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constraint in the country and to raise income per unit of land. After 2000-01, the crop intensity in the country has increased by 0.7 percentage point per year. Large scope exists to raise crop intensity in most of the states. The emphasis on "Har Khet Ko Pani" and other components under "Pradhan Mantri Krishi Sinchai Yojana" holds promise to quickly expand irrigation, which will have very favourable effect on increasing crop intensity. Increase in crop intensity at the same rate as observed in the recent past has the potential to raise farmers' income by 3.4 per cent in 7 years and 4.9 per cent in ten years. This can turn out to be much higher as the possibilities for taking second crop are brightening.

(b) Sources of income growth outside agriculture sector

3.5 Improving terms of trade for farmers

Income earned by farmers from agriculture depends on current prices, not constant prices (fixed base year prices). However, current prices may rise purely because of inflation. Therefore, true measure of level and change in income is the one adjusted for pure inflation. The inflation adjusted level of income, termed as real income of farmers, refer to the income deflated by appropriate deflator. Various deflators have been used to arrive at real income of farmers or agriculture sector. Some of these are index of prices paid by farmers, index of input prices and index of wholesale prices of non-agricultural commodities etc. No index is perfect and each one has its own specificities. We have used CPIAL (Consumer price index for agricultural labour) as a deflator to change nominal farm income to real farm income. CPIAL captures inflation in the goods and services in rural areas and it is closer than any other index to the inflation faced by farm households.

When prices received by farmers for agricultural produce rise faster than CPIAL, it adds to the real income, even without an increase in the volume of output. As can be seen from table 2.2, during 2011-12 to 2015-16, farmers' income received serious blow on two counts. One, growth in value added in agriculture at constant prices was very low. Two, increase in CPIAL was 50 per cent higher than the increase in farm gate prices of agricultural produce. Several measures have been initiated by GOI to reverse this situation. An important measure targeted at better price realization by the farmers is e-NAM. The Centre is also persuading states to undertake various market reforms. Among other things, these reforms aim to reduce middle men, modernise value chain, attract modern private investments in agri market and, therefore, ensure better deal for the farmers.

No study is available on what could be the impact of various market reforms and market modernisation on prices received by farmers at national level. However, some evidence of the effect of online marketing by farmers using Unified Market Platform created by ReMS (a joint venture between government of Karnataka and NCDEX Spot Exchange Limited) in Karnataka shows big benefit to the farmers. The ReMS initiative is similar to the eNAM initiative of government of India. The UMP in Karnataka was created in 2014 and it started its operation from agricultural year 2014-15. The effect of UMP on prices received by farmers is attempted in table 3.2 by comparing increase in prices between year 2013-14, which is the year preceding the functioning of UMP, and 2015-16, which is the first year after creation of UMP in Karnataka. The increase in prices received by farmers in various mandis in Karnataka is deflated by WPI of the concerned commodity to arrive at increase in real terms.

After introduction of online trading and UMP modal prices in mandis in Karnataka witnessed much higher increase than the increase in wholesale prices of the same commodity in the country. The increase in real terms varies from 1 per cent to 43 per cent. The average increase for the 10 commodities for which data is available was 38 per cent in nominal terms and 13 per cent in real terms.

Table 3.2: Effect of online trading and UMP system on prices received by farmers in mandis in Karnataka

	Prices received by farmers Rs./quintal		Increase in 2015-16 over 2013-14 %	
Commodity	2013-14	2015-16	Nominal	Real@
Tur	3939	7672	95	16
Green gram	5308	7318	38	1
Black gram	3817	7976	109	12
Bajra	1261	1419	13	11
Copra	5189	9325	80	43
Turmeric	5937	7931	34	13
Jowar	1492	1774	19	6
Maize	1257	1356	8	6
Groundnut	3398	4346	28	14
Bengal gram	3057	4541	49	15
Weighted increase			39	13

[@] Real price computed after deflating with WPI of the commodity.

Source: Personal communication with MD & CEO of ReMS.

As eNAM and other market reforms focus on crop sector, their benefit will accrue only to crop sector. Accordingly, a 13 per cent raise in crop prices translate to 9.1 per cent increase in farmers' income.

The Karnataka experience shows that small reform in the system of marketing can make a big difference to the prices received by farmers. It is also important to point out that all provisions of Unified Market Platform are not yet fully operational in Karnataka. Two changes, namely, online trading and opening market to traders outside the mandi, have made a significant difference. Full implementation of market reforms and unified national agricultural market has much larger scope to raise prices received by farmers and thus their income.

3.6 Shifting cultivators to non-farm and subsidiary activities

In rural areas, agriculture sector engages 64 per cent of the total workforce and contributes 39 per cent of total rural net domestic product (Table 3.3). This shows over-dependence of workforce on agriculture with significant underemployment. This also reveals large difference in per worker productivity between agriculture and non-agriculture sectors. The estimated worker productivity in agriculture sector was only Rs 62,235 as compared

[#] Weights were taken as share of commodity in total value of all the 10 commodities at national level, year 2013-14.