. Table 4 summarises the results of these tests. Thus, given that the absolute values for DF and ADF tests statistics are all lower than tabulated t-statistic at 5 per cent level, we conclude that the variables are random walks (i.e. non-stationary) indicating that the variables are I(1) series.

Testing the first-difference properties of these series, the DF and ADF tests statistics produce values that are significantly greater than the t-statistic at 5 per cent level of significance. Thus, differencing once produces stationarity for our variables, i.e., they are I (1) and, however, we observed that the results for ADF test statistics with the trend seemed contradictory with those of DF test statistics for three variables, namely, LnY, LnM and LnNX. On these, second differencing was carried out.

We noted that variables of different orders could not be cointegrated (Granger 1981). However, the above result on LnY and LnM appears non-severe since it is only in the case of ADF test statistic with trend that they are I(2) variables. Thus, we can conclude that the LnY and LnM variables reveal the weakness of unit roots test as it cannot discriminate between true and near true random walks. (Coughlin and Koedijk 1990).

We performed further analysis to test if the variables in the model are cointegrated. The result is shown in Table 5. From this table, we conclude that there is cointegration among the time series. Thus, even if we establish random walk (i.e., unit root) for them in the short run, the results above suggest that they are

Table 4: Unit Root Test

Variables	Dickey-Fuller Test		Augmented Dickey-Fuller Test	
	Without Trend	With Trend	Without Trend	With Trend
LnX	-0·27618	-1·9808	-0·12305	-1·7489
LnY	-0·75193	-1·3363	-0·77562	-1·4231
LnM	-0·16059	-1·8035	-0·08759	-1·5954
LnEE	0·95696	-1·8034	1·0504	-1·6584
LnOPN	-2·2125	-2·8539	-1·6222	-2·1034
LnNX	-0·13919	-1·9659	-0·09161	-1·9026
Δ LnX	-5·9902	-5·8822	-4·5526	-4·4810
Δ LnY	-5·1390	-5·0819	-3·3573	-3·3018
Δ LnM	-5·9907	-5·8819	-3·4255	-3·3578
Δ LnEE	-5·2647	-5·8222	-3·7098	-4·5513
Δ LnOPN	-7·4498	-7·3150	-4·4432	-4·4810
Δ LnNX	-5·57116	-5·5057	-3·1164	-3·0486
Critical Values				
• Level 5 per cent	-2·9627	-3·5671	-2·9627	-3·5671
• First Difference 5 per cent	-2·9665	-3·5731	-2·9665	-3·531

cointegrated in the long run. From the preceding conclusions, we can carry out the estimation using cointegration and error-correction model (ECM) to estimate our model.

Table 5: Test for Cointegration Among the Variables

Dependent Variable : Residuals of LnX; Regressors : LnY, LnOPN, LnEE, LnM

Test Statistic	**Without trend**	**With trend**
Dickey-Fuller	-4·6275	-4·5055
Augmented Dickey-Fuller	-4·7076	-4·5774
Critical value at the level of 5 per cent	-2·9627	-3·5671

(b) Cointegration Regression and Error-Correction Representation: In this subsection, we present the results and their interpretation. Both static and dynamic regressions were carried out as shown in Table 6. The table reports the long-run static cointegration regression and the possible ECMs. Table 7, which is computed from Table 6, presents the measure of magnitude and direction of shifts.

From Table 6, we observe that all the statistics conform to expectations: AdjR^2 , F-Statistic, the standard error of regression and the diagnostic tests, notably the LM Ramsey's RESET, Normality and Heteroscedasticity. The coefficient of

ECM_{-1} is everywhere statistically significant at 1 per cent level and they have correct and expected signs. Given the inclusion of ECM being used, we are sure that we do not have the problem of spurious regression. Therefore, we can conclude that the estimates of the parameters respond to Gauss-Markov theorem.

Consider equations I and II: the static case. The intercept and the dummy variable (D1) to capture shift in intercept are not significant in equation I whereas in equation II they are significant at 5 per cent level. That the constant term is found to be insignificant is due to the fact that the long-run cointegration regression incorporates the constant term. However, the result means that shift in intercept in non-oil export is more pronounced than in total exports. In the dynamic case (equations III and IV), the conclusions are similar.

The GDP which measures overall economic activities is observed to have no effect on total export as well as non-oil export since the coefficients are not statistically significant. That export elasticity of GDP is less than the one that seems to be plausible in the Nigerian context. In the dynamic model, the coefficient of GDP in equation III is statistically significant at 5 per cent level. It shows that export supply is GDP inelastic. In equation IV, the coefficient of GDP is not statistically significant.

The degree of openness, OPN, measured by the share of trade in GDP, is observed to be statistically significant at 1 per cent level in equation I. In equation III (dynamic model), the coefficient is also statistically significant at 1 per cent level. Both signs are positive. This shows that trade liberalisation through openness has a positive and significant effect on total export in both static and dynamic specifications. The non-oil export estimates show that the coefficients are not statistically significant. This means trade liberalisation policies through openness only has plausible consequences on total export and not on non-oil export.

In this study, we have used exchange rate, measured as the nominal effective exchange rate of the naira as a proxy to the terms of trade. The theoretical expectation is that depreciation of a currency should encourage exports and discourage imports. In both static and dynamic forms of the models, the role of exchange rate (EE) seems compatible with theoretical underpinning going by the signs except in equation III. However, nowhere is the coefficient statistically significant. This implies that the exchange rate, though statistically not discernible within this model, is an important factor in the explanation of export behaviour.

The inclusion of import in the model is to explain its contribution to production of exportable goods and services in the economy. Except in equation I, the signs are correct but all the coefficients are statistically non-significant. The implication is that the import considered as a factor in the production process has no influence on exports, both total and non-oil. One explanation may be found in the fact that greater proportion of our imports is non-capital consumer goods and hence the results.

The qualitative variables have been included in our model to capture the effects of macro-economic policy inconsistency and political instability on exports following trade liberalisation. From our results, we can infer an inverse relation between export and DMAC. The negative signs of the coefficient of the variable indicate this. Though the coefficients are statistically non-significant, they tend to indicate that macro-economic policy instability, during the period of estimation, have negative effects of exports.

In the case of the dummy variable to capture political instability DPOL, the results indicate that political situation has a positive effect on exports, both total and non-oil. They are, however, non-significant in equations I and III. This confirms our theoretical expectation that stable political environment is an enabler for export growth.

Four independent variables have been considered in the study which we now characterise as liberalising factors in determining how effective trade liberalisation has been on export taking into consideration the liberalisation date. Thus, in Table 7, if ψ is positive and has (*) sign, then we have a pro-liberalising factor. If ψ is negative and has (*) sign, then we talk of anti-liberalising factor. And when ψ is either positive or negative but without (*) sign, then we say that the variable is liberalisation neutral.

Thus, GDP has a pro-liberalising effect leading to higher export in both static and dynamic export models. But it has an anti-liberalising effect in the non-oil export supply. This again explains the mono-cultural nature of the Nigerian economy depending almost entirely on oil exports with a decreasing importance of non-oil exports. The latter are essentially agricultural exports and manufacturing. Therefore, the set of current policy mix to gear up exports of the non-oil leaves much to be desired. So far, all manners of incentives put in place have not brought about the desired positive change over time.

Similarly, the degree of openness has a pro-liberalising effect in both static and dynamic specifications for the export model and is liberalisation neutral for non-oil export in both equations. Again, this implies that it is the increase in the oil export as component of the export variable that explains the significant shift in export caused by the degree of openness. Here again, the policy mix designed to make the export sector freer in line with the prescriptions of the classical trade theories seems far from targets.

In the case of exchange rate, the signs are negative everywhere, of low magnitude and they are non-significant. This implies that exchange rate, following his model, is liberalisation neutral. This is not surprising given the observed constraints in the Nigerian economy. In effect, the Marshall-Lerner condition is not satisfied, as shown by Alege (1995). Thus, devaluation of the national currency will not bring about an improvement in the export of domestically produced goods.

Table 6: Cointegration and Error-Correction Representation For Export Supply Model

Regressor	STATIC		DYNAMIC	
	ΔLnX (I)	**ΔLnNX(II)**	**ΔLnX(III)**	**ΔLnNX(IV)**
Intercept	0 ·0377	-0·3020**	0·0212	-0·3011**
	(0·3291)	(-2·3346)	(0·2021)	(-2·2362)
D1	4·0472	57·0031**	7·8844	56·6266**
	(0·1921)	(2·4170)	(-0·3930)	(2·2298)
ΔLnY	0·5808	0·2469	0·8271**	0·1292
	(1·5663)	(0·5838)	(2·3084)	(0·2724)
ΔLnOPN	1·3918*	0·4738	1·3208*	0·4937
	(3·2366)	(0·9321)	(3·3523)	(0·9341)
ΔLnEE	0·0718	0·0376	-0·0828	0·0239
	(0·3780)	(0·1956)	(-0·4393)	(0·0981)
ΔΔLnM	-0·0916	0·15678	0·1430	0·1341
	(-0·0679)	(1·0553)	(1·0140)	(0·8498)
DULnY	0·0989	-5·3735**	0·8584	-5·3430**
	(0·0525)	(-2·5769)	(0·4885)	(-2·3961)
DULnM	-0·2813	0·4022	-0·1501	0·3975
	(-0·9433)	(1·1902)	(-0·0542)	(1·1339)
DULnEE	-0·1986	-0·0845	-0·0115	-0·0939
	(-0·9408)	(-0·3531)	(-0·0542)	(-0·3688)
DULnOPN	0·2772	-0·0671	0·0137	-0·0794
	(0·4916)	(-0·1028)	(0·0258)	(-0·1168)
DMAC	-0·0753	-0·1440	-0·0336	-0·1383
	(-0.2326)	(-0·4005)	(-0·1133)	(-0·3704)
DPOL	0·1617	0·3677**	0·0951	0·3893**
	(1·1740)	(2·4123)	(0·7336)	(2·4228)
Depend. Var. (-1)	-	-	0·3185**	-0·0015
			(2·0977)	(-0·0099)
ECM_1	0·5698**	-0·7101*	-0·9000*	-0·7106*
	(-2·7692)	(-4·2782)	(-3·6725)	(-4·1570)
σ	0·46166	0·44462	0·46166	0·44515
DW	1·62900	2·64490	-	-
Durbin-H	-	-	0·15330	-
R^2	0·87036	0·82546	0·89832	0·82893
$AdjR^2$	0·77885	0·70225	0·81571	0·68066

Contd.....

SER	0·21710	0·24261	0·19819	0·25156
F-Statistics	9·51080	6·69980	10·8738	5·59080
LM X^2 (1)	1·61580	6·78720	0·03003	6·34370
RESET X^2 (1)	0·52610	0·08228	0·16849	0·18073
Normality X^2 (2)	0·87835	0·48459	0·80906	0·40239
Heterosced. X^1 (1)	0·12615	1·20840	0·61902	1·06050

t***	1·725
t**	2·086
t*	2·845

Notes

1 Calculated t-ratios are in the parentheses

2 Routine F-Statistic test shows that the regressors are relevant in explaining the dependent variable if the value is greater than 4·43 at 1 per cent level.

3 Lagrangian Multiplier (LM) test of first order serial correlation at 5 per cent level of significance is 3·84.

4 Ramsey's RESET test, using the squares of fitted values, for functional form at 5 per cent level of significance is 3.84

5 Normality test of skewness and kurtosis of residuals at 5 per cent level of significance is 5.99

6 Heteroscedasticity based on the regression of squared residuals on squared fitted values is 3.84

7 t***, t** and t* imply critical values of t-statistic at 10 per cent, 5 per cent and 1 per cent levels of significance respectively.

Table 7: Measures of Magnitude and Direction of Shifts

S/N0.	Sources of shift	I	II	III	IV
		ΔLnX	**ΔLnNX**	**ΔLnX(-1)**	**ΔLnNX(-1)**
1.	Intercept	+4.08	+57.30*	-7.86	+56.32*
2.	ΔLnY	+0.68*	-5.12*	+1.69	-5.21*
3.	ΔLnOPN	+1.67*	+0.40	+1.33*	+0.41
4.	ΔLnEE	-0.12	-0.04	-0.09	-0.07
5.	ΔLnM	-0.29	+0.56	-0.01	+0.53

Notes:

- (*) Either the variable and/or its dummy is significant at any level of the test
- $\psi_o = \alpha_o + \beta_o$ o : indicates direction of change in intercept
- $\psi_i = \alpha_i + t_i$ o : indicates magnitude of post-liberalisation effects on exports
- Calculations are from Tables 4 and 5

The inclusion of import as an explanatory variable is to capture the effect of imports as a factor of production. In effect, import liberalisation through reduction in tariff rates, gradual removal of non-tariff barriers (NTB), outright banning of certain goods were to ensure that our imports, following trade liberalisation, should be mainly in intermediate and capital goods. It is argued that imports of consumables would be brought to nil and, therefore, there would be a corresponding increase in the production of competitive import. Consequently, a higher component of intermediate and capital goods in total import would bring about an improvement in the production of tradable goods, which, in turn, can provoke increase in exports. However, our results appear to be far from expectations. Import as an explanatory variable is thus seemingly liberalisation neutral.

Table 7 also indicates that there was no shift in the intercept, i.e., efficiency parameter remains unchanged after trade liberalisation for total export equations. In the non-oil export, the reverse is the case. Though the values appear over-estimated, they tend to show a positive shift in intercept for the non-oil export equations. We then can conclude that there were improvements in efficiency parameters, which were likely to be caused by exogenous factors to the non-oil exports.

Conclusions

In this paper, we have examined the effectiveness of trade liberalisation on exports. We introduced dummy variables in our model building in order to test if there was discernible change in export since the trade liberalisation date.

What flows from the study is as follows:

1. GDP and openness are pro-liberalising in total export, on the one hand. On the other, GDP is anti-liberalising and openness is neutral. This means that trade liberalisation has not achieved the desired effect in improving export of non-oil. The positive shift in total export may be due to oil export.
2. Depreciation of the naira exchange value has not provided the impetus for higher non-oil export and this is contrary to prescriptions.
3. Import does not explain supply of exportables which tends to indicate that Nigerian imports remain in consumables in spite of import liberalisation policies.
4. We observe from the results that there seem to be shifts in the efficiency parameter which is an indication that trade liberalisation policies have positive effects on export trade in Nigeria.
5. Policy inconsistencies have negative effect on export.
6. Political instability is anti-export drive.

The policy implications we can draw from this analysis is that the government should focus attention more on tangible factors; intangible factors (policies) in themselves are not sufficient.

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Participatory Forest Management in Andhra Pradesh: A Review of Its Working

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Abstract

This paper traces the emergence of Participatory Forest Management (PFM) regime in Andhra Pradesh in the form of Joint Forest Management (JFM) and Community Forest Management (CFM). The paper is based on the existing literature on forest policies. It considers the role of contemporary developments in India in shaping the forest policies in Andhra Pradesh. It also examines the process and quality of implementation and the impact of the programme on local communities and resources in Andhra Pradesh. JFM is a different concept from many earlier attempts to promote forestry needs of the people, simply because it builds from the roles played by both local forest users and the professionals employed by the state to act as custodians. The combined effort of community and government is the ultimate solution under prevailing circumstances. Therefore, the government intervention is expected to address the equity and transparency aspects to strengthen

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the voice of the poor. In the same way, participation of the people will warrant a constant vigil against all odds to protect the forests. Hence, Vana Samrakshana Samithis (VSSs) should be viewed as an entity for an overall development of the village resources and its people, and not merely an instrument of developing the degraded forests, more so with the new initiative of graduation from JFM to CFM focusing on alleviating rural poverty.

Introduction

Although India had a long history of forest policy, the livelihoods of forest-dwellers and forest-dependents had not been recognised until recently in policy. The reservation of forests by the Forest Departments (FDs) has been part of the long-term historical process of indigenous tribal communities being pushed deeper into the forests by the appropriation of tribal lands by non-tribals (despite some laws being enacted to prevent this). The state has appropriated large areas of Schedule V (tribal majority) area lands as state forests, without recognising the customary rights, particularly of shifting cultivators.

The forest policies led to the appropriation of extensive areas of tribal land with the objective of increasing and maintaining 'forest cover', and imposed restrictions on their use. The official claim has been that the tribals are responsible for forest degradation but this is highly contested both by the tribals and by sociological-historical-anthropological studies. A strong relationship has been observed between tenurial and livelihood security and environmental sustainability, which contrasts with the results of the FD views of 'managing' people for conservation objectives without taking their livelihoods or tenure into account. There have been several tribal revolts against these processes of tribal ancestral lands being appropriated by the FD in many parts of the country; for example, the Rampa rebellion in Godavari district (1922-24) and the Gond Revolt in Adilabad (1940) (Rao and Rao 1982; Arnold 1982).

The colonial government asserted control over extensive forestlands, resulting in the decline in traditional conservation and management systems around the forests (Gadgil and Guha 1992). After Independence, the early post-colonial forest policy differed little from the colonial period. The National Forest Policy 1952 did not consider the needs of the local people, its aim being supplying timber for industrial needs. Commercialisation of forests was emphasised, like the colonial regime, at the cost of the local people. The post-colonial government, in the Forest Policy of 1952, continued to envisage the commercial exploitation of forests, now for the 'national' rather than 'colonial' interest. Recognition of the importance of forests at the policy level is reflected in the Constitution which states: 'The State shall endeavour to protect and improve the environment and to safeguard the

forests and wildlife of the country'. Constitutionally, it has been enjoined upon every citizen of India, as a fundamental duty, 'to protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures' (Kashyap (1990)).

Under the 1967 AP Forest Act, not many forest areas were settled because most forest settlements were already in place before 1940s in Andhra and Rayalaseema areas. In Telangana region, forests were settled under 1945 Hyderabad Forest Act. However, as far as Andhra Pradesh forest management is concerned, this Act provides the legal and administrative framework. Subsequently, several sub-rules were formulated to strengthen the 1967 AP Forest Act, like Forest Offence Rules in 1969, AP Forest Produce Transit Rules in 1970, Minor Forest Produce (MFP) Regulation of Trade Act in 1971, and the AP Scheduled Areas MFP Regulation of Trade Act enacted in 1979.

Prior to 1988, the forest policies focused mainly on the productive and profit-making aspects with a focus on timber for industrial requirements. Moreover, they had restricted the local communities from using the forests (GoI 1952). This effectively represented heavy subsidies flowing towards industry, and the alienation of forest dwellers and dependents adversely affecting their livelihoods. These policies had not considered the needs of forest-dwellers and users as legitimate. This kind of approach led to several conflicts. This also led to a reorientation from the commercial-oriented forest policy to a more 'people-oriented forest policy' leading to the introduction of Joint Forest Management (JFM).

The new Forest Policy of 1988 is considered a watershed in the history of forest policy. The salient features of the new policy were preservation and restoration of ecological balance, conservation of the natural heritage of the country by preserving the remaining natural forests, protecting the vast genetic resources for the benefit of posterity, fulfilling the basic requirements of the rural and tribal people residing near forests and maintenance of the intrinsic relationship between forests and the tribal and other poor people living in and around forests by protecting their customary rights and concessions on the forests. Despite the broader objective at the national level, the interpretation and implementation of the policy varies widely across states. While some states have adopted the policy in a formal way of creating the needed institutions like VSS, some have interpreted the policy in a broader way. But few have implemented the policy in its true spirit. Andhra Pradesh (AP) is one of the states where the policy was viewed in a broader perspective in terms of benefit sharing. In fact, AP converted the Joint Forest Management into Community Forest Management (CFM) to reflect the broader perspective. This paper traces the emergence of the new Participatory Forest Management regime of JFM and CFM in AP. Based on the existing literature, the paper examines the process, quality of implementation and the impact of the programme on local communities and resources.

This paper is organised in six sections. The following section (two) analyses the trends in forest resources in AP. Section three reviews the forest polices in AP in a historic perspective with a focus on recent policies. The fourth section reviews the impact of JFM while the fifth section presents the advent of CFM in AP along with a comparison between JFM and CFM and the last section makes some concluding observations.

Trends in Forest Resources in Andhra Pradesh

AP had 5.66 million hectares (mha) of forest in 1955-56 which had increased to 6.19 mha in 2001-02 (Economic Survey 2002-03). The total recorded forest area now is 6.38 mha. Forests are concentrated in Adilabad, East Godavari, Khammam, Mehboobnagar, Prakasam, Srikakulam, Visakhapatnam, Warangal and West Godavari districts. About 19 per cent of the villages (5,051) out of total 26,586 in the state, accounting for 10.67 million population, have 'forest' as land use covering 2.57 mha. Based on satellite data (November 1998 to January 1999), forests accounted for 4.42 mha (16 per cent) of the geographic area, of which 24,190 sq.km were dense forest, 19,642 sq.km were open forest and 397 sq.km were mangroves.

During the post-Independence period, the Forest Department re-allocated the forest land for other uses. For instance, between 1950 and 1980, 2.07 lakh hectares of forestland were lost towards rehabilitation and agricultural purposes. However, much of this loss has not been reflected in the official forest statistics. According to the official estimates, the total 'loss' of forestland had increased to 2.36 lakh hectares by 1991-92 (Table 1), and about 29,000 hectares of 'encroached' forestland had been regularised by 1994. The area 'lost' due to encroachments has remained constant because only legalised encroachments are recorded here, while the illegal encroachments far exceed the legalised encroachments. Agriculture accounts for the largest share in the forest loss. The area lost due to rehabilitation activities during the period accounts for the second largest component.

Table 1: Loss of Forests in AP (in hectares)

Purpose	Up to 1983-84 (ha)	Per cent to total area lost	Up to 1991-92 (ha)	Per cent to total area lost
Rehabilitation	66,759	32.18	66,759	28.30
Agriculture	87,289	42.07	104,902	44.47
Non-agriculture	18,816	9.07	19,154	8.12
Singareni colonies	5,461	2.63	15,907	6.72
Encroachments	29,160	14.05	29,160	12.36
Total	**207,485**	**100.00**	**235,889**	**100.00**

Source: GoAP Facts and Figures 1999.

The Andra Pradesh Forest Department initiated several measures to extend forest resources during the 1970s and 80s. Afforestation was attempted with the launch of the Social Forestry (SF) scheme aided by the Canadian International Development Agency (CIDA), under which an area of 1,36,885 ha was planted during 1983-90. Additionally, plantations were taken up along the riverbanks to prevent sand drift, along coastal areas as a windbreak and also for fuel wood and fodder purposes. A total of 2.5 mha area is reported to have been brought under plantation since 1951.

Along with the loss of forests, the quality of the forest (forest cover) has declined in different regions of Andhra Pradesh. According to the National Remote Sensing Agency (NRSA), about 38 per cent of the forest area in AP was degraded in 1988-89 (Reddy *et al* 2001). The extent of degradation was very high in AP when compared to the national level (24 per cent). Forest degradation is not uniform across districts of the State. The nature and extent of degradation has reflected on the revenue generation of the forests (Reddy *et al* 2001). The degradation of forests was mainly due to the ineffectiveness of the FD or non-cooperation of the people in the protection of the forest.

Emergence of Participatory Forest Policies in AP

Even before the introduction of JFM in India, community-based forest management was practised in different parts of AP on a small-scale. For example, in Karimnagar district, this system existed since 1982-83 (Venkati 1997). The Government of AP had introduced people's participation in forest management in 1983 by leasing out the degraded forestlands on '*tree patta*' to the weaker sections for raising fuel wood plantation with a view to improving the performance under SF programme with CIDA assistance. Many people could not access these entitlements as the Forest Conservation Act 1980 did not permit leasing out forestland to private individuals, authorities or agencies without the approval of the Central Government. As a way out, the scheme was modified into 'Reforestation of Degraded Forests with Family Assistance Scheme' but when this scheme was referred to the Central Government for approval, it was rejected. The Central Government said that the scheme could not be allowed on forestlands. Thus the efforts of the poor to seek livelihoods received a setback (Gopal and Upadhyaay 2001).

Spread and Implementation of JFM

JFM was initiated in AP in 1992; later, several modifications were introduced to incorporate pro-people measures. Under the JFM, *Vana Samrakshana Samithis* (VSSs) were formed to protect the forest resources. However, the growth in the number of VSSs was very slow till 1995-96. But, later, from a mere 133 VSSs during 1994-95, it went up to 6,726 VSSs in 2001-02 managing 16.89 lakh hectares of forest area, of which about 7.85 lakh ha of degraded forests had been treated. Around 13

lakh people, including 6 lakh women are involved. By 2004, the official number of VSSs stood at 7,245 managing 1,886,764 ha, (or over 29 per cent of the state forest land) and involving 611,095 families (Bahuguna, *et al* 2004). Most VSSs are concentrated in Adilabad, Visakhapatnam, Khammam districts, and in districts with high forest cover and also where *podu* has been a major problem. Availability and pooling of funds explains the sudden increase in the number of VSSs during the late 1990s. JFM has been implemented through a number of different funding schemes. While the AP Forestry Project of the WB was the major contributor (2,910 VSSs), other programmes like EAS (1,956 VSSs), NABARD (918 VSSs), Centrally-sponsored schemes (411 VSSs), had a substantial share in the VSSs etc. The AP Forestry Project was implemented for six years from 1994 to 2000 at an overall project cost of US $ 89.10 million (Rs.3,536.5 million) of which the bulk consisted of loan (Sunder *et al*, 2001).

The AP Forest Policy 1993 encouraged the participation of local village communities in forest management through JFM, by organising them into VSSs. AP's benefit sharing policy is apparently the most liberal of all the states in India. VSSs are entitled to full harvest of timber and bamboo from natural forests vested with them in addition to Non-Timber Forest Produce (NTFP) and yield in proportion to the period of management by them in respect of timber from plantations. The VSS is entitled to all non-nationalised NTFP. Although *de jure* only three items (i.e., *sal* seeds, bamboo and *Tendu* leaf) are specified as 'nationalised', the villagers have only collecting rights in their area over the nationalised ones and have to sell to the Girijan Cooperative Corporation (GCC) at its fixed-rates despite the fact that Panchayat Extension Act to Scheduled Areas (PESA) endows *gram sabhas* in Schedule V areas with the ownership of all Minor Forest Produce. There are a number of committees related to JFM operating at the state, district and village levels in AP.

The state-level committee is chaired by the Principal Secretary of Energy, Forests, Environment, Science and Technology (EFESandT). This committee is to meet quarterly to submit its report to the government and co-ordinate among various departments of the State government connected with the implementation of the JFM. The district collector chairs the District Forestry Committee. Apart from the heads of relevant departments, three NGOs active in the district and five representatives of VSS are members of the committee. The function of the committee is to ensure co-ordination among various departments of the government at the district level involved in the implementation of the JFM and refer matters to AP State Forestry Committee as and when necessary, apart from meeting quarterly to send its report to the PCCF and the government regularly. To co-ordinate and facilitate the implementation of the concept of JFM in the tribal areas, a sub-committee is formed with the project officer of the Integrated Tribal Development Authority (ITDA) as its Chairman, two NGOs to be nominated by project officer of ITDA, ten

members from VSS in the Agency area, again to be nominated by the project officer of ITDA as members, and Sub-DFO/DFO in ITDA headquarters as member/ convenor. This sub-committee is to address itself to the problems in carrying out the deliberations and the decisions of the AP State Forestry Committee and District Forestry Committee at the field level.

Persons from all households are eligible to become members, particularly those from the most disadvantaged sections of the society, the Scheduled Castes (SCs) and Scheduled Tribes (STs), in the village committee. Generally, two people from each household can become members, and one of them must be a woman. The General Body (GB) elects the Managing Committee (MC) of 10 to 15 members, 33 per cent of whom must be women, who, in turn, elect a chairperson to oversee and manage the affairs of the VSS. Elected representatives shall not be less than six members. And the maximum number of members is restricted to ten. The President of the gram panchayat is a member of the MC. Besides, the concerned forest guard, an officer nominated by the project officer of the ITDA, the local NGO actively involved in the formation of the VSS and the village development officer are also members of the MC. The concerned forester / deputy range officer is the member-secretary of this committee. The forester and the forest guard shall not have voting rights. The chairperson's term is co-terminus with MC, i.e., two years. In the ITDA areas all the elected members should be tribals. In the case of the non-tribal areas, at least one-third of the membership is reserved for SCs and STs. Non-elected members have no voting rights. On similar lines, an eco-development committee will be constituted with an elected managing committee. A GB meeting of the VSS shall be held once in every six months to review the action taken regarding the JFM plan and review the performance of the MC. The MC shall meet at least once in a month. The MC prepares the JFM micro-plan in coordination with the Forest Range Officer (FRO) and in consultation with all sections, particularly, women and other disadvantaged sections of the community. JFM micro-plan should be approved in the General Body (GB) of the VSS. The works and funds of the VSS are handled jointly by the chairperson of the VSS and the forester who acts as the secretary (Venkatraman and Falconer 1998).

The NGOs play a crucial role in the implementation of PFM in AP. NGOs are involved as facilitators to promote the formation of VSSs and eco-development committees. Their responsibilities include bringing awareness, motivation, help in preparing micro-plans, help in conducting training of local communities for capacity-building, leadership skills, gender sensitisation, etc. NGO's help is sought in imparting skill to communities in bookkeeping and accounts maintenance, etc. Besides, the NGOs also influence the policy direction. The AP NGO network constantly pursued the government and the World Bank in getting the resettlement and rehabilitation package sanctioned especially for *podu* victims. However, there is a deliberate attempt by the government to reduce the role of NGOs in the CFM

programme. The policy undertaken in 2004 by the AP government drastically reduced the role of NGOs in VSS management. Now, all financial assistance given to the NGOs has ceased. In the place of NGOs, Community Extension Workers have been appointed to supervise and guide the VSS committees.

Impact of JFM in AP

We rely on studies and reports for documenting the impact of JFM in AP. These indicate a range of benefits from the programme, the most obvious being improvement in forest conditions. Additional benefits have apparently been to local people's livelihoods, and the distribution of equitable benefits from the programmes.

Positive impacts

Evidence suggests that the swift expansion of JFM in AP has led to regeneration of forests and the resulting economic gains to the local people. Additional benefits have been the reduction of forestland conversion for agriculture, reduction of illicit timber felling, and improved safety for the forestry staff. However, many of the reports have been presented either by donor-project staff or by foresters themselves, and so are not entirely objective. The discussion of a number of different case studies here is illustrative of the sort of benefits possible, rather than attempting a conclusive weighing up of positives and negatives.

Behroonguda VSS in Adilabad, where JFM was launched on May 23, 1993, became the first VSS to gain official recognition. The 'village committee' comprised 50 per cent women members in a 97-member body, headed by a woman member. In 1998, Behroonguda also became the first VSS to reap the fruits of forest protection. It generated an income of Rs 0.36 million from the sale of teak poles, the first round of thinning in an eighty-year teak management rotation. A number of NTFP also re-emerged due to better protection by the VSS. From the point of employment, the labourers were kept busy in 'coppicing shoots' for which they were paid Rs 40-50 per day, a better deal than agricultural wage. At the same time, out-migration was reduced. In terms of income, the VSS families earned Rs 1,000 per year each apart from the 'usufruct benefits' (D'Silva and Nagnath 2002).

Resource Improvement

The primary aim of JFM has been improved forest condition through improved protection. Evidence, both statistical and field case studies, seems to bear this out. The Forest Survey of India has been collecting forest cover data, and comparing their data over the years shows a slight improvement in forest cover in AP, apparently a change from scrub areas. Furthermore, a number of case studies bear out the claim that 'better protection of forests has been the greatest achievement of JFM' (Mukherjee 2004). The VSS in Hottebetta, a hamlet in Rolla Panchayat in

Anantapur district, came into existence on 1996, with an initial focus on the development of grasslands. Subsequently, in 1996-1997, fodder development was taken up in 30 ha of land. In the same year, 5 rock-fill dams, 3 check dams were constructed and 20,000 saplings were planted afresh, which had gone up to 61,540 by the year 1998. Further, the VSS resolved to develop 20 ha into 'horticultural land' with an intention of serving it as a source of independent income for sustaining the people's action. This scheme also met with significant progress6. The VSS also undertook 'pasture development and community hall building' (Muralidharudu *et al* 1997).

The satellite data used to gauge the forest cover in the districts of Adilabad, Nizamabad, Kurnool, Khammam, Visakhapatnam and Warangal during the years 1996 to 1998, revealed that not only the forest area under VSSs had improved but also the adjoining forests for which the entry was through the VSS areas. The dense cover had also improved in the JFM area compared to non-JFM areas and the degradation process had also stopped (Rangachari and Mukherjee 2000).

The data from 120 VSSs, accounting for 5 per cent of the total in the State formed before 1998, showed that except for Anantapur district, which is the driest in the State with heavy incidence of grazing, there was an overall improvement in 'growing stock' (i.e., timber trees). With regard to NTFP production, the decline before JFM for various reasons was thwarted after the introduction of JFM with the revival of people's interest in NTFP and plantation of NTFP species in most of the VSS areas such as tamarind, amla, seethaphal, etc. These species were also recommended for the better regeneration of forests and livelihoods by OM Consultants who evaluated the JFM in AP (OM Consultants 1998)[1]. Besides, some high yielding eucalyptus clones were raised on demonstration plots for people to see and understand the economics of growing plantations in place of cultivating forestland. Similarly, medicinal plants of certain identified species such as *aswagandha, senna, rabhi, pippalu,* etc., were being grown on an experimental basis with the help of the people. The regeneration and species diversity boosted overall forest bio-diversity. Other ecological benefits like increase in water table was very appreciable because the increase ranged from a minimum of 0.13 metres to a maximum of 13.92 metres contingently improving the agricultural yield to the extent of 51.7 per cent.

Naginayana Cheruvu, a remote area adjoining forests in the district of Anantapur, was able to protect the natural re-growth of plants in the forest land, from 10 to 15 per cent cover initially to 80 per cent cover. As a result, it was claimed that there was substantial increase in the groundwater levels. There was also steep increase in the wildlife population in the area. The developments in Naginayana Cheruvu indicate a positive surge in forest growth, thanks to taking the people into

confidence and without compromising on their basic needs (Biswas *et al* 1997). Reddy *et al* (2000) in their study of VSSs in the villages in Anantapur district have found 'natural regeneration of forests' in all but one *thanda* (hamlet), while the growth of plant species was relatively better than that of bushes and fodder. The reasons for such drastic change were control of fire, prevention of illegal felling of trees and prevention of cattle grazing. As a result, the way was paved for the recovery of wildlife population.

Employment, Income and Poverty

As regards income, JFM has helped improve the living conditions of the locals by generating additional income and reducing the dependence on moneylenders. The increase in economic status facilitated children's education, particularly girls, active involvement of women in VSSs, etc. The seasonal migration (except one *thanda*) was checked and the general health had improved and showed an encouraging signs towards following family planning policy by the people. Among the areas studied by Reddy *et al* (2000), two VSSs of Kannaram and Chandrayyapalem were able to generate good employment and income in view of the fact that in these areas the commercially important species like tamarind, soap-nut, honey, gum and *beedi* leaves were grown. Gopal and Upadhyay (2001) have reported on the formation of a VSS in 1995 in Sugali *thanda*, a tribal hamlet in Kadapa district. A PRA exercise was undertaken in 1996 and a micro plan was prepared to address the livelihood needs. Over a period of 4 years, it is claimed that the annual average family income rose from Rs 3,800 to Rs 4,700. The key factors for the success were identified as three years of continuous awareness and motivation, provision of identity cards to all the members, improved savings and increase of employment and income generating activities.

With the formation of a VSSs, in 1995 in Ippapenta, a hamlet consisting of 35 Harijan families in Kadapa district, they were able to persuade the neighbouring villagers to stop their illegal activities in the forest. They were successful in convincing the rich farmers not to collect firewood and timber from the forest patch allotted to the SC colony and to restrict their cattle from grazing in the protected patch. The efforts of the VSS bore fruits, as hundred hectares of forest had already been treated for rehabilitation. In 50 ha area, fruit-bearing trees, including mango, blackberry, cashew, etc., had been planted along with cleaning and singling operations. VSS members with technical and financial support from the FD constructed contour trenches, rock-filled dams, concrete check-dams, etc. Agave suckers were planted along the contour lines. Protection of the forest from grazing and control on firewood collection resulted in increased hill-brooms growth. During the year 1997-98, the VSS members earned Rs 9,975 from the sale of broomstick (Gopal and Upadhyay 2001).

Tribals outside the scheduled areas found that the JFM programme was a boon, since it provided valuable wage employment (Farrington and Bauman 2002). Borgoyary (2002) has found in her study of five selected VSSs in Visakhapatnam district that the JFM was successful in those villages where there was considerable alternative employment generation such as 'food for work'. Employment generation through the JFM programme was the main reason for poverty alleviation. For, the income from employment has an additional benefit over the existing income from NTFP. Even the benefits from improvement in the availability of NTFP might be marginal.

The factors that tend to make NTFP important in the livelihoods of the poor also limit the scope for NTFP to lift people out of poverty. Markets for many of these products are small (Sunderlin *et al* 2005). Naturally, products tend to be dispersed, with seasonal and annual fluctuations in quantity and quality of production. NTFP produced in open-access regimes is highly susceptible to overexploitation. Remote settings with poor market access put producers in a weak bargaining position relative to traders who typically provide transport, market connections, and credit to NTFP collectors in classic patron-client relationships. Also, the poor people often do not have formal and secure land tenure. This may limit their *de jure* ability to sign service-provision contracts. Moreover, restrictions on actual control over land, that is, the right and ability to exclude external intruders, may also *de facto* limit the poor people's prospects to be reliable service providers.

As Dove (1993) noted, in those cases where NTFP had a high value, the produce tended to be appropriated by people with more power, more assets, and better connections, that is, the non-poor. This has proved to be true in AP as well (Suryakumari 2001). In such milieu, decentralisation of authority and resource control, now occurring in many developing countries, increases though by no means generates the possibility of greater local access to forest rents. Presumably, in the best of cases, greater local access to forest rents can assist poverty alleviation. The employment opportunities from the JFM programme may not sustain in the long run in the absence of identifying productive and remunerative activities in the local areas. Moreover, the employment generation now is linked to external funding and unless the VSS becomes self-sufficient, the JFM is not sustainable in the long run. Further, if JFM is implemented in a sustainable manner, as demonstrated by several studies, it can contribute significantly to forest development and poverty alleviation in the future (Kumar *et al* 2000).

Community Development

Mallett (2000), citing the example of Adilabad district, illustrates how the people who were suspicious of JFM are now eager to participate, as the fruits of JFM could be seen in the district where 45 per cent of the forest was lost to agricultural encroachment between 1983 and 1993. Ever since JFM was launched this trend has

been reversed, and there have been no reports of forest loss in any area managed by the VSS. Not confining to mere forest activities, the development works like community halls, check dams, drinking water structures, roads, etc, were also taken up under JFM. The area where JFM policy least expected to bring any sort of positive results was that of countering the '*Naxalites*', but JFM came as a 'godsend'. According to the Forest Secretary and the PCCF, in Adilabad, one of the strongholds of the People's War Group, 'today the forester feels safe to visit the once *Naxalite*-infested localities because of the protection by VSS members' (Rangachari and Mukherji 2000).

According to Venkatraman and Falconer (1998) and Rangachari and Mukherji (2000), the degraded forests came back to life with the stoppage of timber smuggling, control over cattle grazing and virtual stoppage of encroachment. This was possible only due to effective participation and involvement of the local communities. Rangachari and Mukherji (2000) are of the opinion that bringing people and forest officials together in itself was a tremendous breakthrough given the hostile conditions between the two parties existing earlier in this region. The co-operation and trust is increasing with every passing day.

Gender Issues

Gopal and Upadhyay (2001) have observed that women in Maktha Masanpalli, located 75 km from Hyderabad, were quite active, which could be seen from the three women self-help groups, which were functioning effectively. SC colony women were not allowed to attend religious and marriage ceremonies until the formation of the VSS, when the women started participating actively in village welfare activities. Though women here had to walk more distance than before to collect fuel wood, now the forest guards do not stop them. The quarrying for sand and stone by neighbouring villages had also declined with the efforts of the VSS. Women participated in all VSS affairs as equal partners and were paid equal wages.

Subdued Impact

While the preceeding review highlights the positive aspects of JFM, the following narration brings out the other side of the story. JFM has had much more limited benefits as well as negative effects in many parts of the state due to different reasons, according to some studies:

Asymmetric Power Relations between VSS and FD

Although JFM claims to have 'joint' control over resources and decision-making, it is not 'joint', but rather the 'Department' maintains asymmetric power over the VSS. This is illustrated by many cases where the wishes of the VSS have been ignored. For instance, there have been cases of the VSS area being handed over for bauxite mining. There was even an attempt in the year 2000 to bring private industries (GO 112) into development of plantation on state forest lands, on the

pretext of 'fund crunch' (i.e., lack of funds). Under this plan, private companies like Reliance, Bhadrachalam Paper Mills, etc., were to invest in growing remunerative species in collaboration with the VSS in degraded forests with a revenue-sharing arrangement. The plan was to form a tripartite group of industry, VSS and government representatives to oversee the scheme. It was assured that the revenue from such an attempt to the VSS would be much higher than what they were earning then. The idea was seen as a design against the very interests of the 'tribal' in particular and the 'environment' in general. Under pressure from NGOs, human rights activists and opposition parties, the government eventually backtracked (Mahapatra 2000).

A further lacuna in the provision of the VSS is the asymmetrical power relationship between the FD and the villagers. Participation of the villagers in the planning process of JFM has, in practice, been ignored by the FD. The micro-plan is framed in the forest office; and rarely does it reach the villagers. People are rarely aware of the budgetary allocations and the budget plan for their village. Ideally, the VSS should be in possession of a copy of the budget plan but that rarely happens (Farrington and Bauman 2002). The second copy is with the ranger, which is never shown. Another aspect, which is adversely affecting the performance of JFM in some areas, is the supposed elections to executive committees after every two years, which in practice, are usually not conducted, leading to undemocratic practices by the 'elites'. A majority of the ordinary members are not aware of the funds being released to their VSS (Reddy *et al* 2000).

Poor Institutional Sustainability

The most positive feature of the JFM programme, as claimed by forest officials, is that in all the VSS areas, the JFM appears to be the most actively implemented government programme at the village level; no other department has built up this kind of community institutional structure. However, this claim is contradicted by a number of sources. From brief field visits it is quickly realised that many VSSs are, in fact, non-functional, and the ones that are functional face particular problems when the period of funding support ends. Commonly, their activities are also far reduced. Local people appreciate that they have been given legal endorsement to protect the local forests from felling by outsiders. However, beyond this, livelihood benefits such as employment have been dependent on inflows of funds, and when this stops, the motivation to be involved in VSS activities is reduced. Poffenberger and McGean (1996) in a recent study in Adilabad have found that women's Self-Help Groups (SHGs) were more dynamic and self-sustaining, whereas many of the VSSs had gone into hibernation at the end of phase I of the Bank project, in the absence of further funding.

Coordination

In tribal areas, the success of JFM requires the support of other departments working for tribal and rural development, but their response is lukewarm

and is not coordinated. In practice, the work, which the ITDA is used to do, has been transferred to the FD, supposedly for better coordination (CRY Net nd).

Corruption and Lack of Transparency regarding Funds

Funds are transferred to VSSs to finance their forest works and creation of employment. The system is not transparent, and irregularities in fund allocations are rampant: there are widespread anecdotal reports that the distribution of funds system allows the Forestry officials to embezzle funds in collusion with the VSS treasurers and committees. A set rate of 25 per cent of the total going back to the FD staff is even talked about openly in committees. There is even wastage of money on non-forestry activities like publicity material, to camouflage the real intent and purpose of JFM by the groups with vested interests.

D'Silva and Nagnath (2000) have pointed out that there is ambiguity and confusion at the grass-roots level over JFM funds, particularly with regard to 'final harvest' and the confusion over 'incremental benefits'. Benefit sharing arrangement of 100 per cent in the incremental value of the produce is further amended. Now, VSSs are entitled to the full harvest of timber and bamboo from natural forests vested with them, in addition to NTFP and yield in proportion to the period of management by them in respect of timber from plantations (communication from Mr. Kalaghatgi, PCF). Sunder *et al* (2001) have found that low wage and discrimination between men and women also discouraged the JFM activities. The wage rate was as low as Rs 20 and Rs 25 for women and men respectively, a very discouraging sign considering the prosperous condition in other parts of AP.

Forest Boundary Conflicts

Some studies have found the prevalence of disputes over forest boundaries. In many areas, the Department has not thought of maintaining the balance between population and extent of forest area, but has made arbitrary boundaries, sometimes trespassing into other villages. Artificial boundaries have taken over traditional village *'polimeru'* causing most of these problems. As a result, in many instances, the aggrieved villagers have cut down the entire plantation (e.g., R. K. Nagar VSS - Araku Mandal, Vizag District). This has been a particular problem in Paderu area, where tribals felt that the FD was trying to set one village against another, by giving rights to the benefits from one village's forest to a neighbouring one, on condition that they stop podu cultivation in the forest. Sunder *et al* (2001) have found that boundary disputes and NTFP conflicts were demoralising the people to give up joint management.

Tribal Development Vs. Forest Development

The 'encroachment' of forestlands is reported to have been stopped with no fresh cases of encroachments reported under VSS jurisdiction because of people's participation. The most significant development in many of the VSSs, especially in

the districts of Visakhapatnam and Adilabad, has been the return of about 24,000 hectares of land, which was under *podu* cultivation, to the FD (Rangachari and Mukherji 2000). Whilst this is viewed as a success by the FD, in fact, it indicates that land has been taken from tribals. This is the main reason why in the predominantly tribal Paderu division, tribals and their organisations (e.g., the *Adivasi Aikya Vedika*) have rejected CFM out of fear of losing more *podu* land.

According to SAKTI, a local NGO, the FD will not protect the rights of the tribal people who are part and parcel of the ecosystem. Instead, the JFM programme exploits the tribesmen in the name of forest and socio-economic development. The NGOs feel that recognition from the State FD will motivate the tribes to protect their forests efficiently and allows the community to benefit from other programmes. For instance, support from the Integrated Tribal Development Authority and other allied government agencies, would give special focus to those communities that are involved in JFM activities. In fact, JFM enabled the FD to take over even the ITDA's role in tribal areas (Rao *et al* 1995-96).

The proposed Scheduled Tribes (Reorganisation of Forest Rights) Bill is expected to legalise the customary rights of tribals on forest land (for details, see EPW, 2005). Every forest-dwelling tribal family is entitled to 2.5 acres of land. Further, tribal villages are brought under the revenue village. While it is too early to assess the impact of the Bill on PFM and the functioning of the VSSs, it is expected to reduce the pressure (dependence) on forests. Besides, access to customary rights to tribals would ensure that their relationship with the FD is on equal basis, rather than a patron-and-client relationship. To this extent, the Bill would facilitate better participation of tribal communities in the VSS activities.

Gender Inequity

Women are the predominant collectors of fodder, fuel wood and NTFP and are supposed to benefit considerably from JFM, but, are, in fact, neglected in most areas (Farrington and Bauman 2002). The role of women in JFM is found to be negligible in spite of their substantial membership in the VSS. As Sarin *et al* (1998) point out, even where the 'one man and one woman per household' rule was adopted for membership in the FPC (as in AP), a large number of disadvantaged women were excluded as formal membership meant little unless the women were empowered to participate in decision-making process on the basis of ready access to information and alternative management options. In several villages, women were unaware that they were members of a GB, let alone of the executive committee. Not only were women excluded from community decision-making bodies by tradition, but JFM rules, in the name of protection, gave further power to elite men to exclude poor forest dependent women from the forests. Hence, ensuring women's informed participation in the decision-making process had to be the essential first step towards equal participation of women in community forestry management

institutions (Kameshwari 2002). Empowerment of women in JFM had not ensued in different regions of the state. Sunder *et al* (2001) have found that women were playing very little role in the management of JFM in Paderu of the Eastern *Ghats* of AP. Suryakumari (2001) has found that women, in general, were unaware of the programme, though they participated in the meetings. Even worse, the women committee members themselves were unaware that they were in the management committees and the few who knew about it were unsure of their roles. In such circumstances, it became immaterial whether filling the stipulated 30 per cent quota in the management committee was carried out or not. On the wage front, they were discriminated against even when the nature of work was the same, since the decision on wage rates was the prerogative of the VSS, mostly dominated by men.

Leadership Issues

In the overall context of VSSs and benefits to the marginalised sections of the society, an interesting observation has been made by Suryakumari (2001) wherein she has found that the VSSs are helping SCs, STs and Backward Castes (BCs) in honing their leadership positions through reservations, especially in the Minor Forest Produce areas. But in VSS areas, where there was high value timber in the forest, the dominant communities took leading roles in the VSSs and excluded the marginalised, for instance, by prescribing high membership fees and proposing voluntary labour which the poor could not afford.

Livestock and Livelihoods

The recent grazing policy, drafted in the backdrop of the then Chief Minister's statement in the Assembly that 'goats are the enemy of environment and forests' on April 1, 2001, is seen as anti-poor and anti-livestock in general and anti-goat, in particular. Evaluations of AP JFM, carried out by OM Consultants, too have come up with drastic curtailment of goats' numbers (OM Consultants 1998). The reintroduction of indiscriminatory grazing fees for livestock (Rs 40 per goat per annum), prohibition of grazing on the interior protected forests, creation of 'paddocks' for grazing and delegation of 'permission authority' to the VSS chairmen in the VSS areas have given the impression that the government is acting hand in glove with the WB to benefit the local elites and multi-national companies (MNCs) from Australia and New Zealand to further their interests in the Indian meat market with their 'boneless meat'. Although levying fines is the discretionary power of the respective VSS and is not a "policy" of the government as such, holding goats and their herders solely responsible for the destruction and deforestation is implausible, since historically they have always been depending on forests for their survival and its conservation is their own survival (Ravinder 2003).

Local Governance: The Panchayat Extension Act to Scheduled Areas (PESA), 1996

Under the 73rd Constitutional Amendment Act, panchayats may now be empowered by state governments to decide on matters and functions specified in the Eleventh Schedule to the Constitution (although most of the states are yet to devolve the powers to the *panchayats*, including AP). This pertains directly to JFM, and throws up a fundamental contradiction. This amendment includes items relating to forests (land improvement, soil conservation, watershed development, social forestry, farm forestry, minor forest produce, fuel and fodder, etc.), although the management of state forestlands is not as yet included. Furthermore, extension of this Act to Schedule V areas has wider implications on forest resources in tribal areas (as specified in the Fifth Schedule). The *grama sabha* or the *panchayat* is endowed with the right of ownership of NTFP and granted to meet the bonafide requirements of the local community. The Act empowers the *grama sabha* of traditional communities to manage its community resources in accordance with its customs and traditions.

As far as Andhra Pradesh is concerned, one gets to see a lot of contradictions between the VSS and the *panchayat*. The matter is compounded further with ineffective co-ordination between the legal and administrative framework of these two institutions. The major reason for this is the overlapping of functions of the *panchayats* and the VSSs because both operate simultaneously at the village level paving the way for the incidences of inter-institutional conflicts. The supremacy for power, position, competition, management and control and disputes over benefit sharing are the reasons for conflicts which surface more often. This state of affairs has the potential to go out of control when the sub-committee of the *grama sabha* becomes functional on forestry issues (Upadhyay 2003).

Upadhyay (2003) expresses further concerns about the linkage of Panchayati Raj Institutions (PRIs) and JFM/CFM in view of the *Panchayats*' Extension of Scheduled Areas (PESA) Act 1996 to the Schedule V areas which are primarily dominated by the tribal people. He fears that the grant of ownership rights on minor forest produce and also transfer of general control over natural resources management to the *panchayats* can create parallel power structure in the same legal arena. In the wake of Scheduled Tribes Bill 2005 it becomes trickier as the '*grama sabhas*' are bestowed with the authority to recognise and vest 13 rights provided to the forest-dwelling Scheduled Tribes.

Gopal and Upadhyay (2001) have found that in Ampali village in Ranga Reddy district, there were no conflicts between the VSS and the *panchayat* simply because there was no income from the forests. On the other hand, Eliminedu village and its hamlet, Malluguda, in Ranga Reddy district experienced conflicts related to CPRs and forests between the *grama panchayat* and the VSS. The legal and policy

frameworks surrounding JFM need more clarity because the provisions of the executive order governing JFM often conflict with the Forest Conservation Act, and do not acknowledge that the poor depend most upon forest products (fuel wood, fodder, small timber and non-plant extractions) for their livelihoods. Policy makers must acknowledge this and accept local livelihoods within the context of forest management rather than see it as an obstacle to management (Gopal and Upadhyay 2001).

Commenting on the role and the synergy between FPCs and village *panchayats*, Tiwary (2005) in his study of Jharkhand and West Bengal mentions that the *panchayats* and FPCs worked in a relationship that was asymmetrical, territorial jurisdiction that was often contradictory and had leaders who would champion disparate agendas. Further, he mentions that while FPCs have used the forum to secure the forest usufruct whereas the *panchayats* were not always sensitive to the forest-based needs of the villagers. Making forest committees subservient to the *panchayats* would not be an effective solution to the forest management. Instead, FPCs and *panchayats* should complement each other for the better management of forest resources (Tiwary 2005).

CFM: The New Forest Policy of AP

The positive response to the JFM policy in AP encouraged policy makers, with support from the World Bank, to refine the approach further by broadening the concepts of CFM to manage the forest through 'VSSs' on the lines of CFM. This approach aimed to upgrade the initiatives taken under JFM. While JFM has been a partnership between the forest-dependent communities and the FD, CFM claims to be a more democratic process through decentralising and delegating the decision-making process, planning and implementation, with the APFD acting more as facilitators and providers of technical and infrastructure support.

The Difference between JFM and CFM

CFM is envisaged as distinct from JFM in a number of ways (Table 2). In JFM, a forest official is the member-secretary of the VSS managing committee; in CFM, the member -secretary is from the managing committee. VSS in JFM has one president position, which is often represented by a male member; but under CFM, there is a provision for two, that is, for president and vice-president; either or both should be women. With regard to the bank account, JFM has only one, while CFM has a provision for two, one for the project / government and the other for the VSS benefits. In JFM, the forest official and the president are the signatories, while in CFM both president and vice-president are signatories of both the bank accounts. Besides, for project account the third signatory is the forest official. In financial matters, in JFM the funds from DFO to VSS go through FRO and section officer, but in CFM, the funds are directly deposited in the account of VSS. The *panchayat* has

no relation with VSS in JFM while in CFM a *panchayat* president is on the VSS advisory council and also chairs the council meetings. JFM has no provision for the VSSs to levy and collect fines from forest offenders, while in CFM they do collect fine up to Rs 100 for the same. JFM envisages FD role as project implementer with the help of the VSS community. But CFM envisages FD role as that of a facilitator, while the VSS has to prepare and implement plans. Finally, CFM has a defined role for the NGOs whereas JFM has not any for them.

Table 2: Contrast Between JFM and CFM

	JFM	CFM
Implemented	GO 173 of December 1996	GO 13 of February 2002
Member Secretary of VSS managing committee	Forest guard	From the managing committee
President's position	One, which is often represented by the male member	Two, (president and vice-president) either or both should be women
Bank account	One	Two, one for the project / government, the other for VSS benefits
Signatories for the bank account	Forest official and president	President and vice-president signatories of both the bank accounts, for the project account and the third signatory is a forest official
Financial matters	The funds from DFO to VSS go through FRO and section officer	Funds are directly deposited in the VSS account
Panchayat	No relation	Panchayat president is the VSS advisory council and also chairs the council meetings
Collect fines from forest offenders	No provision	Collect fine up to 100 rupees
FD role	Project implementer with the help of VSS community	Facilitator, while VSS has to prepare and implement plans
Role for the NGOs	Not any	Defined

The CFM initiative makes many claims: it balances the local needs with external and environmental needs through increased productivity of the forest resources, reduced dependence on forests through substitution of demand and alternative livelihood opportunities, upgradation of living standards and, above all, inculcating a sense of ownership and pride among the forest-dependent communities engaged in CFM. Community and farm forestry programmes carry out the basic objectives by strengthening local leadership, promoting participatory approaches

and testing new approaches to JFM. The primary beneficiaries are the small forest farmers and landless people of forest areas (Roy 2001).

The legal backing for CFM has come through a package of supporting changes: the relaxation under Forest Conservation Act (FCA) for medicinal plants cultivation by VSSs, the liberalisation of the state monopoly of NTFP, conformity of *panchayat* laws with CFM regulations. Further, areas to which the programme plans to give special attention include conflict resolution among stakeholders and traditional rights, consistency of microplans with working plans. Other enabling issues, like poverty alleviation through skill upgradation and income generating activities, training and capacity building, empowerment of women and other vulnerable groups and NGOs' participation, are expected to receive attention.

Shortcomings of CFM Policy

Some apprehensions are expressed by some commentators with regard to the latest CFM policy. Sarin (n.d.) comments that although CFM claimed to be community driven' and 'for the benefit of poor' it was not, because the GO overlooked the interests of perhaps 50 per cent of the households who might be unwilling to join the VSS. Similarly, exclusion of other members apart from the two from each household from the membership is questionable.

Although, in theory, a valuable tool for ensuring forest management reflects the local needs, in practice, the 'micro plans' have generally conformed to the prescriptions of the wider FD working plan. There is no VSS representation in the State Level Committee unlike the case in Haryana and Himachal Pradesh. The nomination of VSS representatives for District Forest Committees by the collector is undemocratic. Although VSSs are supposedly entitled to all NTFP, due to the GCCs monopoly, VSSs are still expected to get NTFP permits from the DFO.

The 1988 Forest Policy spoke about the state government's right to permit shifting cultivation up to a period of three years and provide for the alternative. Later, JFM was recognised as one of the ways to provide livelihoods. But, nothing concrete has materialised, which is admitted by the FD, and thousands of tribal lands traditionally cultivated by them had not been regularised until 1995 and continued to be under dispute and unsettled (APAAV 2003). According to the FD, by 1994, over 327,742 ha of forest land was under illicit cultivation and encroachment. Out of the estimated 46,725 families who might have encroached forestland assigned to VSSs, the Resettlement Action Plan (RAP) under the CFM project provided for rehabilitation grant and livelihood opportunities to an estimated 11,680 families (Madhusudhan 2003). Sarin (n.d.) questions the reclamation of the *podu* land from the tribals by the FD depriving the tribals of their livelihood because the poor were neither being provided any secure rights to land and forest produce nor being empowered to make their own decision about how to use and manage their forests in accordance with their own priorities.

One issue that remains to be resolved under CFM is the rights over marketing of NTFP items, an issue that is critical to the livelihoods of the tribals. Under JFM, it is mentioned that VSS members have 100 per cent rights over marketing of NTFP. This is in contradiction with the stated policy that *Girijan* Co-operative Corporation (GCC) has "monopoly rights" for marketing of about 25 NTFP items. In a study titled "VSS Sustainability and the Role of GCC in Connection with CFM Programme in AP" (CWS 2003), it is mentioned that with the formation of VSSs, and providing for 100 per cent benefits out of Minor Forest Produce to the members, the primary stakeholders in respect of NTFP constitute two categories, viz., the tribal members of *Girijan* Primary Co-operative Marketing Society (GPCMSs) and the VSS members; of whom also there are tribal members to the tune of 30 per cent across the state. It is often felt by the VSSs and the people exclusively working with the VSSs, i.e., the FD and some NGOs, that they could get remunerative prices if they could go to private traders instead of GCC. This may be true for some items and in some areas but it is not true everywhere and for every item. Moreover, the influx of forest produce into the state is coming in the way of GCC offering remunerative prices to the collectors (CWS 2003).

On the other hand, integration and convergence of other governmental agencies with VSSs is highly spoken of under CFM. The GO 178 issued by the Environment of Forest, Science and Technology (EFS and T) on 17 -10 - 2003 to converge "VELUGU" (DPIP) with CFM was a case in point. The government had to burn its fingers when the GO 78 was opposed vehemently by the VSSs members with the active support of the NGOs on the ground that the existing VSSs would be dis-empowered.

In the light of all the GOs on JFM and the proposal put up by the PCCF of AP to refine the 'JFM' into 'CFM', the government after careful consideration decided to modify all the earlier orders issued on the 'JFM' to pave the way for the implementation of the 'CFM' in the state with immediate effect. Further, the government directed that the local 'village communities' should be constituted into VSSs and the already existing '*samithies*' should carry out the forest programmes jointly with the FD as per the latest rules. This GO will be put into practice for one year and learning from the experience of implementing this order and refining the concept further, suitable amendment to the Forest Act 1967, (which provides legal authority to forestry in AP) will be brought about (AP CFM Project).

Conclusions

JFM is a different concept from many earlier attempts to promote forestry needs of the people, simply because it builds from the roles played by both local forest users and the professionals employed by the state to act as custodians. The combined effort of community and government is the ultimate solution under the

prevailing circumstances. Therefore, the government intervention is expected to address the equity and transparency aspects to strengthen the voice of the poor. In the same way, participation of the people will warrant a constant vigil against all odds to protect the forests. Hence, VSSs should be viewed as an entity for overall development of the village resources and its people, and not merely an instrument of developing the degraded forests, more so when the new initiative of graduation from JFM to CFM is focusing on alleviating rural poverty.

For the success of any programme of this nature and magnitude, there is need for top-level commitment at both political and official levels and process transparency. In the same way, transparency wins the confidence of the people targeted by the programme. At the same time, the potentiality of the involvement of NGOs and other civil society organisations, who can play a crucial role, should not be ignored. Above all, if the programme is tailored to local conditions - cultural, institutional and geo-climatic - not throttling local creativity and innovation, there will be no stopping it. Though most of these aspects are addressed in the CFM initiative of AP, the effectiveness of the programme depends largely on the implementation. As in the case of watershed development programme in AP, the implementation could suffer due to the scaling-up of the programme. This issue is observed to be crucial for the success of JFM by many district forest officials. For, even in the case of CFM, FD continues to be the main implementing agency. The human resources of the department are not enough to follow the intensive approach of sustainable community participation when the scale of the programme is large, especially in the districts with larger forest areas. In this context, it is necessary to consider NGOs and *panchayats* as implementing agencies. There is also an urgent need to first resolve the contentious issues of forest dwellers' land and forest rights, providing them tenurial security for devolved management of community forests based on enhancing both livelihood and ecological security.

Note

[1] OM Consultants in its evaluation report has recommended 'horticulture' in a region with highly degraded forest for sustenance because the gestation period for usufruct is relatively longer in these areas (OM Consultants 1998).

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If only the Humanity were Willing to Protect Environment, How would be the Day after Tomorrow?

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Abstract

Free market economy cannot survive without growth. Eternally expanding economies and human population deterministically deteriorate environmental problems. Man sees nature as antagonistic and now he has the capacity to appropriate and use according to his needs any area on earth, thanks to science and technology developments. On the other hand, representative democracy has been developed into a highly hierarchical and concentrated regime, and it seems to be there only to secure capitalism and economic growth all over the world. Therefore, we cannot expect that capitalism and its twin, representative democracy, will ever actually protect the environment. Otherwise, there should be some unprecedented policy reversals where the keystone would be the building up of a new educational system aiming at producing generally and humanistically well-educated graduates, mature and integrated personalities, good and honourable citizens, far away from today's rapid and meaningless specialisation of illiterate and arrogant graduates.

"*And so the probable outcome of too much freedom is only too much slavery in the individual and the state*."
"*Probably, then, tyranny develops out of no other constitution than democracy – from the height of liberty I take it, the fiercest extreme of servitude*."

Plato, Republic, H 564a 7, 8

Introduction

Planet earth is a living organisation with a complex system of feedback and recycling which aims at prevailing an optimum physical and chemical environment. Any divergence triggers an automatic function of physical and

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chemical mechanisms that restore natural balances. Earth will continue to exist as a planet, revolving around the star (sun) of our solar system in our galaxy. However, this does not mean that life on earth will exist for ever or will be the same, or life could be 'possible' for human beings. Even if humanity had not harmed the environment, changes in our solar system might create such conditions that life for human beings or any living organisation would be impossible. Nevertheless, man has been harming the environment since the industrial revolution intensively and deliberately.

Prior to the industrial revolution, work was essentially limited by the amount of energy that could be harnessed by any one person or perhaps a small group of persons. The capacity to travel and gather materials to create products limited the arena of the worker. Lack of storage facilities and the time taken to produce things counteracted against mass production of goods. In fact, labour was the dominant factor of production, to the extent that skills were the result of a lifetime practice. Furthermore, the relationship between the worker and his physical environment was very close. Seasonal availability of raw materials and the lack of mass transportation facilities made it impossible for an individual to harvest products whenever he wished, to gather a large store of raw materials or to range far and wide upon exhausting local resources. Therefore, the sheer incapacity to appropriate, use or destroy large areas helped (up to the era of industrial revolution) maintain the balance between human beings and their environment. However, after the industrial revolution, the need to gain control over nature grew. Man was seen as 'un-free' to the extent he was limited by anything physical or social. Science and technology became then the tools that man could use for this liberation. The use of scientific knowledge to create technology to serve the individual marked the development of industrial society.

Economic growth needs not only a high savings propensity but also a highly materialistic mentality in the society: a growing labour force which (despite or due to unemployment) should be highly productive in order to produce a continuously increasing output *per capita*; a technological progress that will deterministically lead to growing productivity, but which is ethically neutral and has no limits in using intensively natural resources and living organisations (humans included) on earth as means of economic growth. Hirsch (1976) argues that free market economy does not accumulate "moral capital" (i.e., honesty, trust, freedom, cooperation) but on the contrary it exhausts it, and this exhaustion arises at a much greater cost than that from the exhaustion of any other kind of capital. Therefore, environmental deterioration (pollution, changes in the climate, appearance of new diseases, desertification etc, along with the extinction of species and renewable and non-renewable resources) could not be taken into consideration - even as a kind of natural capital "depreciation" - in the accounting of economic growth, since free market economy cannot survive without continuous growth.

Eternally growing economies have found their perfect counterpart in representative democratic regimes. As Balakrishnan *et al* (2003) argue, the debate on sustainable, globalised development rests on two clearly stated economic assumptions: (i) that development proceeds, through industrialisation and the promoting of capital-intensive high-technology, to the creation of service sector economies and (ii) that globalisation (based on a neoliberal, capitalist, free market ideology) provides the only vehicle for such development. Early capitalism was tied to growth and not to sustainability, and crises arose because the growth potential of capital was limited by the ability of accumulated capital to find outlets for new investments. But capitalism was also supported by an ideological rationalisation that it would benefit society as a whole. That is why the capitalist economy was connected to growth, and this is followed by the complicity of states in ensuring growth. The latest ideological rationalisation supporting a capitalist society is neo-liberalism. This seems identical to the appeal for free markets ("free-marketology") but at the same time demands the government intervention on behalf of the 'free market' economy. Therefore, governments now simply use tax money to subsidise private enterprise through tax breaks, grants, loan guarantees and other devices. In other words, capitalist states continue to seek ideas on how to flatten out the cycles of boom and bust that persist in the economies. As Vergopoulos (1999) points out, "free market" usually is the ideological alibi of the dominant upper class since the existed potential of markets is always manipulated by those controlling power through political and social frameworks. Therefore, through the market the upper class charges the cost of its political choices to the lower classes.

In a representative democracy, all this depends on the will of the electoral body, which normally consists of all adult members of the society/country/nation, with all their votes being equal. However, current economic literature on the functioning of democratic regimes reveals some very interesting aspects. Robinson and Torvik (2005), examining investments made in developing countries, found that investment growth had not led to output growth. Using a theoretical model they showed that investment projects with negative social surplus (named "white-elephants") may be preferred to socially efficient projects, if the political benefits were large compared to the surplus generated by efficient projects. Besley and Coate (1998) showed that policies that would be declared efficient by standard economic criteria were not necessarily adopted in political equilibrium and these divergences could be viewed as "political failures". Furthermore, Besley and Coate (2001) studying the impact of lobbying on political competition and policy outcomes found that coordination failure among lobbyists could result in Pareto inefficient policy choices. Senator Feingold (1998) explains how the explosion of "soft money" unlimited contributions to political parties from corporations, labour unions, and wealthy individuals, and tilted the electoral playing field (in the USA) away from ordinary voters, so that a "representative democracy" is displaced by a "corporate

democracy", in which a person or group's influence over the political process is in proportion to the amount of money they put into the process.

In an earlier paper, Levitt (1996) showed that the empirical results (for the USA) suggested that voter preferences were assigned only one quarter of the weight in senator utility functions; the national "party-line" also had some influence but the senator's own ideology was the primary determinant of roll-call voting patterns. The weight given to the preferences of supporters was two to three times bigger relative to non-supporters (which means that the median-voter theorem is in doubt). Lee, Moretti and Butler (2004) found that US voters elected (and not affected) policies and, therefore, the degree of electoral strength had no effect on a legislator's voting behaviour. Politicians cannot make credible promises to moderate their policies, and elections are merely a means to decide which one of the two opposing policy views will be implemented. Redoano and Scharf (2004) showed that policy centralisation was more likely to occur if the choice to centralise was made by elected policymakers rather than by referendum. In these situations, centralised policies converge to the preferred level of the jurisdiction that least favours centralisation, rather than to a compromise between the two jurisdictions' preferred levels.

Caselli and Morelli (2004) argued that low-quality citizens (in competence and honesty) had a "comparative advantage" in pursuing elective office because their market wages were lower than those of high-quality citizens and/or because they reaped higher returns from holding office. Furthermore, bad politicians generated negative externalities for good ones and, therefore, incumbent governments could influence the rewards of future policymakers, i.e. bad governments sowed the seeds for more bad governments. Finally, Thomassen and Schmitt (2004) addressing the ongoing debate on the democratic quality and legitimacy of the European Union, expressed their doubts about the democratic quality of a democracy based solely on government for the people.

Recent referendums in France and the Netherlands (in May and June 2005 respectively) about the approval of the Treaty for a European Constitution, clearly showed the distance between politicians and the people. The overwhelming majority of elected (by the people, to represent them in the national parliaments) politicians had exactly the opposite opinion about the Treaty from the electoral body, and despite the fussy and glamorous campaign of all the European lobby of politicians that favoured the Treaty, the majority of the electorate rejected it. The same distance for the same issue has been observed in the other European countries as well. But some of these approved the Treaty through their national parliaments (ignoring the people), and others had scheduled referendums, which, however, were cancelled later on, after the outcome of the French and Dutch ones. How can these elected representatives take a position exactly the opposite to that taken by the people whom they represent on such crucial issues? And how can they manage to represent

them again and get elected again and again through "democratic procedures"? Whom do these politicians actually represent in the present day representative democracies? Why does the electorate fail to replace the betraying politicians and find new leaders who would not betray the people again?

In the elections the electorate decides who will represent the people in the decision-making legislative and governmental bodies. Representatives are members of political parties and they get elected under their flag in order to implement the political/electoral programme of the party they belong to. The issues included in the programme should normally cover all aspects concerning the society/country/ nation. Organised groups with certain interests try to push political programmes and policies beneficial to their own interests. On the other hand, political parties calculate which of the organised groups would satisfy (or promise to satisfy) the maximum number of the electorate so that they could win the elections through the coordinated support of those groups. The interests of all these organised groups do not spread out to all aspects that concern the society/country/nation. Therefore, in the electoral programmes of the political parties, these "rest of " the aspects, if they are not overshadowed by the aspects which interest the organised groups, they are surely presented in a way that will attract independent voters or the applauds of the media but the promises will never be implemented. Sen (1995) is suspicious of a menu which offers the voter a choice over a subset of the set (over which that voter has expressed a ranking). According to Condornet principle, an alternative should be chosen if and only if it beats every other alternative in pairwise contests. That means, if a million people have the ranking (in descending order) x,y,z and a million minus one people order y,z,x, then there is indeed a case for selecting y, who (or which) is liked best or second best by all, but the "Condornet winner" is x, a choice that divides the electorate. Thus, Sen concludes that if isolated properties provide illumination, so do the overall workings of voting procedures. Myerson (1995) argues that plurality voting appears less competitive because it encourages blocs of like-minded voters to coordinate their support behind one big party, while approval voting and proportional representation facilitate the entry of new parties. But in multi-party parliamentary systems, manipulative leaders can influence the outcome of bargaining games simply by focusing people's attention on self-fulfilling prophecies about who will make concessions and who will not. Elections themselves are only part of the political process; a full specification of the election game also requires attention to post-election bargaining among elected officials. Therefore, the behaviour of these elected officials cannot be fully understood without considering what they must do to get re-elected.

The rest of the way to the election day is a game of shadow and light. Those who control information (some organised groups and/or the party in power) and manage to canalise the 'not organised' (independent-indifferent) votes - which

are the overwhelming majority - either to a certain party or to abstain, will win the elections. The graffiti on the wall says, "if elections were to change the world, they would have been illegal". Nevertheless, the truth is that "when *voters* of the representative democracy become *citizens* of the direct democracy, then the elections of the representative democracy would have no sense".

Free Market Economy and Environmental Deterioration

The economic theory, that has its origin in the Enlightenment period, depends on the Newtonian theory that 'to every action, there is an equal reaction'. Therefore, it has seen the market as a mechanism where demand and supply are continuously readjusted to each other. However, as Rifkin (2002) points out, the laws of thermodynamics say something completely different. Economic activity is essentially a loan of low entropy energy inputs from the environment and their transformation in goods and services of some value. During this transformation, more energy is lost and it returns to the environment, and incorporated in the produced good and service. Even this product is temporary since after its use or consumption it is decomposed or lost, and returns to the environment as used energy or waste.

Balakrishnan *et al* (2003) argue that capitalism emerged in response to specific circumstances relating to the development of certain technologies, but also accompanied by the emergence of ideologies meant to rationalise profit-seeking activities. The protestant variation on Christianity emphasised the value of labour for the salvation of the human soul setting the stage for unremitting pressure on the human being to work constantly. At the same time, John Locke understood private property rights, which contrasted significantly with the property claims of absolute monarchs. Locke's theories came at the hands of an emerging commercial class that required freedom of economic action and equal treatment by law. The detachment of the identity of the state from the larger entity of Christendom that followed the Treaty of Westphalia ensured the separation of morality from the making of public policy, which resulted in the perception of national interests increasingly in terms of capital accumulation. This alliance between the interests of the state and that of the capitalists, masked by the demands for *laissez-faire,* served to enhance the power of both entities and hit the workers the hardest.

Capitalism identifies wild (free) competition among profit maximising agents as human progress, and corresponds social status to greedy and unsatiable wealth accummulation. There is no historical evidence before the industrial revolution that a society had made these attitudes so crucial and essential for its existence. Economic growth has become since World War II (the period during which the conflict between "capitalistic" and "socialistic" systems resulted in the establishment of the first as the unique socio-economic system in the world and the collapse of the second)

really devastating for environment. Two factors contributed to this: (a) population growth, changes in population structure, and changes at the value of time in all human activities and (b) technology-based intense industrialisation.

Population growth leads to labour force growth, to productive capacity increases and consequently to production and consumption growth. All these, given the technology, cause increases in natural resources demand, in production of waste and pollution (inevitably produced by production and consumption), with obvious negative consequences for the environment. Demographers (Lee 2003) talk of a demographic transition, which started around 1800. During the transition first mortality and then fertility declined, causing population growth rates first to accelerate and then to slow again, moving towards low fertility, long life and an old population. Since 1800, global population size has increased from less than a billion to six billions and the length of life has more than doubled from 27 to 65 years. Low fertility and increasing longevity cause a 10-fold increase in the ratio of elderly to children. This global demographic transition changed the economic and demographic life-cycles of individuals.

Technological progress and increasing physical and human capital make labour more productive, raising the value of time in all activities. Physical capital may substitute for human strength, reducing productivity differentials between male and female labour and thus raising the opportunity cost of raising children. Women enter massively in labour force. Rising incomes shifted consumption demand towards non-agricultural goods and services. This increases the return on education, increases the share of industrial sector and employment and diminishes the share of agricultural sector and small land cultivators. Dependent, salary-based employment in industrial and later also in service sector dominates. Also a special kind of education has appeared, leading many rapidly to specialisation, in order to join them in the labour force.

Massive urbanisation is also a logical consequence. Even as capitalism reduces the worker to an efficient unit of production, the market has to turn to the worker, as consumer, who, according to its own logic, must have unlimited wants, all of which the market must try to satisfy. Thus, individuals are concentrated in urban complexes in order to get educated (and specialised), to find jobs, to find consumer goods with ease, to be close to public services and medical services and to entertain themselves. The social focus of globalised development is clearly the "individual" and the much-touted goal of development, in the context of these debates, is the emancipation of the individual from want. This glorification of the individual (so characteristic of the Enlightenment) has defined all aspects of modernity, leading to approaches that are self-focused and that give little thought to the needs of society or even to the social context. People are pushed to the passive role of "voters" and "taxpayers", since social bonds within members of the

small (villages/cities) communities are broken. Industries and services are also heading for the big cities where one can deliver/sell their products without having transfer costs, and employ spare labourers. At the same time, life in the countryside and small cities has appropriated the same characteristics as those of urban centres (due to improvements in transport and communications) and this facilitates thorough homogenisation of the production-consumption chain. Today, the global market place attempts to tie in the agricultural, industrial and service sectors in areas around the world (Balakrishnan *et al,* 2003). According to the Enlightenment logic, the individual will ride the continually rising seas of prosperity which would be impermeable of the environment. However, due to urbanisation and the modern living patterns, we have experienced changes in the micro-climate and other natural conditions and functions, along with huge concentration of waste and pollution which heavily erode the capacity of the environment to dessiminate them in elements that can be recycled.

Intense industrialisation based on technology uses bulk quantities of natural resources as inputs and also produces liquid and solid wastes (some of which are toxic and radioactive and cannot be decomposed by nature into recyclable elements) and air pollution which, along with industrial concentration, harms the environment. According to Rifkin (2002), endurable societies in human history have proved to be those which have managed to preserve a better balance between the energy budget of nature and that of the human society. Great civilisations have proved to be less successful and so Rifkin suggests that the reinvestigation of the rise and fall of great civilisations through the sight of thermodynamics may shed valuable light on the current crisis. New technologies, new industries, new activities bring new pressures on the environment. Some of these pressures are irreversible. Total environmental pressure is bound to increase with economic growth. Science and technology have become the tools that man can use for man's liberation from his physical environment. Harnessing knowledge within the structures of science and the use of this 'scientific' knowledge to create technology to serve the individual marks the development of industrialised society. Regulation is ineffective because of industry's successful resistance to it. Even full internalisation of environmental effects will not stop environmental change. Booth (1998) argues that profit maximising corporations will never care for the environment.

However, many economists disagree with the above view (Tol 1999). They depict the decline of coal and nuclear power and the emergence of gas and solar power as today's liberated energy markets. Also, they highlight the ban of ozone-depleting substances, or the careful treatment of biotechnology etc. However, as the United Nations Program for Development (UNPD 2002) reports: "The last few years, everywhere in the world, the productive process consumed less energy. However, due to the increase in production, these progresses are obviously

inadequate for the decreasing of the carbon dioxide emissions in world level." (pp. 28) I believe that the probability of the humanity's survival depends on its future relation (actually its harmonic balance) with the natural environment. The problem of environmental deterioration cannot be solved by the invention of new technologies which will substitute for natural processes. As Bookchin (1989) argues, this kind of substitution cannot be effective without the existence of a highly disciplined system of social management which is compatible only with a totalitarian political system which will force people to obey and not to cheat. According to Tainder (1988), the collapse comes when a mature civilisation reaches the point where it is forced to spend an always bigger part of its energy stock in order to preserve the complex social structure while it faces diminishing returns of energy used *per se.*

Some Unpleasant Arithmetics

Shah (1998) argues that behaviour is motivated by survival, and human beings have multiplied rapidly and they have been highly adaptable and able to manipulate the environment. Here, I would like to risk an attempt to estimate the human population on earth using as measure the life of a pre-industrial man (in 1800 AD) and the burden that he and his activities put on the environment. Then, I will estimate the population of the equivalent pre-industrial people as they live on earth today and the burden of their activities on the environment. Thus, I hope this will make clear what the population transition and technology-based intensive industrialisation actually mean for the environment. I will start presenting some numbers, from the World Development Reports (WDR) of World Bank (also reproduced in Gillis *et al*, 1996) (Table 1). I divide the countries into low-, middle- and high-income groups, and I present for each of these four characteristics: the population (column A), the expected life duration (column B), the yearly per capita consumption of energy in litres of equivalent petrol/oil (column C), and the daily per capita calories of food consumption (column D). I assume that the dependence between columns C and D is not significant. In the fourth row, I present the earth's population and life expectancy in 1800 (as in Lee 2003) and I assume that the pre-industrial man consumed yearly 100 litres of equivalent oil (mainly timber and carbon) and he consumed daily 1,000 calories in food. I have the impression that these last numbers are not far from reality in 1800.

In Table 2, I estimate from column 1 the ratios obtained from the division between row 1 and row 4 (1:4), between row 2 and row 4 (2:4) and between row 3 and 4 (3:4) successively. These have been presented in columns A, B, C and D of Table 2. In the fifth column (Table 2's column E), I estimate for each row the multiplication of columns B,C,D of Table 2. So, what we see in column E of Table 2 is that (i) every person living in the low-income countries today is equivalent (on average) to 18.483 pre-industrial persons of 1800, (ii) each person living in the middle-income countries

Table 1: Human Population, Expected Years of Life, Consumption of Energy and Food Now-a-days (1992) and in 1800 AD

		A	B	C	D
		Population in billions	Expected years of life at birth	Consumption of energy (yearly *per se* in litres of equivalent petrol/oil)	Consumption of food (calories daily *per se)*
1	Low-income countries (1992)	3.19	63	370	2,144
2	Middle-income countries (1992)	1.41	66	1,404	2,787
3	High-income countries (1992)	0.83	77	5,054	3,338
4	Earth in 1800 AD (average of all countries, approximately)	1.0	27	100	1,000

Sources for numbers in Rows 1,2,3 of Table 1:
Column A (population in billions, 1992): Gillis *et al*. (1996) Tables 1.2 and 8.3 (from WDR(1994) pp. 222-23).
Column B (expected years of life at birth, 1992): Gillis *et al*. (1996) Table 1.1 (from WDR (1994) pp. 162, 222)
Column C (consumption of energy, 1992, approximately, mean average): Gillis *et al*. (1996) Table 1.1 (from WDR (1994) pp. 170, 220)
Column D (consumption of food, 1989, approximately, mean average): Gillis *et al*. (1996) Table 11.4 (from WDR (1992) pp. 272-273)

is equivalent (on average) to 95.476 pre-industrial persons of 1800 and (iii) each person living in the high-income countries is equivalent (on average) to 480.802 pre-industrial persons of 1800 respectively. If we multiply column A by column E of Table 2, i.e. the number of pre-industrial persons that are equivalent (as a burden on the environment) to one modern human being (of 2000) in each income category of countries (low, middle, high) multiplied by the human population today in each category of countries (column A either of Table 1 or Table 2) respectively, we take the numbers given in the first three rows of column F of Table 2. Summing up one can say that these three numbers of column F who live on earth today are an equivalent of pre-industrial (of 1800) human population of 592,649,000,000 (approximately 0.6 trillion) people.

Table 2: Equivalences (as a burden to the environment) of Modern Human Being (living in low-, middle-, high-income countries) to the Pre-Industrial Human Being of 1800AD

	A	B	C	D	E	F
Ratios of Table 1 Rows	Population in billions	Expected years of life at birth	Consumption of energy (yearly *per se,* in litres of equivalent petrol-oil)	Consumption of of food (calories daily *per se*)	Product of multiplication of columns B,C,D of Table 2	Product of multiplication of columns A and E in billions
1:4	3.19	2.33	3.70	2.144	18.483	58.962
2:4	1.41	2.44	14.04	2.787	95.476	134.621
3:4	0.83	2.85	50.54	3.338	480.802	399.066
SUM						592.649

Furthermore, since land on earth is estimated to be 149,000,000 km^2, in which 20 per cent is desert (where the 5 per cent of the population today lives), then we can estimate the equivalent of pre-industrial human population land *per se* today at 251m^2 per person (or 212m^2 if we exclude deserts). I know that their might be some objections to the column C, as technological progress has started to develop and relearn using less harmful energy sources (like gas, solar, wind power etc). But, if this happens in some high-income countries, we can't expect that these will be the main sources of energy power when India, China and other big developing countries become fully industrialised (see also UNPD 2002). In Table 1 of McKibbin and Wilcoxen's (2002) paper, it was estimated that the emissions of carbon between 1990 and 1999 had increased in USA by 12 per cent, in Mexico by 20 per cent, in Central and South America by 38 to 41 per cent, in India by 56 per cent, in Australia by 31 per cent, in Japan by 14 per cent and in China by 8 per cent. The only countries that reduced their carbon emmissions between 1990 and 1999 were Germany (by 15 per cent), UK (by 7 per cent) and Russia and the former communist countries of Eastern Europe (by 38-40 per cent, probably due to the collapse of their centrally planned economies).

According to Lee (2003), in 2050 the population would be around 9 billions with life duration 74 years. Assuming for all income categories an average of 3,000 litres of energy consumption and 3,000 calories of food consumption in 2050, then we have the ratio for the year: 2.74X30X3=246.6 pre-industrial humans (of 1800 AD) corresponding to each human life in 2050. Thus, the equivalent of pre-industrial human population projected for 2050 is approximately 2.22 trillions, with land *per se* equal to 70m^2 per person (59m^2 if we exclude deserts). As Harribey (1997) points out, the "ecological footprint" (i.e., the area of earth needed to host all human activities, while preserving the ecological balance undisturbed) has already reached

120 per cent of the planet and – taking into consideration the great inequalities observed in the level and degree of development among the rich and the poor countries – four or five planets of the size of earth would be necessary if the world human population consumes and produces waste at the same rate as the United States' citizens do.

Daly (1991) argues that the best index for the scale of human economy as a part of the biosphere is the percentage of human appropriation of the total world product of photosynthesis. Net Primary Production (NPP) is the amount of solar energy captured in photosynthesis by primary producers, less the energy used in their own growth and reproduction. NPP is, thus, the basic food resource for everything on earth not capable of photosynthesis. Daly refers to a study by P. Vitousek, P. Ehrlich, A. Ehrlich and P. Matson (in *BioScience* of May 1986) where it is calculated that 25 per cent of potential global (terrestrial and aquatic) NPP is now appropriated by human beings. If only terrestrial NPP is considered, the fraction rises to 40 per cent. Human appropriation in that study includes direct use by human beings (food, fuel, fiber, and timber) plus the reduction from the potential due to degradation of ecosystems (deforestation, desertification, paving over and human conversion to less productive systems such as agriculture) caused by humans. Taking 25 per cent as today's NPP appropriation by humanity, twice doubling of the human scale will give 100 per cent appropriation. Since this would mean zero energy left for all non-human species and since humans cannot survive without the services of ecosystems, it is clear that twice doubling of the human population is an ecological impossibility.

Sustainable development has been described by the Brundtland Commission as that meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, pp. 43-44). This means that Brundtland Commission dealt with the problem in terms of re-distribution rather than challenging the notions of growth that accompany capitalist economies. However, since the early 1990s, after the minimal restrictions on globalisation (placed there by the presence of the Soviet "communist" society) vanished, the debate on sustainable development moved to draw in production as well as consumption (see Balakrishnan *et al,* 2003).

Can Capitalism and Representative Democracy Save the Environment?

Biblic god should be proud of the achievements of his sons and daughters. They were finally augmented in population and conquered the planet earth. However, there are a lot who believe that earth cannot lift the burden of an eternally growing humanity and its boosting activities. What should be done? Should we control births? Should we start killing the elders? Must we restrain energy consumption?

Or should we eat less? Herman Daly (1991) argues that societies should control births and proceed to a fair distribution of resources and produced income. But why do high-income countries, with which the low- and middle-income ones try to converge economically (imitating their development paths), consume so much goods and energy (Arrow *et al*, 2004)? Because people feel dependent, unsafe and uncertain for their own selves, their status and their surrounding communities throughout their lifetime. They lead a fast life, try to earn as much income as they can, they try to satisfy their needs which often change, travel too much and very fast, and show themselves off ("entertain") too often. People live within a system where there is very little control over the present, let alone the future, leading to very short-term decision making at the individual and social levels. As Piety (2004) points out, "We are increasingly a culture that looks neither to the past nor to the future, but only to the next 'quarter', or to the next Delphic pronouncement by Alan Greenspan" (pp.103). Time, as a physical coordinate and an experienced dimension of existence, must be counted as a limit along with finite space (Linder, 1970). I believe that the only way of escaping from this deadlock is for the humanity to adopt the reversed order of values.

People should feel non-dependent in the crucial dimensions of their existence (work, means of living, way of living etc), and they should feel free to express and support their personal views. Harribey (1997) says that behind the issue of growth is hidden the issue of employment and, therefore, the issue of transition to a society of thrift and solidarity. If we criticise the patterns of capitalistic growth or development, we should contemporaneously doubt the capitalistic social relations as well. And I wish to add that in order to be consistent we should question the social relations established since the industrial revolution, according to the spirit of Protestantism and Enlightenment, as capitalism was not their only descendant. Non-dependent persons are those that are not making their livings in a dependent, contingent, salary-based work. Remember that in the pre-industrial period, working for another person (who was not a close relative) was considered the consequence of very bad luck in one's life. The German equivalent for the word work (*"arbeit"*) actually means being an orphan. In French, *"travail"* means the torture of three-pole wheel (Tziropoulou-Efstathiou 2003), and in modern Greek, 'work' ("δουλειά") is related to 'slavery' ("δουλεία").

Self-employment or employment in a family enterprise was considered the decent way of making a living in the pre-industrial societies. Most of the time and for a majority of the population (even in the cities), work included cultivation of small parts of land and breeding of livestock for self-consumption. When salary-based dependent work again becomes an insignificant part of production process, then we would have again become independent personalities – citizens who could have independent opinions and could express them too.

We should have that kind of education which will create integrated personalities because only persons with sufficient knowledge in most subjects that generally interest their community can express an independent view. And some of these views could be brilliant and offer solutions to certain problems. We need a mentality in the society that could produce again personalities like Pythagoras, Aristotle or Leonardo da Vinci.We also need universal scientists who could express personal views, synthesising broad fields of knowledge with today's specialisations. Today's educational system creates immature, dependent and completely specialised personalities. We need people with general and humanistic education (called in Greek language *paedeea -Παιδεία*), balanced personalities, conscious citizens.

Specialisation, which has been idolised nowadays, was thought to be a perversion in pre-industrial era. Ancient Greek saying «*Μηδέν 'Αγαν*» meant "never devote yourself to anything or anybody too much". Specialisation means that nobody can have an opinion about the work of the specialists and its consequence for/in the future, because nobody has the knowledge to analyse and judge it. Everybody is specialised somewhere because deceiving the ignorants (all the others) is an easy way to become successful, recognised, powerful and wealthy. Inside the clubs of different specialisations, there is the absolute interest not to reveal the deceits made by the other comrades: it is a case of specialists against the ignorant. Capitalism is a "free mansion" world. That's why present educational system of complete specialisation, which aims at producing immature and dependent personalities, is the ultimate supporting pillar of free market economy.

People should find the way to feel happy with themselves, which is also the work of education in classical studies, and should know the value of free time and how to use it. People should escape from Cartesian rationalism (where all issues are capable of being examined in isolation, in a linear fashion rather than within a system circle, marginalising thus the human element) and feel again as part of the universe. They should be conscious that happiness is the balance between one's micro-world (in time and space) and macro-world (universe). Physical and mental health of the humanity depends essentially on this balance. When the humanity realises this truth, many things will become different. Man will realise his real dimension. He would be happy and confident in himself and respect for the natural world, on earth and in outerspace. He would feel himself to be a part of the universe where life and death are natural processes. He would realise that what today's scientists are calling the pre-historical era would not be so distanced.

People should start seeing themselves again as members of a community, in which they participate, caring about its welfare and helping the other members (which is the meaning of ancient-Greek "citizenship", far away from the modern Protestant fashion of "charity"). They decide the ways and policies to solve their problems and they are not waiting for solutions from outside their community.

Kontogiorgis (2003) claims that today's free market economy is producing social and political energy that can be compared with that of the city state of the 7th or the beginning of 6th century BC in Greek antiquity (two centuries earlier than the golden era), because it is not only the size that permits or prevents the integration of the system but its unfolding in the temporal and spatial dimension. We are in a political system where authorities manage to obtain power which doesn't have roots in the society. Therefore, the social body has been forced to become dependent from that independent source of power. That's why local governments (that flourished after World War II) instead of being part of the local social body, tended to be more tyrannical than general governments. The political system that needs mature, independent and integrated personality of a conscious citizen is that of self-governed small cities or areas, where citizens continuously participate in taking decisions. Then cities could be combined as cofederations or states according their national/ cultural beliefs, history and consciousness. "Representative democracy" of the free market economy (that was tended to be imposed in all over the world, after the fall of communism) is a fallacious democracy. Aristotle, in his *Politics*, defined a number of political regimes. Our present day "representative democracy" has nothing to do with the Aristotelian definition of democracy, and it is clearly closer to his definition of "oligarchy".

Finally, we should restore again the ethical relation between producer and consumer, securing moral responsibility of the former for the product that he sells to the latter. We should restore again the belief that a special relation should exist between the producer and the product, which constitute an ethical guarantee for that product forever. If this ethical relation becomes again a common belief, then capitalism will have no role on earth. If specialists cannot accumulate wealth by deceiving the ignorant people, the industry of producing illusions and that of creating products/services, which satisfy the unsaturated deceptive needs, collapse as well; then "free market economy", "economic growth", "representative democracy" would be found in the history of a new Atlantis in the work of a future Plato.

Epilogical Queries and Some "Policy Implications"

Will it be possible for today's "democratic" regimes of the free market economy to turn around the switch? Would they be able to stop growth that harms the ecosystems? Would it be able to save the environment?

I cannot imagine any power that can make the "rational agent", the modern individual, willing to save the environment (see also Bourg, 2003). The only operation that the regimes are capable of organising is the colonisation of other planets to save all the favourites and the intelligentsia of the "free market economy" and "representative democracy" when planet earth becomes uninhabitable for human beings. Otherwise, there should be some unprecedented policy reversals.

Of course, they cannot move populations out of the big cities or ban contingent salary-based labour. But they can ban the use of pesticides and other chemicals in agriculture and the cultivation of genetically modified seeds, they can ban consumption by humans and animals of any such plant/fruit/vegetable. They can ban breeding of livestock with provisions that are not in their genetical food chain (like mixed animals powder etc). They can ban the production of standardised food products, which is the backbone of unsaturatable consumerism.

It is also necessary to ban suggestive advertising, the source of illusive and false needs creation. Psychologists know how suggestive advertising targets the subconscious of audiences and readers. It is easy to distinguish it from the pure informative advertising.

But, the keystone is the building up of a new educational system aiming at producing well-educated (generally and humanistically) individuals, mature and integrated personallities, good and honourable citizens - a far cry from today's rapid and meaningless specialisation of graduates.

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Perceptions of Groundwater Sharing and Community Prosperity: An Ordered-Probit Approach

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Abstract

This paper presents an ordered-probit approach to model the effects of 'objective' variables, such as age, education level, income, caste, household size and land endowment of farm households, on perceived (subjective) attitudes to groundwater sharing and community prosperity of the household. The independent variables used in this study represent the social, economic and demographic characteristics of the households and social capital. The results show that age, size of the landholding, household size and trust have significant influence on the household's attitude to groundwater sharing and community prosperity. The social variable, the education and economic variable, income have no significant effect on the household's subjective judgment on groundwater sharing and prosperity. This study suggests that while designing policies, the socio-economic and demographic attributes of the farmers and social capital be considered to reflect the altruism in the groundwater resource allocations.

Introduction

In India, where agriculture is heavily dependent on irrigation, groundwater is an increasingly important resource for small and marginal farmers. Given the little or no access to surface water in many regions of the country, access to groundwater is of paramount importance in agriculture. According to the International Water

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Management Institute (2002), groundwater is sustaining 60 per cent of India's irrigated area and 60 per cent of irrigated food crops (Shah *et al* 2000). With the limited access to groundwater for irrigation, farmers are installing tubewells to access the resource. However, farmers who cannot afford to drill deeper remain deprived of groundwater for irrigation in groundwater-scarce regions such as peninsular India (Diwakara and Nagaraj 2003). The question is: how can groundwater – a common pool resource[1] – be accessed by small and marginal farmers? The answer lies in institutional designs that shape the equity (in access), efficiency and sustainability of groundwater use.

In India, although the need for institutional designs is well recognised by scholars and policy-makers, little has been achieved in practice. There are increasing evidences that in many parts of India, where the potential for creating new irrigation capacity is limited, resource users self-organise for a collective action (Aggrawal 2000, Diwakara and McKay 2005, Shah 2000, VIKSAT 1998, Ostrom 1990, Wade 1988). The collective action has taken the form of the social phenomenon of collective tubewell ownership to access groundwater.

Although much research has gone into the economics of these collective tubewell ownerships (Dubash 2000, 2002; Shah 2000; Shah and Raju 2001; Meinzen-Dick 1997), there is little or no evidence as to: What are farmers' attitudes to the way groundwater is shared in a self-organised collective tubewell ownership? Whether farmers perceive their community as prospering? Do social, economic and demographic characteristics of the farmers affect these subjective perceptions? Understanding these aspects is important from the perspective of policy-making. For example, despite self-organised efforts by the farmers to invest in collective tubewell ownership, if there is no improvement in their social and economic status (for instance, increased farm income), joint effort by the farming communities can be considered complementary to the state authorities' tasks in developing tenable policies to suit local conditions. From the policy perspective it is important to uncover some determinants, especially, social, economic and demographic characteristics of farmers. This would then assist the planners and policy-makers in targeting the beneficiaries. This paper addresses these issues in a quantitative regression-based framework.

The approach is simple in that, we ask the households: to what extent groundwater is shared fairly in the community and to what extent they agree that their community has prospered in the last five years. The answer to this type of questions in a community-managed groundwater resource system is inadequately researched in India. A fair criticism of this approach may be that the questions asked of the households are too 'subjective' in the sense that the ordinal ranking of the choices does not represent the same feeling of each household towards fair share of groundwater and community prosperity in the region. This is a theoretical

approach that needs to be verified through empirical evaluation of determinants that are thought to explain the differences in households' perceptions to groundwater sharing and community prosperity[2] .

The theory behind considering the two dependent variables is that: groundwater sharing can indicate cooperation between farmers and the prosperity of the community can indicate farmers' welfare improvement over a period of time (five years in this study). There is inadequate empirical literature directly connecting the determinants of water sharing and community prosperity in a self-governed tubewell partnership context. This research suggests that to explain performance of self-governed tubewell partnerships, it is important to consider two aspects: (i) the extent of fair sharing of groundwater between farmers and (ii) the extent of farmers' perceptions of the overall prosperity of the community in the last five years. There can (may) be multiple factors that reflect the performance of self-governed groundwater well organisations, such as economic efficiency of groundwater use, annual cost of groundwater use, annual externality cost and so on. For the purpose of this study, two aspects – water sharing and community prosperity – have been considered.

This study presents an ordered-probit approach to model the farmers' choice of ordinal categories that best represent their perception of groundwater sharing and community prosperity. The individuals have been asked to indicate their position, using an ordinal scale, such as: 'strongly agree', 'agree', 'neutral', 'disagree' and 'strongly disagree'. The discrete outcomes in the econometric model (probit) consist of the extent of farmers' position with regard to the fair share of groundwater in the community. The last category is labelled as 'strongly disagree', which in reality implies that the farmer never gets his/her equitable share of groundwater in the community.

A reasonable hypothesis is that if groundwater resource is shared fairly, it must have resulted in prosperity of the community in the last five years[3]. The underlying assumption is that when groundwater resource is shared equitably or fairly between farmers in a given community, they are likely to prosper socially and economically. For example, if a farmer gets his or her fair share of groundwater for irrigation to irrigate his land, he/she is likely to earn a major portion of his/her income from groundwater-dependent activities. This theory holds true in the areas where farmers heavily depend on groundwater resource for irrigation with no recourse to conjunctive use. Diwakara and Chandrakanth (2005) in their study in Haikal DPAP Watershed Development Programme in Chitradurga, Karnataka, have shown that increased physical and economic access to groundwater for irrigation improved farmers' net income. When choosing between different categories representing groundwater sharing and community prosperity, a farmer compares his/her economic well-being for a given amount of his/her groundwater resource allocation in the community.

This study posits that the 'objective' variables representing social, economic and demographic attributes of farmers have considerable impact on the attitude to groundwater sharing and community prosperity. More specifically, we expect that if the farmer is economically powerful in terms of large landholding, high income, and large number of dairy animals, he is likely to 'strongly agree' that the groundwater resource is shared fairly in their community. This study goes further to examine the relationship between other qualitative independent variables, especially, social capital of the farming communities like the trust in the community, trust in the formal organisations like the legal system, central administration, state government and trust in the water authorities like Irrigation Department Officials[4].

Data

The data used for this paper are a part of a larger survey conducted as a part of my PhD dissertation. The primary data were collected from 150 groundwater users of tubewell partnerships (self-governed entities) in Mehsana District, northern Gujarat, India. A sample of 150 groundwater users represented 50 tubewell partnerships spread across five villages. An equal number of tubewell partnerships were selected from each village. The survey was carried out in the year 2004. A random sampling method was used to identify the farmers in five villages in Mehsana District. We collected information on demographic characteristics such as age, household size, and socio-economic conditions of the households, including information on land ownership, annual farm income, educational level, caste and aspects of groundwater sharing and community prosperity. The choice of these variables was based on literature on common pool resource studies (Agrawal and Gupta 2005, Kumar 2002) and our presumptions that social, economic and demographic characteristics of the farmers affect the perceptions of subjective judgment on groundwater sharing and community prosperity.

Econometric Model

In the empirical application, we consider five outcomes with respect to the groundwater sharing and community prosperity that farmers 'strongly agree' to the statements: 'in this community, groundwater is shared fairly', and 'this community has prospered in the last five years.' A farmer may 'strongly agree', 'agree', 'neutral', 'disagree' or 'strongly disagree' (see, Table 1 for measured dependent and independent variables). Note that we assume that in the latter choice outcome, a farmer totally rules out fair share of groundwater in the region and, thus, is less satisfied with the current rules for groundwater allocation. Because of the inherent ordering of the different outcomes, we can make use of an ordered-probit model to analyse the choice of ordinal outcomes that best represent farmers' views (Greene 2003, Becker and Kennedy 1992).

Table 1: Dependent and Independent Variables

Variables	Description
FSGW	"In this community, the groundwater is shared fairly." (1: strongly agree; 2: agree; 3: neutral; 4: disagree; and 5: strongly disagree).
CP	"This community has prospered in the last five years." (1: strongly agree; 2: agree; 3: neutral; 4: disagree; and 5: strongly disagree).
Education	No education: Low: primary and secondary; Medium: high school and pre-university; High: undergraduate and post-graduate
Caste	Dummy variable: 1 = Patels; and 2 = others (Desai, Takur, Thakore, Rajput, Chaudhari).
Total land area	Land area owned in bighas (1 bigha = 0.24 hectare).
Dairy animals	Number of dairy animals (milch cows).
Income	Low: up to Rs. 24,999 per year; Medium: Rs. 25,000 to 59,999 per year; High: Rs. 60,000 per year and above.
Age	Young: 18-34 years; Middle: 35-49 years; Old: 50 years and above.
Household size	Small: up to 3 dependents; Medium: up to 6 dependents; Large: more than 6 dependents.

The five values of the two dependent variables: groundwater sharing and community prosperity can be viewed as the outcome of a continuous process defined by a latent (unobservable) variable. This latent variable can be named 'fair share of groundwater' denoted by FSGW and can be operationalised as the following empirical model:

$$FSGW = \alpha + \beta * Social + \delta * Economic + \gamma * Demographic + \varepsilon \quad .....(1)$$

Similarly, the latent variable for community prosperity (CP) can be operationalised as follows:

$$CP = \alpha + \beta * Social + \delta * Economic + \gamma * Demographic + \varepsilon \quad ..... (2)$$

Where,

FSGW = the extent of farmers' attitude to fair share of groundwater in the community.
CP = the extent of farmers' attitude to community prosperity in the last five years.
Social = (level of education, caste)
Economic = (total land area, number of dairy animals, annual income)

Demographic = (age, household size)
α = Intercept or constant.
β, γ, δ = Coefficients.
ε = Error term with 0 mean and constant variance.

Equations (1) and (2) can also be written in the following latent regression form:

$$y_i^* = x_i^{'}\beta + \varepsilon_i, \qquad \text{.....(3)}$$

Where

y_i^* = is an unobserved latent variable, reflecting the measure of fair share of groundwater and community prosperity indicated by farmer i.

$x_i^{'}$ = is a vector of explanatory variables describing the social, economic and demographic attributes of farmer i.

β = is a vector of parameters to be estimated, and

ε_i = is a random error term (assumed to follow a standard normal distribution with, $\varepsilon \sim N(0, \sigma^2)$).

The observed and coded discrete variable, measuring the extent of fair share of groundwater between the farmers in the region y_i^*, is determined from the model as follows:

$$y_i^* = \begin{cases} y = 0 \quad if \quad y^* \le 0, \\ y = 1 \quad if \quad 0 < y^* \le \delta_1 \\ y = 2 \quad if \quad \delta_1 < y^* \le \delta_2 \\ y = 3 \quad if \quad \delta_3 < y^* \le \delta_3 \\ y = 4 \quad if \delta_4 \le y^*. \end{cases} \qquad \text{..... (4)}$$

The δ s represent "thresholds" to be estimated along with the parameter vector β. Since we assume that the error term $\varepsilon_i's$ are normally distributed with the mean and variance of 0 and 1, we obtain the following probabilities:

$$\begin{aligned} &\Pr ob\,(y = 0 = Strongly\ \ Agree) = \Phi(-\beta' x), \\ &\Pr ob\,(y = 1 = Agree) = \Phi(\delta_1 - \beta' x) - \Phi(-\beta' x), \\ &\Pr ob\,(y = 2 = Neutral) = \Phi(\delta_2 - \beta' x) - \Phi(\delta_1 - \beta' x), \\ &\Pr ob\,(y = 3 = Disagree = \Phi(\delta_3 - \beta' x) - \Phi(\delta_2 - \beta' x), \\ &\Pr ob\,(y = 4 = Strongly\ \ Disagree) = 1 - \Phi(\delta_4 - \beta' x). \end{aligned} \qquad \text{..... (5)}$$

where $\Phi(\cdot)$ denotes the cumulative standard normal function. The model defined in (5) is an ordered-probit model and the coefficients β are estimated through the maximum of the log likelihood function. These estimates of the coefficients have been presented in Table 5.

Based on the results, we can compute the marginal effect of each independent variable.

These have been computed as the conditional probability at means of all other variables:

$$\begin{aligned}
\frac{\partial \Pr ob[y = 0 = StronglyAgree]}{\partial x} &= -\phi(\delta_0 - \beta' x)\beta, \\
\frac{\partial \Pr ob[y = 1 = Agree]}{\partial x} &= [\phi(\delta_0 - \beta' x) - \phi(\delta_1 - \beta' x)]\beta, \\
\frac{\partial \Pr ob[y = 2 = Neutral]}{\partial x} &= [\phi(\delta_1 - \beta' x) - \phi(\delta_2 - \beta' x)]\beta, \\
\frac{\partial \Pr ob[y = 3 = Disagree]}{\partial x} &= \phi(\delta_2 - \beta' x)\beta
\end{aligned} \qquad \text{.....(6)}$$

where $\Phi(\cdot)$ denotes the standard normal density function. Following Anderson and Newell (2003), the density function can be estimated as follows:

$$\phi(\beta' x) = \frac{1}{\sqrt{2\pi}} \exp(-\frac{1}{2}(\beta' x)^2) \qquad \text{.....(7)}$$

On the basis of marginal effects we are then able to arrive at conclusion about the size of influences of different socio-economic and demographic attributes of farmers on the choice of subjective community prosperity and groundwater sharing. Some plausible hypotheses have been presented here to understand the causal effects of a set of independent variables, such as age, education level, income and size of the household of farmers, on their attitude towards 'fair sharing of groundwater' and 'community prosperity' in the region (see Table 2).

For the purpose of examining the relationship between social capital variables, a community prosperity factor analysis (principal component analysis) was carried out to determine the underlying structure in the data. The principal factors are then used in a binary logit regression model of the form:

$$P(Y) = \frac{1}{(1 + \exp(-\alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6)))} \qquad \text{.....(8)}$$

where

P (Y) = probability of high prosperity, Y = Community prosperity (1 = high, 0 = low), x's are independent variables (principal factors) and ß's coefficients of the independent variables.

Table 2: Hypotheses and Reasons

Independent Variables	Hypotheses	Reasons
Age	Old farmers with more experience in farming perceive a fair sharing of groundwater and their prosperity in the region.	Farmers who have been staying in the same region and farming are more likely to indicate that groundwater is shared fairly between farmers in the community and that their community has prospered over time.
Land	Farmers with large landholdings are more likely to perceive a more equitable groundwater sharing and community prosperity.	Farmers with greater physical access to land have better prospect for irrigating their land to earn better income from irrigated agriculture.
Dairy Animals	As the size of the dairy increases, farmers tend to perceive that groundwater resource is shared fairly.	Farmers with more no of dairy animals require more groundwater than farmers with a few dairy animals. These farmers buy ground water from sellers to feed their animals and hence, reap higher benefits by supplying milk to the dairy cooperatives.
Caste	Farmers belonging to high caste are more likely to recognise that groundwater is shared fairly among the members of the society and that their community has prospered.	High caste farmers (e.g. Patels) who are social elites and have high status share social and economic well-being in the community. These frames are more likely to agree that groundwater is shared fairly among the members of the community.
Education	Farmers with low education level tend to suggest that there is equitable sharing of groundwater in the commnity which leads to the prosperity of the community.	Low educated farmers stick to farming compared to their counter parts who migrate to places to earn better incomes.
Income	Farmers with high annual income are more likely to perceive that groundwater is shared equitably among the members of the community.	High annual income enhances farmer's ability to buy groundwater to irrigate their land, which generates more income for them.
Household size	Large households are more likely to perceive that groundwater is shared fairly in the community.	A farm family with a large number of household members have the opportunity to pool resources to access (buy) groundwater to support their family and have opportunity to reap the benifits of irrigated agriculture and dairying.

Empirical Results

In this section, empirical results have been reported with some relevant discussion. Table 3 provides responses to query: In this community, groundwater is shared fairly and this community has prospered in the last five years. The results show that a vast majority (63.5 per cent) of the farmers 'agree' that groundwater is being shared fairly in the community. Considering the improvement in the welfare of the groundwater users in the last five years, about 45 per cent of the farmers 'agreed' that their community has prospered in the last five years.

Table 3: Response to Groundwater Sharing and Community Prosperity in Mehsana, Gujarat, India, 2004

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
In this Community, groundwater is shared fairly	54 (36)	95 (63.5)	-	1 (0.05)	-	150 (100)
This community has prospered in the last five years	37 (25.0)	67 (44.6)	15 (10.0)	31 (20.4)	-	150 (100)

Note: Figures in parentheses are percentages of the row total
Source: Field Survey, 2004

Table 4 gives summary statistics on the selected explanatory variables. The use of explanatory variables is justifiable in exploring the effects on the farmers' perceptions of groundwater sharing and community prosperity. The basic information on the selected social, economic and demographic variables show that the land area (bighas) owned by farmers ranges from 1 to 50 with a mean value of 10.7. The sample respondents consist of medium size households (mean = 2.251), medium annual income (mean = 2.433) and middle to old age farmers.

As can be seen from the equations (1) and (2), a positive value of the coefficient means that an increase in the explanatory variable increases the ranking of outcome and thus, increases the probability of the farmer to express lower satisfaction toward the fair share of groundwater in the community and a negative value of the coefficient decreases it, that is, the farmer is more likely to express his/her satisfaction towards fair share of groundwater and community prosperity.

Table 4: Descriptive Statistics

Variables	Number of Observations	Minimum	Maximum	Mean	Standard Error
Groundwater sharing	150	1	4	1.650	0.0420
Community prosperity	150	1	4	2.270	0.0860
Education	145	1	4	2.551	0.05948
Caste	150	1	2	1.160	0.03003
Total land area (bigha)	150	1	50	10.70	0.64240
Dairy animals (no.)	150	1	16	1.000	0.16000
Income (Rs per year)	150	1	3	2.433	0.04674
Age (years)	150	1	3	2.706	0.42880
Household size	139	1	3	2.251	0.05012

Source: Field Survey, 2004.

Table 5 reports ordered-probit estimates for two econometric models used to measure the groundwater sharing and prosperity of the community. The econometric models are fairly good regarding statistical significance.

None of the social variables is statistically significant. However, a negative coefficient of low and medium education and caste variables suggests that individuals who have attended primary, secondary and high school tend to indicate that groundwater is share fairly in the community. Households who belong to an upper caste also shared similar views (Table 5).

One of the three economic variables has significant influence on the extent of fair share of groundwater and overall prosperity of the community. The economic variable, total landholding, suggests that, households who enjoy large landholding are more likely to 'agree' that groundwater is shared fairly in their community and that their community has prospered in the last five years. None of the other economic variables are statistically significant. Households with low incomes are more likely to indicate that groundwater is shared fairly than their counterparts.

Considering the demographic variables, middle aged households appear to have a statistically significant impact on fair sharing of groundwater in the community. This indicates that households aged between 35 and 49 years are more likely to say that groundwater is shared fairly. This may be because young households are not much experienced in farming and are less aware of how the groundwater has been shared between farmers in the community. Small families are more likely to 'agree' that their community has prospered in the last five years (Table 5).

Table 5: Ordered-Probit Estimation Results

	Dependent Variables	
Independent Variable	**Fair Groundwater Sharing**	**Prosperity of the Community**
Social		
No education	0.271 (0.641)	0.481 (0.548)
Low education	-0.701 (0.529)	-0.263 (0.445)
Medium education	-0.363 (0.491)	0.138 (0.416)
Caste	-0.264 (0.358)	-0.060 (0.301)
Economic		
Total land area (bighas)	0.033 (0.016)**	0.032 (0.014)**
Dairy animals (no.)	-0.031 (0.063)	-0.054 (0.053)
Low income (Rs)	-0.331 (0.619)	-0.518 (0.509)
Medium income (Rs)	0.128 (0.266)	0.002 (0.225)
Demographic		
Young age	-0.295 (0.657)	0.466 (0.547)
Middle age	-0.685 (0.297)**	-0.116 (0.239)
Small families	-0.777 (0.513)	-0.988 (0.435)**
Medium size families	-0.109 (0.255)	-0.100 (0.218)
d_0	0.194 (0.631)	-0.792 (0.544)
d_1	3.340 (0.777)***	0.407 (0.542)
d_2	-	0.750 (0.544)
Observation	135	135
Pseudo-R^2 (Nagelkerke)	0.16	0.13
LR Chi-square	16.9*	16.5*

Notes: The table presents the results of an Ordered-probit equation where the dependent variables are ordered from 1 to 2 (1 to 3). The figures in parentheses are standard errors. For the coefficients above, *, **, *** indicate statistical significance at 15 %, 5 % and 1 % levels respectively. The d_0, d_1 and d_2 are thresholds (or intercepts) estimated along with coefficients. The test of parallel line for measured fair groundwater sharing is significant. 1 bigha = 0.24 hectare.

Although social variables, like the education level of the farmer and caste, do not have any significant impact on farmers' perceptions of groundwater sharing and community prosperity, the negative value of the coefficient of low education (see Table 5) suggests that people with low education are more likely to be associated with farming and hence, they perceive fair share of groundwater and prosperity of

the farming communities in the region. Though the coefficient is not statistically significant, it is an interesting result, and has some implications. Some of the implications are that high education for the household may open up opportunities for educated individuals outside the farming village, making them both less dependent on farming activities and less involved in agriculture. As Agrawal and Gupta (2005: 1108) point out, better access to education and greater use of educational opportunities by households can have the possibility of improving their socio-economic status.

The marginal effect of variables on performance of tubewell partnerships tells us that a marginal increase in landholding increases the probabilities associated with 'strongly agree' to the statement 'groundwater is shared fairly in the community' by 0.019 and to the statement 'the community has prospered in the last five years' by 0.018 (see Table 6). This tells us that farmers with large landholdings have the opportunity to irrigate a big chunk of their land and reap the benefits of tubewell partnerships.

Table 6: Marginal Effects of Predictors on Dependent Variables

Predictors	Fair Sharing of Groundwater			Community Prosperity		
	$\frac{\partial[y=0]}{\partial x}$	$\frac{\partial[y=1]}{\partial x}$	$\frac{\partial[y=2]}{\partial x}$	$\frac{\partial[y=0]}{\partial x}$	$\frac{\partial[y=1]}{\partial x}$	$\frac{\partial[y=2]}{\partial x}$
Social						
No education	0.161	-0.161	0.001	0.267	0.483	0.361
Low education	-0.416	0.416	-0.003	-0.146	0.897	-0.197
Medium education	-0.215	0.215	-0.001	0.077	0.674	0.104
Caste	-0.157	0.157	-0.001	-0.034	0.784	-0.045
Economic						
Total land area (bighas)	0.019	-0.019	0.000	0.018	0.733	0.024
Dairy animals (no.)	-0.018	0.018	-0.000	-0.030	0.781	-0.040
Low income (Rs.)	-0.196	0.196	-0.001	-0.288	0.980	-0.389
Medium income (Rs.)	0.076	-0.076	0.000	0.001	0.750	0.001
Demographic						
Young age	-0.175	0.175	-0.001	0.259	0.492	0.350
Middle age	-0.406	0.406	-0.003	-0.064	0.815	-0.087
Small families	-0.461	0.461	-0.003	-0.549	0.990	-0.742
Medium size families	-0.065	0.065	0.000	-0.055	0.806	-0.075

Notes: (i) Marginal effects reported are computed at holding the independent (predictor) variables at their mean values. (ii) Fair Groundwater Sharing [y = 0: strongly agree; y = 1: agree; y = 2: neutral] (iii) Prosperity of the Community [y = 0: strongly agree; y = 1: agree; y =2: neutral]

A marginal increase in middle-aged farmers increases the probabilities associated with 'agree' to the statement 'groundwater is shared fairly in the community' by 0.406 and to the statement the community has prospered in the last five years' by 0.815. (see, Table 6). Similarly, a marginal increase in small households decreases the probability associated with 'strongly agree' to the above statements by 0.461 for fair sharing of groundwater and 0.549 for community prosperity. However, it increases the probabilities associated with 'agree' to the above statements by 0.461 and 0.990 respectively. This suggests that small households which are members of tubewell partnerships are optimistic that groundwater is shared fairly and that their community has progressed over a period of five years.

Relationship between Attitude to Community Prosperity and Social Capital

Table 7 presents the results from the logit regression analysis of the likelihood of *high prosperity of the community* as compared to *low prosperity*. The logit model appears to strongly indicate the probability of high community prosperity. Generally, the variables used in the model are significant and the likelihood of correctly predicting the high prosperity (as compared to low) using the model is 85.6 per cent.

The logit model results show that farmers who have high social capital in terms of 'trust' in the formal organisations like the legal system, central administration (i.e., national government) and state (provincial) government are more likely to indicate community prosperity in the region. Farmers having a high score for factor 1(trust) significantly increase the probability of correctly predicting the community's prosperity to 2.544 (see Table 7).

When examining the impact of factor 2 — which represents, firstly, accepting individuals as members of the community, and secondly, trusting community members — it is negative, but the coefficient is not statistically significant.

The impact of factor 3, which represents *high trust* in the water authority (irrigation department) and local government (village *panchayats*) is positive. This suggests that people with high trust tend to say that their community has prospered well. High trust in the water authority and local government significantly increases the probability of high community prosperity to 2.159 (see Table 7).

Factor 4, which represents heterogeneity in social groups (differences in age, education and family size), young and middle-aged farmers, small and medium-sized families, and low level of education, has a positive effect on high community prosperity. This is not statistically significant. Nevertheless, the probability increases to 1.408.

Table 7: Logit Regression Results for Community Prosperity

Predictors	**All-Sample**	
	β coefficients	**Exp (B)**
Factor 1	0.934***	2.544
	(0.383)	
Factor 2	-0.388	0.679
	(0.292)	
Factor 3	0.769‡	2.159
	(0.514)	
Factor 4	0.342	1.408
	(0.344)	
Factor 5	-0.444‡	0.642
	(0.301)	
Factor 6	-0.559‡	0.572
	(0.380)	
Constant	2.213***	9.139
	(0.430)	
Log-likelihood	65.28	
Pseudo-R^2	0.28	
Model χ^2	16.89***	
N	104	
Overall Correct Prediction (%)	85.6	

Notes: *** = significant at 1 percent; ** = significant at 5 percent; * = significant at 10 percent; ‡ = significant at 15 percent; Exp (B) = the effect of factor on probability of Y; b coefficient = the effect of factor on log-likelihood of Y; Figures in the parentheses are standard errors.

Factor 5, represents heterogeneity in differences in income and castes. This factor has a negative and significant impact on high community prosperity. The probability is < 1 (0.642). Finally, factor 6 represents *general trust***.** Contrary to our presumption that general trust increases the probability of high prosperity of the community, the results show that it has a negative effect. However, it is not significant.

Conclusion

This paper began with the research questions: What are farmers' attitudes to the way groundwater is shared in a self-organised collective tubewell ownership? Whether farmers perceive that their community is prospering? Do social; economic and demographic characteristics of the farmers affect these subjective perceptions? The result demonstrated that a reasonable number of farmers perceived that

groundwater is shared fairly and that their community has prospered in the last five years. When examined if at all social, economic and demographic attributes of the farmers had any impact on their perceptions, it became evident that of the three economic variables, one (size of the landholding) had significant impact. What this means is that large farmer tend to indicate their satisfaction towards groundwater sharing and community prosperity. As for the demographic variable, young farmers (aged between 18 and 34 years) are less likely to be optimistic about fair sharing of groundwater. Small households/families have not realised the benefits of collective ownership of tubewells in Mehsana. Their plight appears to linger. The heterogeneity with respect to caste has no significant impact on their perceptions. Although farmers' education levels do not have significant influence on their perceptions, it suggests that people with access to better education may not be involved in irrigated farming. This was also observed during our field visit, as many well-educated household members had gone overseas for better income-earning opportunities.

The differences in perceptions of fair share of groundwater in a self-organised collective tubewell ownership are reflected in terms of economic and demographic characteristics of the farmers. This study indicates that larger farmers may be reaping the benefits of collective tubewell ownership more than small farmers. Although farmers have self-organised to fill the policy-vacuum (lack of groundwater regulation), it appears that not everyone is satisfied with the way the groundwater resource is shared. Policies to encourage small and marginal farmers should take priority.

An examination of the relationship between dependent variables such as fair share of groundwater and community prosperity in a collective tubewell partnerships context in Mehsana, has brought out the presence of social capital in terms of high trust in the formal organisations and trust in the water authorities, viz. Irrigation Department officials, and its positive influence on attitudes to fair sharing of groundwater and community prosperity. This is an important observation from the perspective of involving government officials in devising institutional arrangements to help farmers in accessing water resources for irrigation.

Small and marginal farmers should be encouraged to form water users' cooperatives to access groundwater fairly. For this purpose, the government may consider providing credit access to these less affluent farmers for financing their tubewells and pumps. Joint ownership of tubewells with exclusively small and marginal farmers as its beneficiaries would help these farmers acquire rights to groundwater and increase their economic well-being.

The econometric model seemed reasonably good in investigating the research questions and theoretical assumptions regarding the effect of 'objective' socio-economic and demographic characteristics of the farmers on perception-based attitude to groundwater sharing and community prosperity in the region. However, in the light of cross-sectional data collected from a single time period, the

possibilities of the same trend cannot be ruled out. Future studies can focus on including more independent variables to examine the relationship between farmers' perceptions of fair sharing of water and improvements in their social and economic well-being in the society. This would open up a new research paradigm for economists and development scholars.

Notes

[1] Groundwater can be considered a common pool resource because: it is difficult to exclude any individual well-owner withdrawing groundwater from the same aquifer; and the extraction and use of groundwater resource by one farmer means that the quantity of groundwater available to neighbouring farmer(s) is reduced.

[2] The attitude to community prosperity can be an indicator of economic well-being of the farm households. Although this study does not measure the physical assets or resource endowments owned by the sample farmers, it is presumed that the farmers express their well-being honestly, if at all there is any improvement in their family status (especially, economic status).

[3] The rationale for considering the last five years is that, if at all there is a welfare improvement among groundwater users depending on the groundwater resource for the major portion of their irrigated agriculture, then this is assumed to be translated *de facto* in the recent years.

[4] We used standard trust-related questions. The response was measured on a scale of 0 to 5 with 0 = strongly agree, and 5 = strongly disagree to the statements "how much confidence do you have in the following: legal system; central administration; state government; local government; and police.

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Estimation of Technical Efficiency in the Stochastic Frontier Production Function Model - An Application to the Coffee-Based Mixed Cropping System

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Abstract

Technical efficiency of coffee and inter crops is measured through the estimation of a stochastic frontier production function using the data for the year 2003-04. Variation in technical efficiency index across production units is explained through a number of managerial and estate characteristics variable that ranged from 41 to 98 per cent. The study has observed a positive influence of labour mandays, fertiliser applied, expenditure and plant protection chemicals on yield of coffee and its inter crops. The results indicate fairly high Mean Technical Efficiency for coffee estates at 86 per cent of the frontier yield. The coffee growers have recorded higher technical efficiency (96 per cent) for inter crops such as pepper and orange.

Introduction

Coffee is the most popular beverage in the world and contributes significantly to the national economy of India. Indian coffee accounts for 3.83 per cent of the global output, cultivated in about 3.5 lakh hectares of land. Karnataka, Kerala and Tamil Nadu are the leading states in the country producing 2,92,400 tonnes of coffee with a productivity of 891 kg/ha *(Source: Database on Coffee, May 2004, Coffee Board)*. India accounts for less than 5 per cent of global coffee output and trade. India has almost doubled its coffee production between 1951 and 2003 but is not in a position to improve its share in the world coffee trade. This has necessitated an analysis of the productivity efficiency in coffee, particularly of the small and medium planters.

In agri-business, efficiency is an important factor contributing to productivity growth as well as stability of production. The coffee economy can

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benefit to a great deal from efficiency studies to decide whether to improve technical efficiency (and/or) to develop new technology to increase coffee productivity. The main objective of the study is the analysis of decision-making processes in coffee-based mixed cropping system by understanding the technical efficiency using a stochastic frontier production function.

Review and Methodology

Frontier production function represents a maximum possible output for any given set of inputs setting a limit (or) frontier on the observed values of dependent variable in the sense that no observed value of output is expected to lie above the production function. Any deviation of a farm from the frontier indicates the extent of the farm's inability to produce maximum output from its given sets of inputs and hence represents a degree of technical inefficiency (Hazarika and Subramanian 1999). A one-sided component captures the effects of inefficiency relative to the stochastic frontier. In literature, efficiency can be measured with respect to the normatively desired performance of a farm with that of any other farm. Thus, the efficiency measures are computed basically by comparing observed performance with some specific standard performance (Shanmugam 2000). Farrell (1957) employed a deterministic approach in which a cost frontier was estimated using linear programming (LP), requiring all observations to lie on or above the frontier. Later, Aigner and Chu (1968) translated Farrell's cost frontier into a production frontier, since outlier observations under a deterministic approach seriously affected the problem, by using a probabilistic frontier function. This approach deletes outlier observations, one at a time, to avoid spurious errors due to extreme observations, until the resulting estimated coefficients stabilised. Timmer's (1971) approach yields a frontier, which is probabilistic rather than deterministic or stochastic. It forces all observations to be on or below the production frontier so that all deviations from the frontier are attributed to inefficiency and the others representing the usual random noise. This method has the advantage of separating the farm-specific efficiency and random error effect**.** Aigner *et al* (1977) then developed a stochastic frontier model. The technical efficiency in production was independently proposed to measure technical efficiency by Aigner *et al* (1977) and Meeusen and Van Broeck (1977). The estimation of stochastic frontier production made it possible to find out whether the deviation in technical efficiency from the frontier output is due to firm specific factors or due to external random factors. A large number of studies are available on the use of stochastic frontier for the measurement of technical efficiency in production. A number of comprehensive literature reviews are also available such as Mythili and Shanmugam (2000), Tim Coelli *et al* (2002) and Shanmugam (2003).

Measurement of technical efficiency has been attempted across crops such as rice (e.g., Kalirajan and Shand 1994; Mythili and Shanmugam 2000), tea (e.g., Hazarika and Subramanian 1999), rice, groundnut and cotton (Shanmugam 2003). There have been few attempts to measure the efficiency of plantation crops. In this study, we employ the stochastic frontier methodology for coffee, orange, banana and pepper. This methodology has certain advantages over the estimation approach followed by the earlier studies. For instance, it accounts for random factors that are outside a firm's control (such as crop diseases, flood and weather) which significantly affect their technical efficiency.

This study has used farm-level panel data on yield, area, and utilisation of resources from 75 small and medium coffee estates where holdings are less than 5 acres. Based on snowball sampling techniques, 75 respondents were identified to meet the objectives of the study. In Tamil Nadu, Dindigul district was purposively selected since it was the leading coffee-growing district. This district had 15,068 ha of land under coffee of the total 30,681 ha of coffee in Tamil Nadu. The sample farmers cultivated multi-species intercropped with coffee and other intercrops, like orange, pepper, banana and vegetable crops (beans and lab lab). The data related to the inputs and output details of farm households distributed in various regions of Palani hills of the Dindigul district for the year 2003.

Cobb-Douglas production function was used to estimate the resource use efficiency.

$$\ln Y = 1\beta_0 + \beta_1 \ln A + \beta_2 \ln L + \beta_3 \ln F + \beta_4 \ln P + U_i$$

Y = Coffee/inter crops yield in kg per acre,
A = Area under plantation in acres,
L = Labour used in mandays per acre,
F = Fertiliser applied (N+P+K kg per acre),
P = Expenditure on plant protection chemicals (Rs per acre),
β = Intercept
$\beta_i + \beta_5$ are production elasticities.
U_i = Error term

Results

Tables 1 and 2 report the mean and standard deviation of variables used in the empirical analysis. Table 1 illustrates the information on minimum and maximum yield distribution. The coefficient of variation for intercrops such as orange and pepper was higher compared to the main crop of coffee. Similarly, Table 2 gives basic details on yield, resources (land and labour), utilisation of inputs (FYM, fertiliser, chemicals), usage pattern for coffee, orange, banana and pepper.

Table 1: Yield Distribution of MCS Crops

MCS crops	Minimum	Maximum	Mean	Standard Deviation	Co-efficient of Variation
Coffee (in kg)	105	650	401.03	89.12	0.22
Orange (in nos)	5,000	85,000	36,342.17	19,699.87	0.54
Pepper (in kg)	120	2,000	1,042.5	706.98	0.68
Banana (in nos)	12,000	120,000	46,786	22,769.15	0.49

MSC refers to Mixed Cropping System

Table 2: Details of Yield and Input Use Pattern in Coffee and Intercrops of Sample Households

Variables	Coffee		Orange		Banana		Pepper	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Main output (kg/nos.)	401.03	89.12	36,342.17	19,699.87	46,786	22,769.15	1,042.50	706.98
Land under crop (ac)	4.023	2.96	2.74	2.35	2.55	2.3116	2.17	1.80
Labour (Mandays)	142.11	39.38	96.97	16.52	-	-	52.68	13.67
FYM (in Rs.)	-	-	836.81	857.22	416.67	28.87	804.52	434.43
NPK (in kg)	60.56	22.24	64.94	27.89	-	-	105.39	445.26
Plant protection chemicals (in Rs.)	963.78	537.68	3,646.47	2,250.46	1,803.9	5769.20	1,456.25	2,650.76

Table 3: Estimates of Production Function in Coffee-Based MCS

Variables	Definition	Coffee	Orange	Banana	Pepper
$ß_0$	Constant	1.4497**	9.9954*	7.1885*	5.4377**
		(0.6220)	(0.9252)	(1.0031)	(2.2809)
LnA	Area	-0.0074	0.1174**	-0.0314	-0.4088**
		(0.03285)	(0.0567)	(0.1105)	(0.2303)
LnNPK	Fertiliser	0.2555*	0.0464	-	0.01299
		(0.2303)	(0.1117)		(0.2015)
LnLRMD	Labour man-days	0.3184*	-0.2254	0.4105**	0.2144
		(0.0914)	(0.1603)	(0.1787)	(0.5896)
LnPP	Plant protection chemicals	0.2487*	-0.1175	0.0005**	-0.00001
		(0.0677)	(0.1046)	(0.0003)	(0.0003)
LnFYM	Farm yard manure	-	0.3279	0.2942*	0.0005
			(0.0498)	(0.0926)	(0.0004)
N		78	59	42	34
R^2		0.4457	0.5817	0.3168	0.1715

Figures in parentheses indicate standard errors. MSC refers to Mixed Cropping System.
* indicates one per cent significant level. ** indicates five per cent significant level

A. Empirical Results

Estimates of Cobb-Douglas production function for coffee-based Mixed Cropping System in Dindigul district have been presented in Table 3. The co-efficient of multiple determination (R^2) for coffee was 0.4457 indicating that 45 per cent of the variation in coffee productivity had been explained by the explanatory variables included in the model. Among the explanatory variables, fertiliser applied (in kg), labour mandays, expenditure on plant protection chemicals had a positive and significant influence on the productivity of coffee. The co-efficient for fertiliser was 0.2555 implying that one per cent increase in the fertiliser applied would result in 0.2555 per cent increase in total coffee productivity keeping other variables constant at their mean level. Similarly, plant protection chemicals also positively influenced the productivity of coffee. Likewise, the co-efficient for labour mandays was 0.3184. For orange, the co-efficient of multiple determination (R^2) was 0.5817 indicating that 58 per cent of the variation in orange production was explained by the explanatory variables included in the model for coffee-based MCS. Among the explanatory variables, only land area significantly influenced the orange productivity.

For banana, the co-efficient of multiple determination (R^2) was low at 0.3168. Among the explanatory variables, labour mandays, plant protection chemicals and FYM significantly influenced the productivity of banana. For pepper, the co-efficient of multiple determination (R^2) was very low, 0.1715. Among the explanatory variables, only land area significantly influenced the productivity of pepper.

The regression co-efficients in the Cobb-Douglas production function are the production elasticities, and their sum indicates the returns to scale. The estimates of return to scale were much higher and significantly different from unity, indicating increasing returns to scale. This showed that an increase in the use of the selected variables (e.g., application of FYM, fertiliser and plant protection measures) would result in more than proportionate increase in total production of MCS components.

B. Estimates of Frontier Production Function

The estimated value of s^2u and s^2v for coffee were 0.09535 and 0.00063 respectively. These values indicated that the difference between the observed output and frontier output were not due to statistical variability alone but also due to technical efficiency level of the estates. The estimate of discrepancy parameter (θ), the ratio of the variance of firm-specific performance of TE to the total variance of output worked to 0.9934, indicating that 99 per cent of the difference between the observed and frontier output was primarily due to the factors which were under the control of the farmer. The estimated mean TE was 86 per cent, implying that on an average, the sample farmers realised 86 per cent of their technical abilities. Remaining 14 per cent of their technical potentials were untapped which did not require any additional expenditure.

Table 4: Maximum Likelihood Estimates of Production Function Relating to Coffee-Based MCS

Variables	Definition	Coffee	Orange	Banana	Pepper
ß$_0$	Constant	2.8662*	9.9300*	8.2009*	5.3631
		(0.5814)	(1.5704)	(1.6368)	(33.4630)
LnA	Area	-0.0303	0.1174**	0.0683	-0.4088
		(0.0514)	(0.0520)	(0.1404)	(0.2888)
LnNPK	Fertilizer	0.3915*	0.0460	-	0.01271
		(0.0619)	(0.1014)		(0.2902)
LnLRMD	Labour	0.1412	-0.2251	0.3408	0.2143
	man days	(0.0429)	(0.2281)	(0.2697)	(0.6127)
LnPP	Plant protection	0.1399	-0.1181	0.0002	-0.00001
	chemicals	(0.1015)	(0.1193)	(0.0002)	(0.0003)
LnFYM	Farm yard	-	0.3283*	0.2636**	0.0005
	manure		(0.0601)	(0.1308)	(0.0004)
'F' ratio	—	14.08	14.74	4.29	1.16
Log likelihood	—	29.48	1.44	-28.40	-29.93
σ^2v	Random variability	0.00063	0.0532	0.01736	0.33716
σ^2u	Farmer variability	0.09535	0.00704	0.7062	0.00912
$\sigma u/\sigma v$	Variance ratio	12.30241	0.363773	6.378066	0.164467
$8=\sigma^2u/(\sigma^2u/\sigma^2v)$	Discrepancy parameter	0.993436	0.116866	0.976008	0.026337
MTE=1-$\sigma u\upsilon$ $2/\pi$	Mean technical efficiency	0.8609	0.9622	0.6215	0.9569

Figures in parentheses indicate standard errors

* Indicates one per cent significant level

** Indicates five per cent significant level

There were considerable evidences that the observed outputs of all crops were less than their respective frontier outputs due to technical inefficiency (Table 4). The estimated values of discrepancy parameter (θ) were 0.12, 0.98 and 0.03 for orange, banana and pepper respectively. The estimated mean TE values of respective crops were 96.2 per cent, 62.2 per cent and 95.7 per cent, indicating that the sample estates, on an average, could increase the output of orange by 4 per cent, banana by 38 per cent and pepper by 4.3 per cent without additional resources through proper use of technology.

Table 5: Frequency Distribution of Technical Efficiency for Coffee-Based MCS

Efficiency Index (per cent)	Coffee	Orange	Banana	Pepper
1.00-40.00	-	-	7 (16.7)	1 (3.0)
41.00-50.00	1 (1.3.)	1 (2.0)	-	1 (3.0)
51.00-60.00	3 (4.0)	2 (3.0)	4 (9.5)	5 (16.0)
61.00-70.00	17 (22.7)	7 (12.0)	4 (9.5)	2 (6.0)
71.00-80.00	38 (50.7)	9 (15.0)	23 (54.8)	1 (3.0)
81.00-90.00	5 (6.7)	7 (12.0)	3 (7.1)	1 (3.0)
91.00-100.00	11 (14.7)	33 (56.0)	1 (2.4)	20 (65.0)

Note: Figures in parentheses indicate percentage to total

C. Farm-Specific Technical Efficiencies

The farm-specific technical efficiencies were estimated using equation 5 (see Appendix) and the frequency distribution is shown in Table 5. It was found that a majority of the orange and pepper cultivators belonged to the most efficient category (more than 91 per cent) and a majority of the coffee growers (86.1 per cent) operated in 71-80 per cent category, whereas most of the banana farms (62.2 per cent) operated in 70-80 per cent category.

The mean technical efficiency for pepper and orange farms was good and it was low for coffee. Orange grown in these regions is popularly known as "Hill Orange" and has been perceived as having medicinal properties and commands good market and prices. The similar properties and quality of "Hill Pepper" in the region also enhanced its value in the market and its price thereby resulting in higher technical efficiency.

Conclusion

In this paper, we have analysed the technical efficiency in the cultivation of coffee and its intercrops, viz., orange, pepper and banana, by estimating the stochastic frontier production function and farm-specific technical efficiencies.

There are considerable evidences that the observed outputs of coffee-based MCS are less than their potential output due to technical inefficiency. The mean technical efficiency in raising coffee was 86 per cent and for mixed crops it ranged from 62 to 96 per cent. Thus, there is scope for improvement in the productivity of the sample estate, especially with respect to banana and coffee. The existing gap between the realised and potential yield highlights the need for improving planters' technical efficiency through business-led extension services and capacity development programmes.

Appendix

Theory of Stochastic Frontier Model

A (linear) stochastic frontier model is specified as

$$Y = f(X_1, X_2, ... X_n) + (v \pm u) \quad \text{————} (1)$$

Where v is the symmetric error component causing the deterministic part of the production frontier $f(X_1, X_2, ...X_n)$ to vary across the firms. The error term is composite, consisting of random noise and a one-sided residual term (which follows a half-normal distribution). This approach has been extended in various ways, such as specification of more general distributions for the residual term (truncated normal, exponential and gamma), and measurement of technical efficiency using cost and profit functions.

However, individual observation-specific technical efficiency measures are more useful from a policy viewpoint. The approach to identifying firm-specific technical efficiency requires some estimators that allow for separating the effects of the one-sided error term u from the combined effects of u and v using the estimated frontier functions. Therefore, the problem is to predict u_i under the assumption that $u_i + v_i$ is known. The best predictor of an unknown random variable (u_i) under the value of the combined random variables $u_i + v_i$ is the minimum mean squared error predictor given by the conditional expectation of u_i. Assuming a half normal distribution for u_i and normal distribution for v_i, the frontier model becomes

$$Y = f(X_1, X_2, ... X_n) + (v \pm u)$$

where, $u = |u|$ and $u \sim N[0, \sigma^2_u]$

and $v \sim N[0, \sigma^2_v]$

The components of the disturbance term are assumed to be independent and the frontier is assumed to be linear in the above case. (In case of multiplicative models, Y(v-u) component is expressed as exp (v-u)). Now, the firm or observation specific u_i can be estimated as

$$E\{u_i/(u_i + v_i)\} = -\sigma_u\sigma_v/\sigma [f(.)/(1-F(.) - \{(u_i + v_i)/\sigma\}\{\gamma/(1-\gamma)\}^{1/2}] \quad \text{————} (2)$$

where f (.) and F (.) are standard normal density and distribution functions evaluated at

$$\{(u_i + v_i)/\sigma\}\{\gamma/1-\gamma\}^{1/2}, \gamma = \sigma^2_u/\sigma^2 \text{ and } \sigma^2 = \sigma^2_u + \sigma^2_v \quad \text{————} (3)$$

Alternatively,

$$E(u/e) = \sigma\lambda/(1+\lambda^{2})\lambda[f(E\lambda/\sigma)/F(E\lambda/\sigma) - E\lambda/\sigma]$$

where $\lambda = \sigma^2_u/\sigma^2_v$ ———— (4)

The primary advantage of a stochastic frontier production function is that it enables one to estimate $U_i$and, therefore, also to estimate farm-specific technical efficiency, which is equivalent to the ratio of the production of the i-th farm to the corresponding production value if the farm effect U_i is zero.

Various functional forms may be specified for the Stochastic frontier production function, viz., Cobb- Douglas (CD) , Constant Elasticity of Substitution (CES), Translog, etc. However, Cobb-Douglas function form is generally preferred in most published papers on technical efficiency because of its well-known advantages. Its purpose is to show what of a given product will be achieved by different combination of factors. Example, one may need the difference in net value product per unit of land associated with a difference in the amount of labour used per unit of land. In principle, containing the amount to the functional form can be somewhat restrictive. However, it is possible to estimate the stochastic frontier production function using MLE method. Aigner *et al* (1977, p 26) derive the density function for the sum of symmetrical normal random variable (i.e., v), and a truncated normal random variable (i.e., u). In their formulation,

$\sigma^2=\sigma^2 v+\sigma^2 u$ and $Y= \sigma u / \sigma v$

One advantage of estimating the frontier production is that it is possible to find out whether the farmers' deviation of yield from the frontier yield is mainly because they did not use the best practice or technique or due to external random factors. Thus, one can say whether the difference between the actual yield obtained and the frontier yield, if any, occurred accidentally or not.

Following Battese and Coelli (1988), when output is measured in logarithms, the farm-specific technical efficiency can be estimated as :

$$TEi = Exp(-ui) \qquad \text{——————} (5)$$

$i = 1,2,3\ldots\ldots n, 0 < TEi < 1$

The variance ratio Υ, explaining the total variation in output from the frontier level of output attributed to technical efficiencies, can be computed as:

$\Upsilon=\sigma^2 u/\sigma^2 v$

where $\sigma^2=\sigma^2 v+\sigma^2 u$ and $0< \Upsilon<1$

Υ has two important characteristics:

1) When $\sigma^2 v$ tends to zero, then u is the predominant error in equation (1); and $\Upsilon \rightarrow 1$. This implies that the output of the sampled farmers differs from maximum feasible yield mainly because of differences in technical efficiency.
2) When $\sigma^2 u$ tends to zero, then the symmetric error v is the predominant error in equation (1), so $\Upsilon \rightarrow 0$. Thus, based on the value of Υ, it is possible to identify whether the difference between a farmer's output and the efficient output is principally due to statistical errors ($\Upsilon \rightarrow 0$), or sample's less than efficient technology ($\Upsilon \rightarrow 1$).

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Book Reviews

Ragini Sen. *We the Billion: A Social Psychological Perspective on India's Population.* New Delhi: Sage Publications. 2003. Pp. 323. Rs. 480 (Hardback).

India's one billion population and its demographic diversity have always received wide attention from scholars, as it is a subject of interest not only to social scientists but also to politicians, media and the informed general public. Even at the international level, demographers have shown special interest in and concern for population growth and the policies of India, a country consisting of one-sixth of the world population today. India is the first country in the world to formulate an official family planning programme, as early as 1952. How far have we been able to achieve the set goals and meet the population challenges during the last five decades? What are the social, economic and cultural factors which influence the population growth and the adoption of contraception? Why do the debates on fertility differentials by religion in India always assume communal and political dimensions? Why are our national political leaders shying away from taking hard decisions to check the population growth? What can be done to narrow down the increasing gap between southern and northern states in terms of demographic transition?

The large volume of research on India's family planning programme and fertility behaviour undertaken by both Indian and western scholars has provided very interesting insights. Many of those studies have very convincingly proved that the interplay among the social, economic and political factors together determine the fertility preferences of an individual or community in the Indian context. One issue that continues to receive considerable attention in the development discourse of India is the fertility behaviour and population changes across states and regions. The book by Ragini Sen provides an interesting discussion on social and psychological dimensions of population growth, fertility patterns and gender discrimination. According to the author, "the fertility behaviour is a supra individual issue and cannot be treated on an isolationist basis". In a country known for its heterogeneity and demographic diversity, there exist significant regional disparities in terms of demographic and health indicators. Many factors -- including poverty, poor literacy, low age at marriage, inadequate health infrastructure and low level of utilisation, strong preference for sons and low status of women -- are mainly responsible for the alarming growth of India's population. To a large extent, successful control of population growth in India depends upon our sincere effort in spreading literacy, improving the status of women, providing social security measures and creating awareness about the advantages of small family norm among the rural masses.

In this situation, the author identifies important issues of concern and also emphasises the urgent need for a new approach to understand the underlying "social forces" which influence the fertility behaviour. Special treatment has been given in this book to the problems related to the decline in child sex raito, infanticide and sex-selective abortion, female literacy, politicisation of fertility variations and the spreading menace of dowry practice. The slow fertility transition of our largest populated state of Uttar Pradesh, "the fertile womb of India", has received special attention in the book.

The 2001 census highlights one alarming trend in the decline of child sex ratio (0-6 years) in many Indian states. The strong 'son preference', an outcome of economic, social and cultural factors, is still existing in India, and the availability of modern medical technology at the doorsteps of the people makes it possible for the couples to choose the sex of the baby. This has resulted in the large-scale elimination of girls during pregnancy and even after birth. The phenomenon of "missing girls", as pointed out by Amartya Sen years ago, has taken new dimensions and a threatening proportion, if we go by the results of the last census. As social norms are changing towards small families, the availability of and access to new reproductive technology provide an easy way for parents to achieve the desired sex composition and the desired small family size. Amartya Sen has called it a "technological revolution of a reactionary kind". The root cause of this malaise lies in the widely held notion of a "daughter being a liability" and a son being considered "an asset and a source of old age security". Does a strong 'son preference' ultimately result in deliberate discrimination against daughters? Interestingly, the economically better-off states and prosperous urban centres record the drastic decline in the child sex ratio during the last decade. For many couples from affluent families, if it is one child, it should be a boy. This recent phenomenon as narrated by the author needs to be studied more carefully and systematically.

Ragini Sen also emphasises on the important role of media and public opinion on population issues. She states that creating awareness among the public and removing apprehensions among certain sections of population are two priority areas. Unfortunately, the lack of political will to face the "fertility issue" is a major hurdle in this country. Though many states have come forward with state-specific population policies, very little has been done to achieve the goals. Every political party conveniently avoids the issue of family planning and takes refuge under the hope that "development is the best contraceptive". However, the 2001 census has indicated that after a large spell of unprecedented population growth, the country has been experiencing a gradual decline in fertility levels. There is also evidence of a growing disparity between southern and northern states with the former having been more successful in controlling population growth.

The book also discusses in detail the adverse impact of dowry system on the status of women and the vulnerability of parents having daughters The evil of

dowry system, which has in recent decades spread among all castes and classes, has emerged as a strategy to acquire high standards of material life, status and security. Even after 40 years of its prohibition by the government, the dowry malaise has been spreading and it now inflicts many communities where it was unheard of before. Many studies have indicated that dowry is the major cause of unwantedness of daughters and increasing domestic violence against women in India.

This book by Ragini Sen, with descriptive analysis alongside facts, figures and messages, provides an interesting reading. The arguments will make a significant addition to the ongoing debate on addressing the population issues which are more of a "human aspect" rather than a statistical problem. The author is successful in highlighting the gender dimensions of India's population problem in a lucid and thought-provoking manner and deserves to be complimented.

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Bradley Louis Glasse. *Economic Development and Political Reform: The Impact of External Aid on the Middle East.* UK: Edward Elgar Publishing. 2001. Pp. 147.

The geostrategic significance of the Middle East has made it an international focal point as external powers have competed for presence and power, for influence and control, and for access to resources and to markets through the region. Bradely Louis Glasser's book *Economic Development and Political Reform* is a major contribution to the literature on Middle Eastern political economy.

The study attempts to fill the intellectual gap by examining the ways in which Middle Eastern regimes have used controlled parliamentary politics to reinforce their economic development models. The author contends that economic conditions and policies have often shaped the political liberalisation process in the region.

The study focuses on Turkey, Morocco, Egypt and Kuwait and also covers important political developments in other middle-eastern countries that occurred in the 1980s and 1990s. It is argued that much of the region has experienced a political crisis or stagnation during the last 20 years and absence of substantial exogenous revenues, including oil and foreign aid, was the major reason. The regimes that have faced fiscal crisis have been forced to pursue neo-liberal political and economic strategies while those states commanding significant exogenous resources have tended to be late and weak reformers.

It is explained that the external capital has had a decisive impact on economic and political developments in the region. The region includes a number of ethnic and linguistic groups, varying socio-economic achievements and systems, and a range of international alignments.

Further, the structure of state revenue has shaped the development of parliamentary coalitions. Rent-poor states seem to exercise little choice but ally with a center-right bourgeoisie that plays a vital role in the neo-liberal economic reform programme. Rent-rich regimes have avoided this strategy, preferring to maintain their alliances with more diverse social groups, particularly popular sectors.

In the Middle East of the 1980s and 1990s, the driving force behind the adoption of neo-liberal orthodoxy has been the foreign exchange crisis. States experiencing such crises have been inclined to undertake economic reforms to maintain solvency and avert economic collapse. States with access to exogenous revenues – particularly those that do not flow from the multilateral financial institutions such as the World Bank and IMF – have been better able to avoid foreign exchange crises and therefore have been less inclined to implement liberal reforms. Regimes in Morocco, Turkey, Egypt and Kuwait all staged landmark political openings during the 1980s. Rent-poor Morocco, Turkey and Tunisia favoured electoral coalitions espousing neo-liberal economic policies, whereas rent-dependent Egypt developed a more populist parliamentary constellation and oil-rich Kuwait installed groups calling for even more expansionary and heterodox economic programmes. Each regime, through political liberalisation, apparently sought to legitimate a distinctive development model.

The author argues that Middle Eastern electoral experiments of the 1980s and 1990s aimed increasingly at installing a centre-right bourgeoisie because of two factors. First, the decline in import-substitution industrialisation (ISI) throughout the Third World, and the concomitant rise of an orthodox macroeconomic consensus among the global creditors have shaped openings in the developing world. Second, in the case of the Arab states, the oil glut of the 1980s has decreased the level of exogenous rents available to the regimes, both by decreasing the profitability of petroleum industries and by staunching external aid flows within the region. Thus, the oil glut and crisis in Third World ISI models have pushed most rent-poor regimes in the region to recast the tenor of political life.

In the *'minimally rentier'* states such as Turkey and Morocco, exogenous revenues comprises less than 20 per cent of state revenues in the two years preceding the political openings. These countries faced serious economic crises and resource gaps during the late 1970s and 1980s, and were forced to embrace the neo-liberal policies of international donors and creditors. In turn, each regime designed an electoral system that blatantly favoured centre-right bourgeois groups, thus enabling them to dominate parliament.

Further, in Morocco and Turkey, economic crisis and low levels of

exogenous rents ultimately meant that bourgeois groups in parliament were able to make strident appeals for macro-economic orthodoxy. These groups exploited available opportunities by appealing for 'capitalist' and 'technocratic' polices – for example, privatisation – that served their interests. Since their interests coincided with the perceived 'accumulation' requirements of the regime, these groups were given an ascendant position in the electoral political system.

The '*semi-rentier'* state of Egypt had exogenous revenues of roughly 45 per cent of total revenue during the 1980s. Exogenous resources allowed Egypt to postpone its substantive official reform programme until the early 1990s. It was able to use exogenous rents to forestall the blatant favouring of bourgeois groups in the electoral-political system. In sum, the regime preserved its 'centre-left' parliamentary predominance and used center-right bourgeoisie position in parliament to portray itself as a protector of the popular sectors. By the end of the 1990s, access to exogenous revenues still conditioned the overriding development trends in the Middle East. Arab countries receiving high marks from the IMF – Morocco, Tunisia, Jordan and Egypt – tended to be those commanding the lowest levels of non-conditional finance. Turkey emerged as a model during the early 1980s, in terms of the degree of consistency that the policy makers achieved in the implementation of the structural adjustment programme.

The book drives at the point that the democratic Turkish regime was less able to dictate the results of the electoral process than were the relatively authoritarian Arab ones. In the Arab cases, the regimes were successful in installing their preferred party or faction. The Turkish regime succeeded in conducting a poll that protected its orthodoxy development programme, though it did not succeed in installing the party it had created. Nevertheless, the Turkish military was able to improve the parliamentary interests of an upper class and a pro-orthodox centre-right in general. In this sense, the Turkish regime, like the Arab ones, did succeed in its redesign of the polity. The author argues that Egypt reforms were extremely limited and at times purely cosmetic. An unprecedented level of foreign aid dictated the Egyptian embrace of neo-liberalism in the 1990s. Unlike Jordon and Morocco, Egypt has not experienced the emergence of vigorous parliamentary competition.

The book has not evaluated the pros and cons of neo-liberalism. But the analysis provides contradictions between political and economic reforms in the Middle East. The book deserves to be read by political scientists and economists, particularly those specialising in the Middle East political economy.

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Ponna Wignaraja and Susil Sirivardana (eds). *Pro-Poor Growth and Governance in South Asia: Decentralization and Participatory Development.* New Delhi: Sage Publications. 2004. Pp. 459. Rs. 420.

Since the early 1990s, the pursuit of good governance has become a fashionable catch phrase with many countries attempting to achieve some measure of it through institutional reforms aimed at restructuring their governance process. That good governance is an essential ingredient for development is not deniable. However, while good governance entails greater transparency, accountability to stakeholders and openness in government organisations, there are variations in its approaches and the manner it is perceived. One perspective is that good governance is a means for economic growth and social transformation with prominence being given to the 'development state' as a positive force (like the performance exhibited by the newly industrialising economies in East and South-East Asia). Others emphasise the opportunities it presents for development-oriented governance through increasing participation in decision-making and resource allocations, especially for the poor. The popularity enjoyed by decentralisation in the past decade or so as a model for public sector reform and as a general development strategy is essentially a response to this prognosis of governance as an informed, pluralistic and involved society. Poverty reduction is the other focal point of this governance perspective.

In theory, decentralisation – in the sense of devolution of power to local agencies – brings many benefits: it improves allocative efficiency, it increases rates of cost-recovery; and it improves matching between the supply of public services and local preferences. It is also seen as a means for poverty reduction. However, the limited empirical evidence that exists does not in general corroborate these theoretical findings. While decentralisation is a reality in many developing countries, even after decades of endeavours, the experience with decentralisation has been rather mixed, and the expectation that it will empower the local poor and lead to better growth and development outcomes has often remained unfulfilled.

It is in this context that this book, edited by Ponna Wignaraja and Susil Sirivardana, makes its particular contribution. Involving contributions by experts, the book attempts to systematically bring together the complementarity of the agendas centred on governance, poverty reduction, and decentralisation. It recognises that the governance agenda, with emphasis on participatory development, can be combined with decentralisation of powers and resources to local governments to lay the basis for poverty reduction. Drawing on case studies on decentralisation experiments taking place in the countries of the subcontinent – Bangladesh, India, Nepal, Pakistan and Sri Lanka – the book argues that the key to

the process is community mobilisation through social movements and local development organisations that can catalyse change in partnership with state organisations and a socially responsive private sector. The contributors to the book see a new political space for this in the current attempts at decentralisation.

The book illustrates this possibility through six case studies. Demonstrating different models in localised contexts, the case studies bring out commonalities and differences of the link between pro-poor growth, decentralisation reforms and poverty eradication that can lead to good governance processes and practices. Covering both rural and urban experiences, the cases show a movement towards the participatory paradigm and the establishment of partnerships between state and development actors.

The Kerala model, written by Madhu Subramanian, is a case of initiating participatory development in a very "mobilised and organised welfare-oriented state" and illustrates "ideologically oriented and party-led planning and service delivery" where people are an "add-on" to a largely top-down process. The Gujarati model by Amitabh Kundu and Debolina Kundu is another case from India. It illustrates "capitalism under non-classical conditions" with urban local government institutions forming strategic partnership with the private sector to improve their managerial capability and resource position, and bringing in environment concerns into urban development.

The Pakistani model by Arif Hasan and Salim Aleemuddin, on the other hand, provides a case of strong self-reliant organisations of the poor that operate as "countervailing power against an unwilling and unresponsive state system" and also limit damages from negative development interventions because of consciousness and awareness of the poor.

The Sri Lankan model by Susil Sirivardana is a case where an elitist bureaucratic and technocratic top-down centralised delivery strategy was opted and which has continued to date, although choices for participatory democracy were available. The case illustrates a positive micro-macro link in the restructuring of the polity.

The Nepali model written by Srikrishna Upadhyay and Govinda Koirala demonstrates the "rich functional layer of decentralisation" that is present in traditional Nepali society and how pro-poor growth could be achieved through effective social mobilisation.

The last case in the book illustrates the Bangladesh model, written by Shaikh Maqsood Ali. Citing the 'village development from below' approach that is being reinforced by the micro-credit experiments of the Grameen Bank and various non-governmental organisations, the case gives an indication of how the poor are demonstrating their readiness for becoming "subjects" as opposed to "objects" of development in Bangladesh.

Arising from the use of the methodology of social mobilisation and participation, the book postulates an emerging strategic coherence for pro-poor development strategy. The fundamentals of this pro-poor governance and development strategy are not derived from "*a priori* theorising", but are rather based on lessons learned from actual practices in South Asia, and herein lies the strength of the book. The conceptual introduction that precedes the case studies further enriches the discussion by critically evaluating the conventional development thinking and identifying the fundamentals for alternative approaches.

This book is undoubtedly an important addition to the prevailing discussion on the subject of durable pro-poor development and provides useful insights into how the three agendas of governance, decentralisation and poverty eradication can be coordinated for better outcomes.

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Ruth Alsop, Elon Gilbert, John Farrington and Rajiv Khandelwal: *Coalitions of Interest: Partnerships for Processes of Agricultural Change*. New Delhi: Sage Publications. 2000. Pp. 308. Rs. 395.

'Development' has been the major agenda of developing countries like India, particularly where the situation and structural existences have sufficiently delayed the process of change. However, the government, civil societies and international agencies are striving hard individually to achieve this goal and the deficiencies, duplication and non-existence of mutual co-operation are being discussed.

Authors of this book postulate the confederated work of government and non-governmental agencies in the agricultural reforms sector, which otherwise has led to the creation of slag in the proposed and intended reformative changes in rural life. This idea, supported by evidence of facts and ground realities, promulgates the non-presence of technical expertise on the one side and deep-routed machinery to penetrate into the abyss of real problems on the other. What is interesting and underlying in this book is the description of the whole process with the agenda and the stream of arguments, which make it different from the conventional report publication.

Attempts to strengthen the local system from within are witnessed from the point of argument, which is visualised and understood by the extraneous forces [funding and directing agencies] (p.23). However, implicitly, the agenda behind the

funding agencies to promote the corporate (international) interests emerges and the validation of empowering coalition of agencies and government is vehemently argued as a matter of serious concern in spite of the debate of 'development' being under severe attack. In the second chapter, a detailed conceptual framework is explicated emphasising the magnitude of the problem. The inefficiencies and inadequacies of the local NGOs (p.30) have marred their performances with reference to the government policies. However, the authors seem to have accepted the government policies in their literal sense (p.37) without debating. It is, however, exemplified that both the government machinery and NGOs lack in equipment which otherwise should have supplemented each other. As a response to this hitch and bottleneck, it is suggested to have a coalition of both, which the authors call 'enabling mechanisms' (p.42).

It is also true that the position from which the authors are placed seems extremely extraneous to the situation and it is witnessed from outside than within, as the system that perpetuates is more confounded both at the decision-making level as well as implementation. Even though a more vulnerable and precarious state [Rajasthan] is selected for the study, probably the response was the most challenging to its structural, environmental, spatial distribution and the dire need was for some immediate action towards the warranted situation. Further, a detailed rubric of the NGOs' performance and the gaps surfaced are explicated graphically with systematic explanation of a series of events.

"The main weakness lies in the roles of nodes for information synthesis and management within dependent systems and in the paucity of platforms for joint decision making" (p227) and such other actions, which are essential for the functioning of 'multi-[*stake*] holder' projects and for any agenda of development with change. Contemplating on the structural impediments in this process of coalition for development, the authors have suggested three key functions (proposed [p.42]) for its members: creating common knowledge (p.234) base, sharing information (p. 234) and sharing decision making (p.235) along with the monitoring of the same.

To conclude, the idea of coalition propounded is not unique and new, but already proposed and counter-argued by many, but the way it is conceptualised and logically argued for its dire need, is definitely an idea thought 'out of the box' and necessitates immediate constructive action in this direction. The major strengths of the book can be witnessed in terms of conceptualisation of problem as well as the logically arranged necessary modalities explicating the necessary precautions to do so.

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Books at a Glance

Muraleedharan, K. *Participatory Development: Issues and Lessons*. New Delhi: Serials Publications. 2006. Pp. 195. Rs. 495.

Participatory development emerged as a recent niche giving a clear indication that development initiatives are no longer limited to state-run development plans. In fact, it inherently presumes failure of state-led development programmes. This book is a culmination of two research projects of the author dealing with participatory development experiments in Kerala. It provides a good review of literature and discussion on concepts, definitions and methodology, typically in a research report style.

The Kerala model of development, wherein the focus is on the people's campaign for decentralised planning, is analysed in different chronological phases. The author looks into the participation of stakeholders in the development initiatives across the districts of Kerala, specifically keeping in view the grassroots-level planning and implementation process. The book provides micro-level data analysis from selected Grama Sabhas. The author has scanned sufficient literature in order to write this small monograph. The work may be useful to those who seek to read about Kerala's participatory development model as reflected through micro-level experiments.

Lancy Fernandes and Satyajit Bhatkal. *The Fractured Civilisation: Caste Society in the Throes of Change*. Mumbai: Bharatiya Janwadi Aghadi. 1999. Pp. 151. Rs. 120.

Studies on caste have been attempted by social scientists from all angles, but this monograph, analysing caste from a perspective of the fractured society, provides critical connotation to the caste system. This should not be seen as another attempt to add to the large literature on caste by a large number of sociologists. Lancy Fernandes and Satyajit Bhatkal have made an excellent attempt to sharply focus on the theme. This book makes a good reading specially for those who seek to understand the development of the concept of caste and its travelogue to modern biases. It is interesting that the authors also tried to reach out to an alternative civilisational shift. They tried to figure out the emergence and uses of caste as a tool for "fracturing" the society. Caste is usually seen as an instrument to analyse social structure and social problems. Therefore, in the current politics, caste became a basis for political mobilisation; unfortunately, not many looked at caste as a tool of economic exploitation and the authors are no exception. The monograph contains lucid discussions on the progressive transition of the traditional caste system into its modern setting and how this transition has reinforced capitalism in the village economy. It deals substantially with various political ideologies beginning from Ambedkar, Gandhi through Marx to reach Nehruvian

Socialism. It also discusses the emergence of Hindutva as a fractured form of political ideology. It is clear from the monograph that the authors are deeply conscious of their formulations and raise quite a few questions in the process. Their effort is painstaking, well structured and elaborate to make a good reading. The book would generate good debate among those who look upon caste as a tool of socio-political and economic exploitation.

Omprakash Valmiki. *Joothan: A Dalit's Life*; Translated from Hindi by Arun Prabha Mukherjee. Kolkata: Samya. 2003. Pp 176. Rs. 185.

Not many English titles are available in Dalit literature and this translation of Omprakash Valmiki's *Joothan* comes as an excellent addition to that genre. Arun Prabha Mukherjee has taken all the pains to understand the basic Hindi version of this celebrated book and at no place does she compromise to alter the implicit thrust of the original text. She could bring forth all the events with nuances of the social structure. While putting forth clearly the life of an untouchable from Omprakash Valmiki's viewpoint *albeit* in a different language, she does not alter any of those details Joothan presents. It is an experience of real-life suffering of the original author and breaks new ground in the field of Dalit literature. The title itself depicts pain, humiliation and poverty of the Valmiki community and the lucid language in which the book is written makes it all the more touching. Joothan is full of conundrum and starkly highlights the untouchability syndromes and caste discrimination. The incidents and anecdotes jolt the reader out of the contrived normality of the value system. Joothan actually addresses the dual problem of class and caste without merging any felt distinctions. Valmiki's satire, pungent remarks and severe anger are directed to the upper caste readers and at the same time a Dalit reader's suffering is clearly mirrored. The introduction of the book is an authoritative review, introducing the reader to Dalit literature and highlighting the fierce feelings. The book is definitely a great landmark in Dalit literature available to the readers the world over.

Prayag Mehta. *Work, Democracy and Development: Socio-Psychological Monitoring of Organisations and Programmes.* New Delhi: Sage Publications. 2001. Pp. 203. Rs. 395.

Although the title of the book refers to work, democracy and development, which are of contemporary relevance, its focus is on methodological aspects of measuring socio-psychological behavioural dimensions of people working in development programmes. In particular, the book focuses on the development of research instruments for measuring socio-psychological behaviour and *inter alia* discusses results of a project study undertaken by the author during 1969-70.

Chapter 1, while providing a framework for work, democracy and development, seems to cover superficially a wide gamut of perspectives and attempts to emphasise the need for developing instruments in the context of interface between democracy and development (p.33). Chapters 3 and 4 deal with development and construction of instruments for measuring socio-political attitudes of school children and in the process discuss the results of the same, although it is not clear why school children have been included in the study. Chapters 5 and 6 deal with leadership and problem-solving behaviour of the functionaries working in various development programmes. The last chapter discusses the findings of the study and certain implications.

Each chapter in the book has many sub-headings which seem to distract and break the continuity of reading. Notwithstanding this, the book may prove to be useful to students of psychology and political science both from the point of methodology for assessing behaviour and in identifying different dimensions of development.

Rajamanickam, M. *Contemporary Fields of Psychology and Experiments*. New Delhi: Concept Publishing. 1999. Pp. 483. Rs. 150.

The book focuses on the emerging fields of psychology and experiments with respect to community psychology, humanistic psychology, environmental psychology and population psychology, each of which is discussed in detail under each chapter. As the author rightly puts it, all these fields study human problems from different perspectives and contribute to the development of knowledge in the field of psychology (p.6).

Chapter 1, while focusing on the community psychology, provides a historical perspective, contributors to the field, conceptual definitions, methods and approaches and various experiments in the field and discusses the results of the same. Similarly, Chapter 2 gives a descriptive account of humanistic psychology providing philosophical basis for the field and various schools of thought relating to the same, methods and approaches to the field, contributors to the development of various schools of thought, implications of this field to education, a few tests and measurements and the major experiments in the field. Chapter 3 on environmental psychology gives a background to environmental problems and the context in which the field emerged and describes what environmental psychology is all about, its relation with social psychology, human behaviour with respect to environment and environmental effects on human behaviour. The chapter also provides a good number of experiments in the field to describe various kinds of environmental effects on human behaviour. Chapter 4 on population psychology covers a broad range: nature and scope, psychological analysis of population growth, demographic groups and population characteristics and, interestingly, even a topic on psychological

perspectives of population policies across various countries. It also devotes a separate section to psychological perspective of India's population policy and psychological analysis of India's family planning programme.

The book can be a good reference book for students studying psychology and education. It is useful for researchers working in areas such as demography, environmental science, human development and community development projects.

Thangraj, M. (ed). *Land Reforms in India: Tamil Nadu - An Unfinished Task*. Vol. 9. New Delhi: Sage Publications. 2003. Pp 306. Rs. 620.

Land reforms is not a dead horse and certainly not in an agrarian economy like India. Volumes have been written about the subject during the seventies and eighties. But the analysis during the nineties focus on many new issues. Lal Bahadur Shastri National Academy of Administration, Mussoorie, undertook a massive programme to publish studies on land reforms covering quite a few states in India in the changing agrarian context. Already eight volumes have been published in this series under the general editorship of B. N. Yugandhar. The present volume addresses to land reforms in Tamil Nadu and is edited by Dr. M. Thangraj, a known scholar in the field. This volume carries 16 papers analysing various aspects of land reforms in Tamil Nadu. The analyses cover land ceilings, tenancy reforms, land reforms and productivity, organising the rural poor, Panchama lands, interface between land and caste, agrarian relations in the state and many aspects of the changing agrarian structure. Even though the contributing authors have picked up different themes, we still find a strong organic linkage between them. This book provides a balanced and informative reading on land reforms in Tamil Nadu, covering even the issues which fall in the fringe of the subject: it deals squarely with the entire gamut of agrarian issues.

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