# Management and Engineering in Rural Areas Sustainability Issue and Gap Analysis of Productivity of Different Crops and Resources

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Abstract—A sustainable farming system is a system in which natural resources are managed so that potential yield and the stock of natural resources do not decline over time. However, each of the components of sustainable agriculture is complex and some quantifiable measures are needed to check whether a farming system is sustainable or not. The sustainability issue of the crop productivity is fast emerging. The agricultural productivity attained during the 1980s will not been sustained during the 2020s and has posed a challenge for the researchers to shift the production function upward by improving the technology index. The yield gap analysis of major field crops and enterprises was compiled by KVK (Krishi Vigyan Kendra) team by identifying different farming situations with respect to personal interact with progressive farmers. This study was carried out with following objectives To reduce the yield gap in important crops and increase production and productivity in agriculture and allied sectors through focused and holistic initiatives and To maximize income of farmers in agriculture and allied sectors. It calls for an examination of issues related to the trends in the agricultural productivity, particularly with reference to individual crops grown in the Gujarat states of Amreli district under the Junagadh Agricultural University, Junagadh, Gujarat. KVK have adopted total fifteen no. of villages from which nine villages selected for the study, in which popular one crop is demonstrated with improved practices in each village.

Keywords: Sustainability, gap analysis, productivity, resources

## 1. INTRODUCTION

A sustainable farming system is a system in which natural resources are managed so that potential yield and the stock of natural resources do not decline over time. However, each of the components of sustainable agriculture is complex and some quantifiable measures are needed to check whether a farming system is sustainable or not. he yield gap analysis of major field crops and enterprises was compiled by KVK(Krishi Vigyan Kendra)s team by identifying different farming situations with respect to personal interact with progressive farmers in the district. This study was carried out with these following objectives :1. To reduce the yield gap in important crops and increase production and productivity in

agriculture and allied sectors through forcused and holistic initiatives. To maximize income of farmers in agriculture and allied sectors.

### 2. RESEARCH METHODOLOGY

Researcher is working in the KVK (Krishi Vigyan Kendra) at Amreli district under the Junagadh Agricultural University, Junagadh, Gujarat. KVK have adopted total 15 no. of villages from which nine villages selected for the study, in which popular one crop is demonstrated with improved practices in each village.

Sr. No	Village	Taluka	Сгор
		(Block)	
1	Mota bhandariya	Amreli	Groundnut
2	Sanosara	Amreli	Cotton
3	Ponjapadar	Liliya	Gram
4	Godhavadar	Liliya	Sorghum
5	Boradi	Dhari	Maize
6	Kathrota	Dhari	Green Gram
7	Gigasan	Dhari	Sesame
8	Mota agariya	Rajula	Pearl millet
9	Pipavav	Rajula	Wheat

Table 1: Selected villages with crop demonstrated

#### 3. RESULTS AND DISCUSSION

 
 Table 2: Sustainability issue and gap analysis productivity of different crops and resources

N 0	Factors/ Constraints Leading to gap	Strategies	Approach and methodology	Performance indicators/ output			
1	Groundnut						
a	Imbalance use of fertilizer due to lack of knowledge	To popularize the integrated nutrient management practices	Creating awareness and adoption of INM through demonstration,tra ining,etc.	Improvement in soil health, productivity, enhancement (8-10%)			

h	Weed problem	To popularize	Creating	Reduction in	3	Gram			
0	due to lack of knowledge about scientific weed management	integrated weed management	awareness and adoption of IWM through demonstration,tra ining,shibir,literat ure etc.	weed menance, labour, saving, increase in productivity (15-20%)	a	Use of inferior quality seeds of local variety due to lack of	Increase seed replacement ratio and quality seed productivity through seed	Create awareness about the importance of improved variety as worthiness of variety through demonstration	Increased area under improved variety
c 2	Non availability of improved varieties of seeds	Establishment of seed selling centers	Creating awareness for quality seeds	Timely sowing, quality seeds and better harvest (10-15%)		awareness low SRR	village. Create awareness for proper storage of	Supplying seeds as mini kits. Innovates for seed production at village level	
2	Imbalance use	To popularize	Creating	Improvement			seed		
a	of fertilizer due to lack of knowledge	the integrated nutrient management practices	awareness and adoption of INM through demonstration,tra ining,shibir,literat ure etc.	in soil health, productivity, enhancement (9-12%)	b	Less adoption of seed treatment due to lack of awareness and non-	Popularize the importance of seed treatment with	Educating and motivating farmers about importance of seed treatment and adoption through demonstrations,	Reductio n in seed borne diseases.
b	Weed problem due to lack of knowledge about scientific weed management	To popularize integrated weed management	Creating awareness and adoption of INM through demonstration,tra ining,shibir,literat ure etc.	Reduction in weed menace and increase in productivity (10-15%)	4	availability of seed treatment material leading to wilt problem	fungicides/bi opresticides for managing wilt diseases	training,shibirs and field days,	
с	Insect pest	Integrated	Creating	Management	4	Sorgnum	T	Carata	I
	problem due to lack of knowledge of insect and their management problem	pest Management	awareness and adoption of INM through demonstration,tra ining,shibir,literat ure etc	of insect pests leads to increased yield (5-7%)	а	use of inferior quality seeds of local variety due to lack of awareness	replacement ratio and quality seed production through seed village.	create awareness about improved variety as worthiness of variety through demonstration. Supplying seed as mini kits.	area under improved variety
d	Reddening of cotton due to micronutrient deficiency	Spraying of potassium nitrate and other micronutrient s	Creating awareness and adoption of INM through demonstration,tra ining,shibir,literat	Increase in productivity (10-15%)	5	Maize	Create awareness for proper storage of seeds	Innovate the progressive farmers for seed production at village level.	
			ure etc		а	Use of	Increase seed	Create awareness	Increased
e	Non availability of seed selling center of Gujarat seed corporation	Establishment of seed selling counters by Gujarat State seed certificate Agency at taluka level or strengthening co-operative	Creating awareness for quality seeds and establishment of seed selling counters	Timely sowing of quality seeds leads to better harvest (3-5%)		inferior quality seeds of local variety due to lack of awareness	replacement ratio and quality seed production through seed village. Create seed awareness for proper storage of seeds	about improved variety as worthiness of variety through demonstration. Supplying seed as mini kits. Motivate the progressive farmers for seed production at village level.	area under improved variety
		structures			6	Green gram			
						Problem of viral diseases due to use of susceptible local seeds, poor management practices	Popularize tolerant varieties of green gram and management practices	Creating awareness and increase adoption of tolerant varieties of green gram and disease management practices through demonstration,trainin g, <i>Shibir</i>	Increased productio n of pulses

1	Sesame			
a	Low	То	Creating awareness	Increased
	germination	popularize	through	yield (5-
	due to	scientific	demonstration	8%)
	improper	package of	,training,shibir,literat	
	placement of	practices	ure etc	
	seed and lack	-		
	of knowledge			
	about that of			
b	Low adoption	То	Creating awareness	Increased
	of improved	popularize	and adoption of	in the
	package	scientific	scientific package of	productio
	practices due	package of	practices through	n (10-
	to lack of	practices	demonstration,trainin	12%)
	awareness	1	g,field	
			davs.shibir.lirerature	
			etc	
с	Insect pest	Integrated	Creating awareness	Manage
	and disease	pest and	and adoption of IPM	ment of
	problem due	disease	through	insect
	to lack of	management	demonstration.	pest and
	knowledge of		training.	disease
	their		Shiber, literature etc.	lead to
	management			increased
	options			vield ()
d	Maintain	Thinning and	Creating awareness	Increased
ů	plant	sowing on	and adoption thinning	in vield
	population	ridge and	and land	(2-5%)
	and land	furrow	configuration through	(2 3 /0)
	configuration	Turrow	demonstration	
	High seed		training.	
	rate and		shibir literature etc	
	sowing in flat		sinon, includic etc.	
	1 1			
	land			
8	land Pearl millet			
<b>8</b>	Pearl millet	То	Creating awareness	Increase
<b>8</b> a	Pearl millet Low adoption of improved	To popularize	Creating awareness and adoption of	Increase in the
<b>8</b> a	Pearl millet Low adoption of improved package of	To popularize scientific	Creating awareness and adoption of scientific package of	Increase in the productio
<b>8</b> a	Pearl millet Low adoption of improved package of practices due	To popularize scientific package of	Creating awareness and adoption of scientific package of practices by means of	Increase in the productio n
<b>8</b> a	Pearl millet Low adoption of improved package of practices due to lack of	To popularize scientific package of practices	Creating awareness and adoption of scientific package of practices by means of extension of tools	Increase in the productio n
<b>8</b> a	Pearl millet Low adoption of improved package of practices due to lack of awareness	To popularize scientific package of practices	Creating awareness and adoption of scientific package of practices by means of extension of tools	Increase in the productio n
<b>8</b> a b	Pearl millet Low adoption of improved package of practices due to lack of awareness Insect pest	To popularize scientific package of practices Integrated	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness	Increase in the productio n Manage
8 a b	Pearl millet Low adoption of improved package of practices due to lack of awareness Insect pest and disease	To popularize scientific package of practices Integrated pest and	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM	Increase in the productio n Manage ment of
8 a b	Pearl millet Low adoption of improved package of practices due to lack of awareness Insect pest and disease problem due	To popularize scientific package of practices Integrated pest and disease	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through	Increase in the productio n Manage ment of insect
8 a b	Pearl millet Low adoption of improved package of practices due to lack of awareness Insect pest and disease problem due to lack of	To popularize scientific package of practices Integrated pest and disease management	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration.	Increase in the productio n Manage ment of insect pest and
8 a b	Pearl millet Low adoption of improved package of practices due to lack of awareness Insect pest and disease problem due to lack of knowledge of	To popularize scientific package of practices Integrated pest and disease management	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training,	Increase in the productio n Manage ment of insect pest and disease
8 a b	Pearl millet Low adoption of improved package of practices due to lack of awareness Insect pest and disease problem due to lack of knowledge of their	To popularize scientific package of practices Integrated pest and disease management	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir.literature etc.	Increase in the productio n Manage ment of insect pest and disease leads to
8 a b	Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management	To popularize scientific package of practices Integrated pest and disease management	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc.	Increase in the productio n Manage ment of insect pest and disease leads to increased
8 a b	Iand         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options	To popularize scientific package of practices Integrated pest and disease management	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc.	Increase in the productio n Manage ment of insect pest and disease leads to increased yield
8 a b	Iand         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options         Maintain	To popularize scientific package of practices Integrated pest and disease management	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc.	Increase in the productio n Manage ment of insect pest and disease leads to increased yield Increase
8 a b	Iand         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options         Maintain         plant	To popularize scientific package of practices Integrated pest and disease management Thinning and sowing on	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc.	Increase in the productio n Manage ment of insect pest and disease leads to increased yield Increase in vield
8 a b	land         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options         Maintain         plant         population	To popularize scientific package of practices Integrated pest and disease management Thinning and sowing on ridge and	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc. creating awareness and adoption and land configuration	Increase in the productio n Manage ment of insect pest and disease leads to increased yield Increase in yield
8 a b	land         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options         Maintain         plant         population         and         land	To popularize scientific package of practices Integrated pest and disease management Thinning and sowing on ridge and furrow	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc. creating awareness and adoption and land configuration through	Increase in the productio n Manage ment of insect pest and disease leads to increased yield Increase in yield
8 a b	land         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options         Maintain         plant         population         and land         configuration	To popularize scientific package of practices Integrated pest and disease management Thinning and sowing on ridge and furrow	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc. creating awareness and adoption and land configuration through demonstration.	Increase in the productio n Manage ment of insect pest and disease leads to increased yield Increase in yield
8 a b	land         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options         Maintain         plant         population         and land         configuration         high seed rate	To popularize scientific package of practices Integrated pest and disease management Thinning and sowing on ridge and furrow	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc. creating awareness and adoption and land configuration through demonstration, training,	Increase in the productio n Manage ment of insect pest and disease leads to increased yield Increase in yield
8 a b	land         Pearl millet         Low adoption         of improved         package of         practices due         to lack of         awareness         Insect pest         and disease         problem due         to lack of         knowledge of         their         management         options         Maintain         plant         population         and land         configuration         high seed rate         and sowing in	To popularize scientific package of practices Integrated pest and disease management Thinning and sowing on ridge and furrow	Creating awareness and adoption of scientific package of practices by means of extension of tools Creating awareness and adoption of IPM through demonstration, training, shibir,literature etc. creating awareness and adoption and land configuration through demonstration, training, shibir liturature	Increase in the productio n Manage ment of insect pest and disease leads to increased yield Increase in yield

9	Wheat			
a	Use of	Increase seed	Create awareness	Increased
	inferior	replacement	about the importance	area
	quality seed	ratio &	of improved variety	under
	due to lack of	quality seed	through	improved
	awareness	production	demonstration.	variety
		through seed	Innovate the	(5%)
		village.	progressive farmer	
		Create	for seed production at	
		awareness	village level	
		for proper		
		storage of		
		seeds		
b	Limited	Application	Create awareness	Increase
	irrigation	of water at	about critical stages	in yield
	facility due to	critical	through	(10-
	lack of	stages	demonstration	12%)
	knowledge of			
	critical stages			
с	Weed	То	Creating awareness	Reductio
	problem due	popularize	through	n in
	to lack of	integrated	demonstration,	weed
	knowledge	weed	training,	menace
	about	management	shibir, literacture etc.	and
	scientific			increase
	weed			1n
	management			productiv
				1ty (5-
	1	1		(%)

## 4. CONCLUSION

The sustainability issue of the crop productivity is fast emerging. The productivity attained during the 1980s has not been sustained during the 1990s and has posed a challenge before the researchers to shift the production function by improving the technology index. It has to be done by appropriate technology interventions, judicious use of natural resources and harnessing biodiversity. During the Green Revolution era, large investments were made on research and development for the irrigated agriculture. The promotion of HYV seed - fertilizer - irrigation technology had a high payoff and rapid strides of progress were made in food production.

## References

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