

MicroSave India Focus Note #130

Savings Achieved through FPS Automation: Step for Greater Efficiencies

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Introduction

Under the Targeted Public Distribution System (TPDS) system, state governments give licenses to Fair Price Shops (FPSs) to distribute commodities to low-income segments. In order to further ensure protection for vulnerable households, the National Food Security Act (NFSA) was passed in 2013, specifying the minimum quantity of commodities for two categories of households: 1) Priority Households (PHH), which are entitled to receive 5 kg of food grains per person per month; and 2) *Antyodaya* households, which are entitled to receive 35 kg of food grains per month, irrespective of family size.

However, distributing through FPSs has always seen problems of diversion and “leakages”. A [high-powered committee appointed under Mr Shanta Kumar](#), Member of Parliament, estimates that 46.7% of goods distributed through FPSs were lost to “leakage”. To address this challenge, [state and central governments are exploring models that can reach out to the target beneficiaries more efficiently](#). Two of the models, suggested in the Shanta Kumar committee report, are: 1) direct benefits transfer; and 2) automation of distribution channel. In this note, we discuss savings that have accrued to the state of Andhra Pradesh (A.P.) and Telangana (partially) because of automation of FPSs. The steps followed in the automation process are:

1. **Digitisation of beneficiary database**, converting physical records of beneficiaries into digital form from the current physical register format.
2. **De-duplication** of beneficiary database with unique identification number (e.g., *Aadhaar*) to eliminate duplicate/non-existent beneficiaries.
3. **Biometric beneficiary authentication** to ensure delivery only to the intended beneficiaries and to curb leakages.

Each of these steps results in savings. However, states use different methods to calculate savings accrued. In this context, Department of Food and Public Distribution (DoF&PD), Ministry of Consumer Affairs, Food and Public Distribution, Government of India, commissioned [MicroSave](#) to develop a standard basis to compute savings accruing due to automation.

Research Design

MicroSave conducted the study in A.P. and Telangana. We covered the following sample:

Table 1: Sample for the Research

State	District	Beneficiary Interview	FGD	FPS Interview
A. P.	Krishna	250	17	17
Telangana	Hyderabad	362	18	18

The specific objectives of the study were to:

1. Determine a standard basis to compute savings by various states, to make a valid comparison; and
2. Quantify savings due to FPS automation, separating any savings due to technical (biometric failure, server failure) and non-technical reasons (old/physically disabled beneficiaries, those who could not get to the FPS), and thus unallocated grains recorded as saving.

A.P. has automated all FPSs in the state, whereas Telangana has implemented the pilot in 18 FPSs in Hyderabad. Based on the findings from the research, we can divide savings into three broad types:

1. Savings due to one-time activity of **de-duplication**;
2. Recurring savings due to beneficiaries **willingly not turning up** to receive their entitlement; and
3. Savings due to **inconvenience** – currently being calculated by states, but which should not be included. These savings are because of transaction denial due to server failure and/or authentication failure; or the shop being closed.

Current Saving Computation

For the grains supplied by the centre, Government of India (GoI) bears a cost that is known as the economic cost (EC).¹ States in turn buy grain from GoI at the centre issue price (CIP).² The beneficiary buys food grains from the FPS at the beneficiary price (BP).³ Table 2 represents recurring savings due to biometric authentication, as calculated by Krishna (A.P.) and Telangana (18 FPSs):

Table 2: Recurring Savings Calculation

Recurring Savings Calculation		
	A.P.	Telangana
Monthly allotment in MT (A)	17,424	252
Market price of rice Rs. /Kg (B)	26.64	-
Quantity unsold in MT(C)	2,089	72
Savings percent (C/A)	12%	28%
Savings /Month (B*C)	Rs.5.56 crore (USD 0.8 million)	-

¹ Economic cost – Cost of grains to central government including farm gate price, cost of storage, transportation, and wastage

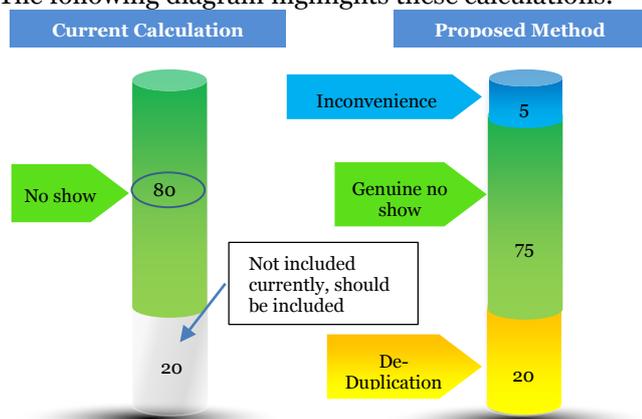
² CIP – centre issue price – Price at which centre issues grains to the state government

³ BP – beneficiary price – Rate at which beneficiary buys grains from FPS, i.e., Rs. 1/2/3 per kg

The current method of saving computation is flawed as it just multiplies the reduced off-take of food grains with the market price. We propose the following approach:

1. There are two components of savings – first savings to the centre (on account of grains not issued to the state) and, second, savings to the state (on account of grains not taken by the beneficiaries).
2. While calculating savings to the state, differential of CIP and BP should be multiplied with the quantity saved.
3. To calculate savings to the centre, quantity saved should be multiplied with the differential of EC and CIP.
4. Quantity saved because of de-duplication (one time activity) as well as self-exclusion by beneficiaries, should count towards total savings. Diversion is another major cause for high uptake of food grains in a non-automated environment. This is quite evident in the case of Hyderabad, where FPS automation has been implemented at 18 FPSs, which are showing reduced off-take, while at all the (circa 800) FPSs in the city, every single grain is being “sold”.

The following diagram highlights these calculations:



Proposed Saving Computation Template

Considering the factors above, we propose the following template for computation of savings:

Table 3: Calculation of savings due to automation

Initiative	Particulars	Units
De-duplication	No. of units before de-duplication	A
	No. units after de-duplication	B
	One-time savings (corresponding quantity saved)	$C = A - B$
Bio-metric Authentication	Monthly allotment	E
	Monthly uptake	F
	Unsold quantity	$G = E - F$
	Non-uptake due to technical and non-technical reasons	H

Savings (corresponding quantity saved)	$I = G - H$
Total savings per year (quantity)	$X = (C + I) * 12$
Total savings to state (Rs.)	$Y = (CIP - BP) * X$
Total savings to centre (Rs.)	$Z = (EC - CIP) * X$

Based on the proposed template, the actual savings for states should be:

Table 4: Savings calculation for A.P.

Particulars		A.P.
De-duplication	No. of units reduced (C)	1.625 mn
	One-time savings (corresponding quantity of rice in MT)	8,125
Particulars (in MT)		A.P.
Bio-metric Authentication	Monthly allotment (E)	214,909
	Monthly uptake (F)	182,672
	Unsold quantity (G)	32,236
	Minus non-uptake due to technical and non-technical reasons: Inconvenience ⁴ (H)	0
	Savings (corresponding quantity of rice in MT) (I)	32,236
Total savings per year (quantity in MT) (X)		484,332
Total savings to state in Rs. (Y)		225 crore (USD 33 mn)
Total savings to centre in Rs. (Z)		1,090 crore (USD 160.5 mn)

In Telangana, saving calculated on the basis of the template above (only for non-uptake), at 18 automated FPSs, comes to Rs.314,640 per month. However, assuming these ratios hold for the entire state and if automation is extended to all FPSs (34,687), total savings to the state of Telangana can be Rs.232 crore (USD 34 million) and resultant saving to centre could be Rs.1,125 crore (USD 165 million).

Conclusion

Automation of the front-end distribution system in PDS results in very significant savings which justifies the investment in deployment of automated systems. The one challenge that we foresee is that profitability of FPS has come down drastically, as diversion of food grains has almost completely stopped. Our calculations show that profitability of an FPS outlet in the automated environment will be down to Rs.1,100 (USD16.18) per month. Discussions with stakeholders shows that in the non-automated environment, FPS shops were making a profit of Rs.60,000-70,000 (USD 882-1,029 per month). State governments will have to relook and work out a commission structure that can ensure the long-term viability and sustainability of FPSs.

⁴ Inconvenience – savings accrued on account of non-uptake due to technical or non-technical reasons. It will differ from state to state. In case of AP it comes to “zero” given their advanced systems in place.