## Chapter-3

# **Energy and Farm Management: The Relevant Research Accross the World**

S.K. Acharya, G.C. Mishra, Sneha Bera and A. Biswas

In any scientific investigation and research a comprehensive review of literature is very essential. Its main function apart from determining the work done before concerning the problem area i.e. area of investigation, it provides an insight into the methods and procedures and create a basis for interpretation of findings. As direct references of all the items are not in abundance, certain specific references along with some indirect references have been incorporated in this chapter for the purpose of meaningful use. In the present study, reviews of literature have been summarized among following heads.

- a. Energy and Farm Management
- b. Energy Metabolism in Farming
- c. Energy Economics and Energy Management
- d. Farm Metabolism and Energy Equivalence
- e. Social Ecology and Farming
- f. Energy and Development
- g. Energy Policy and Planning
- 8. Energy Use in Agriculture

### ENERGY AND FARM MANAGEMENT: THE RELEVANT RESEARCHACCROSS THE WORLD

S	ourc	ee	Year	Author		Key Po	ints			
Energy	sav	ings in	1988	Pellizzi,	G,	In this pape	er, a	fram	newo	ork
agricultu	ral			Cavalchini,	AG,	to assess t	ope	ratio	nal	
machine	ry	and		Lazzari, M.		energy inp	of vario		ous	
mechaniz	zatio	n,				production system			S	and
Elsevier		Science				the relative	e pei	rfori	mano	ce
Publishir	ıg	Co.				of a grow	er w	ithir	n an	L
New You	rk, U	JSA				adopted	syst	em		is
						developed. This paper			er	
						shows the usage of energy			gy	
						of cotton production into			to	

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	ı						1					-
							six	bro	adly	7	dist	inct
							process	es,		inc	ludir	ıg
							fallow,	pla	ntin	g, i	n-cro	p,
							irrigatio	on,	har	vest	ing	and
							post ha					
TT 11		C	1000	Ct. t DA			CD1 ·					
Handboo	K	of	1990	Stout, BA			This	is	ınc	lude		use
energy	for	world					fertilize	er,	fer	tilize	er	and
agricultu	re.						nitroge	n fiz	xati	on,	polic	ey
Elsevier		Science					of fertil	izer	and	l fert	ilize	r
Publication	ons	Ltd,					transpo	rtati	on	and	l	also
London							describ	ed	ene	ergy	for	the
							water supply, use				of	
							energy				on	and
							potentia		•			in
							irrigatio			wel		as
							mechar		ion			of
							agricult			duc	tion	l
									•			
Energy		in	1994	Tullberg,	J,	and	This	boo	k	pre	sents	a
agricultu	re.			Wylie,P.			scoping	5	stu	dy		of
Conserva	tion						opportu	ıniti	es	to	enh	ance
Farming							energy efficiency and					
				22								
Informa	tion	Centre,					Minin	nise	GH	[G e	miss	ions
Dalby, Q										nd's intensive		

In	form	atio	on Centre,				Minimise GHG emissions
Dal	by, (	Que	ensland,				in Queensland's intensive
Aus	strali	a;					agricultural sector with
							aims of - Review and
							assess available tools and
							technologies for

			conducting on-farm								
						condi	ucting	g or	n-farn	n	
						opera	tiona	1		en	ergy
						asses	smen	ts/a	udits	,	
						Asses	s cu	rrei	nt	pr	actices
						in	term	ıs	of	en	ergy
						effici	ency,	,		Id	entify
						oppo	rtunit	ies	to	re	duce
						opera	tiona	ıl er	nergy	in	puts
						and		im	pacts		on
						green	hous	e ga	as em	iss	sions
On farm en	ergy use	2002	Canakci,		M	This	resea	rch	atten	npt	s to
pattern in	different		Akinci, I			inves	tigate	e the	e ene	rgy	use /
cropping	systems	_				patter	rns	inC	Green	ho	use
in Haryar	na, India,					veget	able	pro	duct	ion	, to
University	of					deter	mine	ne the energy			ergy
Flensburg,						outpu	ıt–inp	ne the energy nput ratio and lationships and			
Germany, 2	2002					their	relat	ine the energy input ratio and relationships and			and
						intro	duced	l			
Potential	energy	2005	Brown,	E,	and	The p	nurno	se o	of this	s n	aner
		2002	Elliot,	Δ,	una						
efficiency			RN			is	to	rev			extant
in the ag	riculture					progr			pron		Ŭ
sector,	The					energ	y eff	icie	ncy i	n t	he
American	Council					agric	ulture	2	secto	or	and
for an	Energy-					ident	ificati	ion	of	na	tional
Efficient E	conomy,					wide		pro	gran	ıs	,
Washington	n, D.C					deter	minin	ıg			the
						motiv	ation	1	of		the
			23								

					program, obtaining a				
					program description and				
					evaluation program				
					impact and success formal				
					or non formal				
Comparative	e		2007	Saunders, C.	This report compared the				
Energy		and		Barber, A.	energy used and CO2				
Greenhouse		Gas			emissions between NZ				
Emissions	of	New			and UK Dairy production.				
Zealand's	ano	d the			It has described that the				
UK's		Dairy			UK uses twice as much				
Industry					energy per tonne of milk				
					solids produced than NZ,				
					, even including the				
					energy associated with				
					transport from NZ to the				
					UK.				
Farm Powe	25	and	2008	Hunt, D.	This book presents the				
Machinery	<b>31</b>	anu	2008	Hullt, D.	optimization of the				
Managemen	ıt-	10th			equipments phases of				
edition					agricultural production				
					which concerned with the				
					efficient selection,				
					operation, repair and				
					replacement of				
					machinery. The main				
					aims of this books was to				
					analyse the factors that				

					comprise machine						nei	y
					mar	nage	eme	nt,	to	ex	pla	in
					the	f	unc	tion	of	vai	rio	us
				24								
				24	<u> </u>					ļ	Ш	
					m	ach	ines	s and	me	echa	ani	ism
					as	the	eya	ffect		eco:	no	mic
					ope	rati	on.					
Optimality	7		2010	Gandhia, A.	In	thi	s p	aper	foo	cuse	ed	on
Analysis		of		Guptaa, V.	the popular metric					;	of	
Energy-				Baltera, M.H.	energy response time					tin	ne	
Performan	ce			Kozuch, M.A.	product to capture					e	the	
Trade-o					energy performance							
for Server					trac	leof	ff a	ınd	pre	eser	nt	the
Farm Man	age	ment-			firs	t the	eore	etical	res	ult		on
Elsevier					the	op	tima	ality		of	ser	ver
					farr	n	r	nana	gen	nent		
					poli	icie	s. It	also	dis	cuss	sed	l
					a	pat	tterr	n of		stat	ior	nary
					den	nan	d an	ıd hav	ve p	rov	ed	
					that	t th	ere	exis	ts a	ı ve	ery	
					sma	all,	r	natura	ıl	clas	SS	of
					poli	icie	s t	hat			alv	vays
					contains the optimal for						or a	ı
					sing	gles	serv	er as	we	11 as	s a	
					nea	r o	ptin	nal	po	licy	,	for
					mu	lti s	erve	er sys	ten	1.		
Energy us	se p	attern	2011	Ibrahim, H. Y.	Th	ne a	im	of th	is p	ape	rv	was
in	veg	getable			to e	xar	nine	e the	ene	rgy		

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production	1	under		use	patte	rn,	ener			use
Fadama	in	north		effi	ciency	y and e	ne	rgy		
central Ni	geri	a		pro	rity	fo	r	Or	nion,	
				Tomato, Swee				ano	d	Hot
				Pepper produ			etio	on	un	der
				Fadama						

#### **Energy Metabolism in Farming**

Sou	rce	1		Year	Author				K	ley I	Poir	nts	
Integrati	on		of	1980	Ingvartsen, L.	K.	and	The	ob	jecti	ive	of	this
Metabol			and		Andersen, J.	B.		revie		is			ntify
Intake R	egul	atic	n:					and discuss					
A		Re	eview					important			me	tabo	olic
Focusing	g or	ı	Per					factor	rs it	ıvol	ved	in t	he
parturier	nt An	nim	als,					regula	atio	n			
								of			Pre	edict	ting
								Volu	ntar	y D	ry N	Лett	er
								Intake(VDM		(I)		and	
								their integra		itio	1	with	
								metabolism.					

Energy	cos	st	of	1990	McBride, B.	W.,	This	pa	aper	int	rod	uced
absorpti	on		and		Kelly, J.M.		contr	ib	ution	S		of
Metaboli	etabolism		of				vario	us	biocl	nem	ical	
ruminant	t								to	ove	rall	
gastroint	estin	al					energy expenditure		ure	in		
tract	and		live;				the		Gast	roin	testi	inal
Journal	of	Ar	nimal				tract (GIT)			and		
Science							assessed of liver.					

Journal	of	Animal	1999	Huntington,	G.B.	This	aper	d	esci	cribes		
Science				Archibeque, S.L		the			qu	anti	itative	
						aspec	ts	of	ure	a	and	
						amme	oni	a				
						Meta	lism	ı		in		
						rumir	its	and		it		
						relates the metabolic				olic		
						or ec	on	omic		cos	sts of	
						that	m	etabo	olism		to	
						practi	ica	1		fee	ding	
						situat	ior	ns. It				
						concludes with a				a		
				26								

				discussion of conflicts						
			8	and	cons	sider	atior	ıs		
			8	amor	ıg	thre	e m	ain		
			1	prior	ities	in	rum	inar	nt	
			]	N me	etabol	ism:	1)			
			1	maximizing microbial						
			1	function in the rumen;						
			2	2) optimizing amino					0	
			8	acid	suppl	y to	the l	ost		
			1	rumii	nant;		and		3)	
			1	miniı	nizin	g ne	gativ	'e		
			]	Environmental effects					ts	
			(	of cycling N through				gh		
			1	ruminant production						
				systems.						

Jou	ırnal	1	of	2001	Bava, L. Ra	apetti, L.	This	s pap	er	sl	nows	a
Dairy					Crovetto,	GM	expe	erimen	t th	at '	was to	3
Science					Tamburini, A	·-	com	pare	bet	wv	ven	a
							silag	ge-bas	ed		conti	rol
							diet	(C)		ar	nd	a
							non	forage	die	t (1	NF) ir	1
							dair	y goat	s th	rou	ıghou	t
							lacta	ation	in	te	terms o	
							anin	nal	pei	fo	rmano	ce
							and	energy	y ut	iliz	ation	
Effect	of	die	tary	2005	TAMMIN	NGA, S	This is the compa					res
energy	sour	ce	on		KEMP, B		stud	ies			whic	h
energy l	balan	ce,					man	ipulat	ed			
product	ion,						dieta	ary en	erg	y	sourc	ce
metabol	lic dis	orde	ers					shows				
and	,.										•	
reprodu								gy			e ca	
in lacta	ting	dan	<u>у</u>							lance		of
cattle							the	C2/0	C3 	ra	tio,	as
					27							
							indi	cated	b	y	plas	ma
							NEF	A,			β-	
							hydr	oxybu	tyra	te		
							(BHI		an		gluce	ose
							level. It is shown that					
							glycogenic nutrients					
							increase glucose and					
							insulin concentrations					
		-	-				msum concentrations					

NEFA

and decrease

					and BE	IBA	pla	asm	a	
					levels.	Extr	a li	pog	gen	nic
					nutrien	ts			ele	evate
					NEFA	and	BH	IBA	<b>\</b> a	nd
					decreas	se			pla	asma
					glucose	9				
					concentratio			S.		
					Lipogenic			c nutrie		
					generally			inc	rea	se
					milk	fat	-	per	cer	ntage
					and	dec	rea	ise		milk
					protein percent			nta	ge,	
					suggesting a surplus of				of	
					C2 compounds.					
A continual to the		2010	Davilson	DC.	This			<b>.</b>		la aver
Agriculture,		2010	Beukes,	PC	This p	раре				
Ecosystem	and		Gregorini,P	Romera	to			ma		
Environment,			AJ		produc	tion,	, bu	ıt re	du	ce
					GHG	em	issi	ons	5	per
					unit	of		lan	d	and
					produc	t by	r :	imp	oro	ving
					production eff			effi	cie	ency.
					A farm-scale computer			ter		
					model that		t	inc	lud	les a
					1	I				
					mechan					cow
										cow
			28							cow

Model is used to model an average, pasture-based New Zealand farm over different climate years.

#### **Energy Economics and Energy Management**

Source	Year	Author		Key	poi	nts			
							1		
	2001		This	study	a	ınalyse	ed		the
Inzynieria-		Niedzioka,-I	labour a	nd energ	y in	puts, a	and		
Rolnicza			the cos	t of ma	aize	grai	n		
			producti	on of a fa	ami	ly farr	n		
			in Pola	nd.	I	Labour	-	inp	outs
			average		35	.4man	hour	/ha,	
			Electrica	and			mec	han	ical
			energy inputs			puts			were
			172.7kw	h/t, and	the	input (	of		
			cumulati	ive energ	gy	was -:	5.7		T
			Gj/t. Di	t. Direct product					cost
			of maiz	e of ma	ize	grain			T
			amounte	ed to 390j	pln/	⁄t			
D 11 4	2006	Bianchi,-F-J-J-	T1 ·	. 1.	,	41 4			
Bulletin-	2006	A; Werf,-W-van-	This pa	per indic	cate	that	a		
OILB/SROP		der;	major	reduction	n		in f	arti	lizer
		Honek,-A	input aft	er the tra	ınsit	tion to	a		
			market e	economy,	, res	sulted	in		
			lower	aphid			popi	ılat	ion
			density	in cerea	1 cr	rops a	nd		
			negative	ely	aff	fected		ene	ergy
			sequestration surviv		surviva	ıls		and	
			reproduc	ction	С	of	lady	bee	tles,
					+				
		29							
		47		L					

			resulting	g in	th	e o	bserved
			populatio	n	decl	ne	in the
			species.				
	2008	Waheed,-M-A;	Energy as	nd ex	ergy	stud	ies
Energy-		Jekayinfa,-S-O;	were con	nduct	ted in	an (	orange
Oxford		Ojediran,-J-O;	juice mar	nufac	turing	ind	lustry
		Imeokparia,-O-E	in Niger	a to	dete	mir	e the
			energy c	onsu	mptio	n	pattern
			and me	thod	s of		energy
			optimizat	ion i	n the	com	pany
Journal-of-		Channabasavanna,					
Farming-	2010	-A-S; Biradar,-D-	To stu	dy	the	pr	oduction
Systems-		P;	efficiency	٧,	ener	gy	input
Research-and-		Mahabhaleshwar-	managen	ent	an	d	its
Development		Hegde;	efficienci	es as	influ	ence	ed by
		Prabhudev,-K-N	rice-fish-	poult	ry i	nteg	rated
			farming				
			System n	nodel	s (IFS	5)	
Proceedings-of-		Asakereh,-A;	The aim	of thi	a atuá	X 7 X X X	oro to
the-10th-							
	2000	Keyhani,-A;	determine				
International-	2009	Safaienejad,-H-A-	and indi				-
Agricultural-		M; Garavand,-A-T	farming of				
Engineering-			to invest		- U	-	ficiency
Conference,-			of energy				
Bangkok,-			make an				nalysis
Thailand			of dry fa	ırmir	ng ch	ıckp	ea in

		koohdasht county of iran.						
	30							

	2012		wavuya,-S- G;	I	n th	is stud	y, we assess	s th	e
Renewable			ele,-S; rfuss,-	costs	of	energ	y generatio	n	
-Energy		I;	Zeller,-M;	from	maj	or	energy	so	urces
		Μι	ıller,-J	(firewo	od a	ınd duı	ng) in rural		
				Ethiopi	a, a	s wel	1 as the		
				econom	nic po	otentia	l of biogas		T
				as	an	altern	ative		in
				address	ing	g both energy and			
				food se	curit	y chall	enges		
Biomass-and-	2012	Kra	asuska,-E;	This	work addresses			cu	rrent
Bioenergy		Ro	senqvist,-H	and	futu	ire	economics		of
				willow,	,	Misca	anthus		and
				triticale	;	(a	whole	cro	op)
				product	tion 1	for ene	rgy use in		
				Poland.		The	economics	of	
				energy	crop	s is s	et next to		
				that	of	comn	non	ce	real
				product	tion 1	for gain	n		
Continental-	2012	Nn	aji,-C-E;	This	pap	nper described		1	the
Journal-of-		Uz	oma,-C-C;	Rural		house	hold	en	ergy
Environmental-		Ch	ukwu,-J-O	consum	ptio	n	survey		data

Sciences			collected between September							
			2009 an	d Jar	nuary 2	2010 was				
			utilised to investigate the							
			socio-economic factors							
			determining fuelwood use for							
			cooking	by r	ural h	ouseholds				
			in Nsuk	kka a	area o	f Enugu				
			State, N	igeri	a.					
Farm Metabolism and	Energy E	quivalence:	:							
		31								

Source			Year	Author	Key	po!	ints	
Indian	Journal	of	1985	Mittal et al	This paper		prese	nt
Agronoi	my 54(1)	):			different	Ene		зу
80_90	(March				Sources,			
2009					Classificat	tion		of
					energy,		Energ	зу
					input from	n	vario	us
					sources,			
					Calculatio	n		of
					energy			
					requireme	nts	for	a
					field			
					Operation		an	d
					energy eq	uiva	lence	9
					measure			
Social E	cology a	nd Fa	arming:					

Source			Year	Author			Key	y po	oint	S	
Barriers an	nd brid	lges	1995	Gunderson,LH		This p	nape	r ex	plo	res	
				Holling, CS Lig	ght,						
1	enewal			SS		the wa		101		acti	
ecosystem		and				adopt				and	
institution	S.					learni					
						with					in
						the m		gen		1	of
						comp				egional	
						ecosystem. It als					
						shows					
						chapter including				4	
						sections, these are					
						introd				son	ne
						case	stuc	lies	,	new	V
				32							
						Brunsv	vick				
						(Canad	a)fo	rest	t		
						policy				and	
						manage	emer	nt		and	
						water	n	nana	age	mer	nt
						of th	e e	ver	gla	des	
						wetland	ds in	Fle	oric	la.	
A social	ecolo	gy	1997	GROVE,JM		This				pap	er
approach		and		WILLIAM R.		addressed the		the			
application	ns	of		BURCH. JR.		heterogeneity of					
urban	ecosy	stem				different ecosystem.					
and	lands	cape				It also	illus	trat	es t	he	

	I				1			1		
analyses:	a	case				hum	an	ecc	sys	tem
study of E	altin	nore,				and		lan	dsca	ape
Maryland						appr	oach		anc	d how
						the c	once	ept o	f so	cial
						diffe	renti	iatio	n	can
						be	app	lied	spa	itially
						at				scales
						with	vith a cas			study
						from the research in				ı in
						Balti	mor	e.		
						Mar	ylano	d.	Further.	
						This		pap	er	also
						iden	tifies	5	dif	ferent
						meth	ods.			Tools.
						And	tech	niqu	ies t	hat
						can be used for an				an
						integ	rate	<u></u>		Urban
						ecosystem approach				

#### **Energy and Development:**

Source	Year	Author		Key points			
			This	paper sun	nmari	zes	
Energy-	2007	Vera,-I;	the	outcome	of	an	
Oxford		Langlois,-L	inter	national			
			partn	partnership initiative			
			on	indicators	S	for	
			susta	inable	en	ergy	
			deve	development that aims			
			to	to provide			

				analytic	al	tool		for
				assessin	ıg		cur	rent
				energy	prod	uctio	n an	ıd
				use pa	ttern	S	at	a
				national	l leve	el.		
Renewable-energy-	2007		Rathore,-N-S;	This bo	ok co	ontai	ns tł	ne
sources-for-			Panwar,-N-L	followi	ng ch	apte	rs: (	1)
sustainable-				Introdu				(2)
development				Integrat	ed		ene	ergy
				plannin	g;	(3)	Su	rvey
				method	olog	y		for
				energy	den	nand		and
				supply				
				,	(4)		En	ergy
				integrat				(5)
				Approa				for
				integrat	ed ru	ıral e	nerg	gy
				systems	; (6	<u>(</u> )	En	ergy
				forecast	ing;	1		(7)
				Modelli	ng	for	rur	al
				energy	plar	ning	·,	(8)
				Utilisati	ion	of	sol	ar
				energy	for	1	the	rmal
		34						
				applicat		(9)	)  ;	Solar
				photovo		;	+	
				technology; (10)				(10)
				Energy from biomass;				
				(11) E	Biodi	esel-	ener	gy

			option	1S;	(12	.)	Biogas
			techno	olo	gy;		(13)
			Harne	essi	ng	the	power
			from wir			nd;	(14)
			Improved			cook	stoves;
			(15)		Fue	el	cell
			techno	olo	gy;	and	(16)
			Techr	10-6	ecor	omic	
			analys	sis		of	energy
			option	1S.			
Agricultural-	2011	Wu-ShanShan;	This	stı	ıdy	was	s to
Science-and-		Yao-ZhiJun;	provio	de		the	oretical
Technology-Hunan		Shen-Lei	basis		for		getting
			sustai	nat	ole		
			development		of	rural	
			energ	y	in	Tibet	into
			reality	у.			

#### **Energy Policy and Planning**

Source	Year	Author	Key	points	
	2008	Foo,-D-C-Y;	This	work	presents
		Tan,-R-R;			
Energy-		Ng,-	algebraic		targeting
Oxford		D-K-S	techniques	for	energy
			sector	planningv	vith
			carbon(CC	02)	emission
		35			

			and	lar	nd		ava	ilat	ility
			consti	raints	S				
Journal-of-Applied-	2008	Njoku,-P-C	The	prol	blen	n	of	wa	ste
Science-and-			flow	in	ene		У	sys	tem
Technology			plann	ing	wa	.S	inve	stig	ate
			by	ado	ptin		inte		
			syster	n		er	ngine	erin	ıg
			appro						
D 11	2000	771 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			•		C		
Renewable-	2009	Zhang-LiXiao;	An o				of		ergy
Energy.		Yang-ZhiFeng;	consu					1	by
		Chen-Bin; Chen-	availa		dat	a	and		the
			analy	S1S					
Renewable-	2009	Giatrakos,-G-P;	This	stud	-		resen		the
Energy		Tsoutsos,-T-D;	sustai				anni		of
		Mouchtaropoulo	some				aspe		
		s,-P-G; Naxakis,-	energ					rur	
		G-D;	China						
		Stavrakakis,-G	paper						
			energ	y	sys	ste	m,	wh	ich
			aims 1	to ful	lfil 1	the	elec	tric	
			needs	of	the	is	land	by	
			replac	eing	the	;	exis	ting	
			diesel	gen	erat	ors	s wit	h ne	w
			wind	farn	ns,	pł	notov	olta	ic
			installations and hydrogen					en	
			produ	ction	ı sy	ste	ms.		
									L

	2009		The study provides an
Climate-Policy		Suwa,-A	insight into the
			effectiveness of the
			methodology, and
		36	
			implications of the
			proposed visions and
			policy packages. A series
			of innovations are made,
			including the 'policy road
			map' as an effective tool
			that links the back casting
			framework and strategic
			policy discussions.
	2009	Borges-Neto,-M-	This paper introduces the
Engenharia-		R; Carvalho,-P-	development of a
Agricola		C-M-	computational tool to help
			the energy planning in
			rural electrification areas
			by using the main
			software available on the
			world market or cited in
			scientific literature, as in
			the reference.
	2010	de Keirstead,-J;	This paper considers the
Energy-		Schulz,-N-B	field of urban energy
Policy		Sensie, III	policy, a neglected yet
			important topic

Energy Policy	2010	Hiremath,RB;	Present wor	k us	es go	al-	
		Bimlesh-Kumar;	programmin	g 1	metho	od	in
		Balachandra,-P;	order to anal	lyze t	he D	EP	
		Ravindranath,-N-	through	ł	otto	m-u	ıp
		Н	approach				
	2010	Hoggan Lyan:	This paper	doge	cribes		
D 11	2010	Hoesen,-J-van;				S .	a
Renewable		Letendre,-S	possible	mod	lel		for
-Energy			supporting			rui	al
			community		ener	gy	
			projects	usin	g		a
			Geographic	Info	rmat	ion	
			System (GIS	), wh	ich w	as	1
			used to	deve	elop		an
			inventory	of	ener	gy	ı
			resource po	tentia	ıl	in	a
			rural Vermo	nt	towi	n	for
			biomass, wi	nd,	and	so	lar
			technologies	•			
Journal-of-	2010	Mirzaesmaeeli,-	The objectiv	e of t	he ca	se	
Environmental-		H; Elkamel,-A;	studies is to				
Management		Douglas,-P-L;	economical,		struc		al.
		Croiset,-E;	and environr	nenta			,
		Gupta,-M	Effects that v	vould	l resu	ılt i	f
			the electricit				
			required to re				
			emissions to		spec		
			limit.		5p <b>3</b>		
	1		1111116.	1	1	I	L

Transactions-of-the-	2011	Zhang-LiXiao;	Based on available data of					
Chinese-Society-of-		Hu-QiuHong;	rural ener	gy (	consi	ımpti	ion,	,
Agricultural-		Wang-ChangBo	the spatial and tempora				al	
Engineering			characteristics of rur				al	
			energy	coı	ısum	ption	ı	as
			well as th	ie ev	olve	ment	of	
			rural ene	rgy	poli	су	we	ere
			analyzed					
	2011	D 1 W T	mi :		1.	.1		
	2011	Park-KyungTae;	This pape	er st	udies	the	cosi	Į
Energy -		Shin-DonGil;	of ene	rgy	(CO	E)		for
Oxford		Yoon-EnSup	several	em	ergir	ıg,	fos	ssil
		20						
		38						

			fuel power plants such as							
			an integ	rated		ga	sifi	cati	on	
			combined cycle (IGCC)						C)	
			power plant, a natural gas							
			combine	ed	cycl	e	(No	GC	C)	
			power	plan	t,			ano	d	a
			pulveriz	ed		co	al		(P	C)
			power	plan	t	un	ıder		th	ree
			different	scen	arios	de	fine	d		
			by	the		In	tern	atio	na	1
			Energy A	Ageno	y (IE	EA)	)			
Songklanakarin-	2011	Pattanapongchai,	The obje	ective	of th	is s	stud	V		
Journal-of-Science-		-A;	is to inv							
and-Technology		Limmeechokchai	biogas with a selected							ted
		,-B	water sc	rubbii	ng teo	chn	niqu	e		
			featuring							

			plannin	ıg						
	2011	Domac,-J;	This	pape	r disc	uss	ses			the
Biomass-and-		Segon,-V;	method				apj	oro	acł	1
Bioenergy		Przulj,-I; Rajic,-	to loca	al energy planning						
		K	propose	osed by the authors					ors	
			and	ident	ifies		the	;	m	ost
			importa	ant	driv	ers	<b>\</b>	fo	r	its
			applica	tion a	t the r	egi	iona	1		Г
			level.							
Energy-water-	2011	Escobar,-M;	This re	port fo	ocuses	S 01	n the	<u> </u>		
climate-planning-		Lopez,-F-F;	third	opt					ndi	ng
for-development-		Clark,-V	energy	sourc	ces		tha	ıt	er	nit
without-carbon-in-			little or	no ca	ırbon,	ca	lled			
LatinnAmerica-and			'develo	pmen	t			wi	tho	out
the-Caribbean.			carbon'	. This	repor	t lo	oks	3		
			specific	cally	•		at			the
			prospec	ets	for	lo	w-c	arb	on	П
		39								

			energy	develop	ment	in		
			Latin A	merica	and	the		
			Caribbea	an (LAC),	focusin	g		
			on hydro	electric p	ower			
	2011	Clancy,-J	This pa	per	looks	at		
ENERGIA-News			ENERG					

					l -				
				of	ge	nder	tool	S	and
				trainir	1g	work	shop	os	that
				have		enab	led	netwo	ork
				memb	ers	s and	gove	rnmen	nt
				officia	als	to co	nduc	t gend	er
				audits	of	ener	gy po	olicies	T
		2011	Bassi,-AM	This	his paper, through f				
Regional-				integr			studie		
Environmental	_				estigates whether				
Change				contex			ıg	energ	
								vant to	
				suppo					
				formu	ılat	ion			and
				evalua	atio	on	and	provi	des
				insigh	ıts	into		how	to
				opera	tio	nalize	<del>)</del>		the
				conte	xtu	alizat	ion		
Energy	water	2011	Escobar,-M;	This r	en	ort fo	cuse	s on th	<u>e</u>
climate-plannir	l .	2011	Lopez,-	third	Г	optio		findin	
for-developmen			FF; Clark,V	energy	v	sour		that	emit
without-carbon			TT, Clarity.			ı			1
Latin-America-				little or no carbon, called 'development without					
the-									
Caribbean.				carbon'. This report looks					
				specifically at					the
			40						

	prosp	ects for low-carbon	
	energy	development	in

			Latin	Α	merio	ca	and	the		
			Caribbean				(LAC)	,		
			focusing		on h	ydroele	ectric			
			power							
Engrav	2012		The		nraga	nt.	nonor			
Energy Oxford	2012	Drandani C:	discusses		prese	the	paper	o.f		
Oxford		Brandoni,-C;		1.		I	role	of		
		Polonara,-F	municipal p	)ia:				1		
			context	<u> </u>	of	the	regiona			
			energy-plan				process	5		
			based on t							
			derived from	m	12 mι	ınicipal				
			energy		plans	devel	oped			
			for urban ar	rea	s loca	ited in				
			Marche	1	Regi	on,	in	the		
			centre	o	f	Italy,	whose			
			inhabitants				represe	ent		
			approximat	ely	y 40%	of the				
			whole region	n						
Б .	2012			C	.1					
Energies	2012		The aim of							
		Szlavik,-J;	paper is t	0	give					
		Csete,-M	overview			about		the		
			climate and	eı	nergy	policy				
			in Hungary	W	ith a s	special				
			focus on the	e n	new er	energy				
			strategy.							
Energies	2012	Lehmann,-P;	This paper of	exa	amine	s how				
		Creutzig,-F;	an EU							
		Ehlers,-M-H;		one	ı	olicies		1		
		Friedrichsen,-N;	should	r	be	design	ned	to		

	Heuson,-C;	facilitate a	carbon	lock-	
	Hirth,-L;	out.			
	41				

		Diotzalzan D				
		Pietzcker,-R				
Energy policy	2012	Kgathi,-D-L;	This	paper	assesses	the
		Mfundisi,-K-B;	potenti	al of the ir	npacts of	
		Mmopelwa,-G;	biofuel	develo	pment	on
		Mosepele,K	food se	curity in E	Botswana.	
Energy policy	2012		This	article	investiga	ates
		Li-Jun; Wang-	the	major	energy	and
		Xin	climate			
			specific	ed in the 1	2th FYP	
			to gair	insights	into the	
			nature	and	magnitude	of
			challen	ges and di	fficulties	
			with re	gard to the	medium	
			and	long	run econo	omic
			and		environme	ental
			policie	S		
Energy oxford	2012	Kim SeungHyok;	То	handle	uncertainti	ies,
		Koo-JaMin; Lee-	the con	ncept of the		
		ChangJun;	rate w	as adopted	d in this	
		Yoon-EnSup	study s	o as to cor	npute the	
			costs o	f energy sy	stems in	
			the	future	and	Monte
			ition	was		

			performed	d.		
Energy Used Agriculture:	in					
Source	Year	Author		Key po	oints	
	2006	Sanjay-Khar;	Т	his	study	was
Environment- and-		Dhar,-L-N;	C	onducted	l to exami	ine
Ecology		Thusoo,-R-K;	tł	ne		energy
		Sanjay-Dhar	C	onsumpt	ion	pattern
			o	f small fa	arms with	ı a
			v	iew of	suggest	ting a
		42				

			Prope	er	Tec	hn	ological
			mix	to	repl	ace	the
			traditio	na	l pra	ctio	ees
	2006		Α.	a4			
	2006		A	Stu	ıdy	H	was
Agricultural-		Jekayinfa,-S-O	conduc	tec	l		to
Engineering-			determ	and	an	alyse	
International			the patt	n of en		energy	
			utilization in				all
			section	S	of	S	some
			selecte	d	med	ha	nized
			farms		in	92	South-
			western	n	part		of
			Nigeria	ì			
	2007		This	pa	per	ex	plores
Energy-		Couvreur,-J-P	some			pc	ssible
Oxford			approa	approaches			to

			optimize			farm		
			mechaniz	ation	1			
	2007		The basic	pur	pose	of		
Energy-		Singh,-H; Singh,-		the present study is to				
Oxford		K; Kushwaha,-H	optimize energy us			use		
		Amit-Singh	patterns	patterns of diff				
			wheat		gro	wing		
			regions		(We	estern		
			Rajasthar	ınjab,				
			Uttar Pr	(UP)				
			and Mad	hya	Pr	adesh		
			(MP)) of	the (	Coun	try		
			in order to	o ma	ximi	ze		
			yield					
Agricultural-and-	2008		This	stuc	ły	is		
biosystems-			presented	to	eva	luate		
engineering-for-a-			the energ		nergy			
	43							

sustainable-world-	Bakhoda,-H;	pro	ductivity	y			and		
International-	Abdollahi,-A;	recogni	recognize		recognize			enei	gy
Conference-on-	Almassi,-M;	consumption			pa	ttern	S		
Agricultural-	Nasirian,-N	used in		used in co.		mmo	on		
Engineering,-		method	methods			whe	at		
Hersonissos,- Crete,-		widely	gro	own		in	the		
Greece		north o	of Ahwa	z_on	ie				
		of the most important							
		agricultural centers in							
		Iran							

	2010	A 1 1 A	Tr1		41 .	4 1	1		
	2010	Asakereh,-A;	The ai						
Asian-Journal-of-		Shiekhdavoodi,-M-	were	to	eva	luat	e		the
Agricultural-		J; Safaieenejad,-M	energy	y use i	n org	gani	<u>c</u>		
Sciences			and		con	ven	tio	nal	ı
			farmir	ng	of		le	ntil	in
			Kuhda	asht		cou	nty	I	of
			Iran to	inves	tiga	te th	e		
			efficie	ency		of		ener	gy
			consumption						
			001101111111111111111111111111111111111						l
	2011	Kiani,-S;	This s	This study was carried					l
World-Applied-		Houshyar,-E	out	to	assess th				the
Sciences-Journal			energy	y	consumption				
			of	canola	ı	pro	du	ction	
			in two	regio	ns o	f Fai	S		
			provir	ice, Ira	an		•		
AMA,-Agricultural-	2012		The	resu	lte		re	veale	d
Mechanization-in-	2012	Indra-Mani; Patel,	that	the		ısum	<u> </u>		u
Asia,-Africa-		K		energy		in	ipti	pado	l <sub>v7</sub>
andLatin-America		K	cultiva		<u>y</u>				
andLaun-America						by	ı	smal	
			mediu			and		large	2
			category farmers were						
			32,417.7, 36,471.61,						
			and 36,742.85 MJ/ha,			1			
		44							
	1			noctiv	1	1	1	I	The

		Respe	ctively		The		
		consumption	of direct				
		sources	and	indirec			
		sources of energy was					

					60%			and		409	½,
					respec	tive	ly '	while	e in		
					terms			of	renew	able	
					and		no	n	renew	able	
					source	s of	`ene	ergy,	the		
					observ	ed o	con	sump	otion		
					was		8		and	929	<b>½</b> ,
					respec	tive	ly.				
	2013	Nun	ez,-N	M; Pfister,-	Our re	sult	s sh	ow 1	hat,		
Journal-of-		S;	An	ton,-A;	if	the	•	aim		is	to
Industrial- Ecology			noz,-l		minim	ize					the
			weg,		enviro		enta	1	<u> </u>		
			hler,		impacts of					wa	ter
				all,-J	consumption,				I		the
					energy	7		crop	rotati	ons	
					assesse	ed ii	n th	is stı	ıdy		
					were n	nost	sui	itable	e in		
					basins	in t	he 1	north	east		
					of	Sp	ain.	. In c	ontrast		
					the		en	ergy		cro	ps
					grown	in t	oasi	ns in	the		
					southe	ast			of	Spa	ain
					were		ass	socia	ted		with
					the					gre	atest
					enviro	nme	enta	.1	Т		
					impact	ts.	, ,				
				2.5							<u>.</u>
				35							

			and	Lar	ıd		Ava	ailal	bility
			constra	ints					
Journal-of- Applied-	2008	Njoku,-P-C	The	proble	em		of	wa	ıste
Science-and-			flow	in	ene	ergy		syste	
Technology			plannin	ıg	was		invest		
			by adopting				integr		
			_				gineer		
			approac	eh			8		
Renewable-	2009	Zhang-LiXiao;	An ove				of	en	ergy
Energy.		Yang-ZhiFeng;	consum				ttern		by
		Chen-Bin; Chen-	availab		data	a 	and		the
			analysi	s T					
Renewable-	2009	Giatrakos,-G-P;	This	study		pr	esents		the
Energy		Tsoutsos,-T-D;	sustaina	able		pl	anning		of
		Mouchtaropoulo	some	releva	nt		aspect	S	of
		s,-P-G; Naxakis,-	energy	polic	y		in	rui	al
		G-D;	China a	are pres	sente	ed i	n this		
		Stavrakakis,-G	paper a	a renev	wabl	e-b	ased	1	
			energy		sys	ten	1,	wł	nich
			aims to	fulfil t	he e	lec	tric		
			needs	of the	isla	nd	by		
			replacii	ng	the		existii	ng	
			diesel g	generat	ors v	vitl	n new		
			wind	farms	,	ph	otovol	taic	
			installa	tions a	nd h	ydı	rogen		
			product						
				-					
	2009		The	study		nr	ovides		an

Climate-										
Policy	Suwa,-A	1	insight		j	into			the	
			effectiv			0	<u>f</u>		the	2
			method	ology,				and	<u>d</u>	
	36									
				impl	icatio	ons	С	f		the
				prop	osed	. \	ision	ıs		and
				polic	су ра	cka	ges. A	A se	ries	3
				of innovations are ma						ade,
				including the 'polic'					oac	l
				map'	map' as an			ive	toc	ol
				that 1	links	the	back	cas	sting	g
				fram	ewoi	rk	ano	l st	rate	gic
						scus	sions	<b>5.</b>		
	2009	Borges-	Neto,-M-	This	pape	er in	trodu	ices	the	;
Engenharia-		R; Car	valho,-P-	development of a						a
Agricola		C-M-		com	putat	iona	ıl too	l to	hel	р
				the	ene	rgy	pla	nniı	1g	in
				rural	elec	ctrif	icatio	n	ar	eas
				by	usii	ng	t	he	m	ain
				softv	vare	ava	ilabl	e	on	the
				worl	d m	arke	t or	cite	ed i	in
				scier	ntific	1	iterat	ure,	as	in
				the r	efere	ence	.			
	2010	de Kei	rstead,-J;	This	pap	er	cor	isid	ers	the
Energy-		Schulz,	-N-B	field	of	μ	ırban		ene	rgy
Policy				polic	ey,	a r	egle	cted		yet
				impo	ortan	t top	oic			

			1					
Energy Policy	2010	Hiremath,RB;	Present wor	k us	es go	oal-	ı	
		Bimlesh-Kumar;	programmin	g 1	meth	od	in	
		Balachandra,-P;	order to anal	lyze t	he D	EP		
		Ravindranath,-N-	through	1	botto	ıp		
		Н	approach					
					L	1 1		
37	2010	Hoesen,-J-van;	This paper	desc	cribes	S	a	
Renewable		Letendre,-S	possible	mod	del		for	
-Energy			supporting		r		rural	
			community	energy		1		
			projects	usir	ıg		a	
			Geographic	Info	rmat	ion		
			System (GIS	), wh	ich v	vas		
			used to	dev	elop		an	
			inventory	of	ener	gy		
			resource po	tentia	al	in	a	
			rural Vermo	nt	tow	n	for	
			biomass, wi	nd,	and	so	lar	
			technologies	•				
Journal-of-	2010	Mirzaesmaeeli,-	The objective of the case					
Environmental-		H; Elkamel,-A;	studies is to examine the					
Management		Douglas,-P-L;	economical,		stru	ctuı	ral,	
	1 1	1	i e			1		

Croiset,-E;

Gupta,-M

and environmental

emissions to a

limit.

Effects that would result if

the electricity sector was

required to reduce its CO2

specified

Transactions-of-the-	2011	Zhang-LiXiao;	Based o	n ava	ilabl	e dat	a of	•
Chinese-Society-of-		Hu-QiuHong;	rural en	ergy	consi	ımpt	ion,	
Agricultural-		Wang-ChangBo	the spatial and tempora				al	
Engineering			characteristics of rur					al
			energy consumption					as
			well as the evolvement of					
			rural energy policy   w				we	ere
			analyze	d				
	2011	Park-KyungTae;	This pap	er st	udies	the	cost	t
Energy -		Shin-DonGil;	of en	ergy	(CO	E)		for
Oxford		Yoon-EnSup	several emerging,			fos	ssil	
		38						

			Fuel Power Plants Such as							
			an integ	rated		ga	sification			
			combine	cycle	)	(IGC		C)		
			power p	lant, a	natu	ral	gas	S		
			combine	d	cycle	9	(N	GC	C)	
			power	plan	t,			ano	d	a
			pulveriz		co	al		(P	C)	
			power	t	under			th	ree	
			different	scen	arios	de:	fine	d		
			by	the		In	tern	atio	na	1
			Energy A	Ageno	y (IE	<b>A</b> )	)			
C 1-1 1 i	2011	D-#	T11.:	-4:	- C 41-		.41			
Songklanakarin-	2011	Pattanapongchai,	The obje	ective	oi thi	IS S	stua	y		
Journal-of-Science-		-A;	is to investigate upgrading							
and-Technology		Limmeechokchai	biogas with a selected					ted		
		,-B	water scrubbing technique							

			featuring least-cost energy								
			plannin		COS			<i>y</i>			
	2011	Domac,-J;	This	paper	disc	uss	ses			the	
Biomass-and-		Segon,-V;	method	lologic	al		app	oro	ach	l	
Bioenergy		Przulj,-I; Rajic,-	to loca	l ener	gy		pla	nni	ng		
		K	propose	th	e	au	thc	ors			
			and	identi	fies		the	;	m	ost	
			importa	ant	driv	ers		fo	r	its	
			applica	tion at	the r	egi	ona	1			
			level.								
Energy-water-	2011	Escobar,-M;	This re	port fo	cuses	5 01	ı the				
climate-planning-		Lopez,-F-F;	third	opti					ıdiı	ng	
for-development-		Clark,-V	energy	sourc	es		tha	t	er	nit	
without-carbon-in-			little or	no cai	rbon,	ca	lled				
LatinnAmerica-and			'develo	pment				wi	tho	out	
the-Caribbean.			carbon'. This report looks								
			specific		at			the			
			prospects for low					earbon			
		39									

		energ	y	developi	ment	in
	Latin America and		and	the		
		Caribbea	an (L	AC),focusin	ıg	
		on hydro	elec	tric power		_
2011	Clancy,-J	This	pap	er	looks	at

ENERGIA-Nev	WS			ENERG	IA's		devel	opment		
				of	gen	der	tools	•	and	
				training		works	shops		that	
				have		enable		network		
				members	s and	d gove	rnmen	t		
				officials						
				audits of						
		2011	D : AM					1	C.	
		2011	Bassi,-AM	This	pap	er,	throu	gn I	five	
Regional-				integrate	ed			studies,		
Environmental-	-			investiga	ites			whether	•	
Change				contextu	alizi	ing		energy		
				issues is	(are	) relev	ant to	)		
				support		energ	y pol	icy	1	
				formulat	ion				and	
				evaluatio	on		and	provides		
				insights		into		how	to	
				operation	naliz	ze			the	
				contextu	aliza	ation				
Energy	water	2011	Escobar,-M;	This ren	ort f	ocuses	on the	<u> </u>		
climate-plannin		2011	Lopez,-	third		option		finding		
Cimate-planini	<u>18</u> -		FF; Clark,	tiiitu		орио	1.	mung		
for-developmen	1t-		V	energy		sourc	es	that	emit	
without-carbon	-in-			little or r	10 ca	arbon,	called	I		
Latin-America-	and-			'development				without		
the- Caribbean.				carbon'. This report look				S		
				specifica	ılly			at	the	
			40							

			prospec	prospects for low-carbon						
			energy	de	velopi	nent	in			
			Latin	Am	erica	and	the			
			Caribbe	an		(LA	C),			
			focusing	gon	hydr	oeleci	tric			
			power							
Energy	2012		The	pre	esent	pape	r			
Oxford		Brandoni,-C;	discusse		the	role				
		Polonara,-F	municip	municipal planning in t						
		,	context		the	regio				
			energy-j	olanı	proc	ess				
			based o	n th	result	S				
			derived	fron	12 m	unicij	pal			
			energy	pla	evelop	oed				
			for urba	n are	ated in					
			Marche	Re	gion,	in	the			
			centre	of	Italy,	, wh	ose			
			inhabita	nts		repre	esent			
			approxi	mate	ly 40%	6 of t	he			
			whole re	egior	1					
Energies	2012		The ain	n of	the p	resen	ıt			
		Szlavik,-J;	paper i	s to	give	e an	1			
		Csete,-M	overviev	W	abou	t	the			
			climate	and (	energy	polic	су			
			in Hung	speci	al					
			focus or	focus on the new energy						
			strategy	strategy.						
Energies	2012	Lehmann,-P;	This par	er e	xamin	es ho	W			
- <i>S</i> -~		Creutzig,-F;	an EU		mewc		for			

Ehlers,-M-H;	RES-E support policies							
Friedrichsen,-N;	should	be	designed	to				
Heuson,-C;	facilitate	k-						
Hirth,-L;	out.							
41								

		Pietzcker,-R							
Energy policy	2012	Kgathi,-D-L;	This	paper	assesses	the			
		Mfundisi,-K-B;	potentia	al of the in	npacts of				
		Mmopelwa,-G;	biofuel	on					
		Mosepele,K	food se						
Energy policy	2012		This	article	investigate	25			
Energy pency		Li-Jun; Wang-	the	major	energy	and			
		Xin	climate	targets an					
			specifie	ed in the 12	2th FYP				
			to gain	insights	into the				
			nature	and	magnitude o	of			
			challen	ges and di	fficulties				
			with re	gard to the	medium				
			and	long	run econom	ic			
			and		environment	tal			
			policies	5					
		Kim							
Energy oxford	2012	SeungHyok;	То	handle	5,				
		Koo-JaMin; Lee-	the concept of the learning						
		ChangJun;		as adopted					
		Yoon-EnSup	study s	o as to con	npute the				
			costs of energy systems in						

			the	e	fu	ture	e		and		1	Monte	
			Са	arlo		sir	nulat	tio	on			was	
			pe	rforn	ned	l							
Energy Use Agriculture:	d in												
Source	Year	Author				Ke	y po	) 11	1ts				
	2006	Sanjay-Khar;			T1	his			stud	•		was	
Environment- and-	2000	Dhar,-L-N;					ıcted	1 1	to exa		ine		
Ecology		Thusoo,-R-K;			th							energy	
<u> </u>		Sanjay-Dhar	,		cc	nsı	ımpt	ic	n		pattern		
					of	sm	all f	ll farms with					
					vi	ew	of		sugg	ges	ting	ga	
		42											
				prop	er			t	echn	olo	ogical		
				mix			to	r	eplac	ee	e the		
				trad	itio	nal	prac	eti	ices			,	
	2006			A			stud	lv				was	
Agricultural-	2000	Jekayinfa,-S-C	)	cond	duc	ted		.,				to	
Engineering-								aı	nalys			1.0	
International				the 1					<u>J</u>		ene	ergy	
				utili						ir		all	
				sect				(	of		sor	ne	
				sele	cte	d		r	necha	an	izec	i	
				farn	ıs			i	n		So	uth-	
				west	teri	n		ŗ	art			of	
				Nige	eria	ì							
	2007			This	<u> </u>		pape	er		e	xplo	ores	

Energy-		Couvreur,-J-P	some possible										
Oxford			app	proache	s					to			
			opt	timize						far	m		
			me	chaniza	ation	l							
	2007		Th	e basic	nurr	ose	of						
Energy-	2007	Singh,-H; Singh,-	the present study is to										
Oxford		K; Kushwaha,-H	optimize energy						use	2			
		Amit-Singh	patterns of					di	ffer	ent			
			wheat			gr	owi	ng					
			regions					(V	Vest	ern	<u> </u>		
			Rajasthan,					]	Pun	jab	,		
			Utt	tar	Pra	desł	1			(U	P)		
			and	d Madl	ıya			]	Prac	lesl	1		
			(M	(P)) of t	he C	oun	ıtry						
			in (	order to	max	xim	ize	ze					
			yie	eld									
Agricultural-and-	2008		Th	is		stu	dy			is			
biosystems-			pre	esented	to	ı		ev	alua	ate			
engineering-for-a-			the	<del>,</del>				(	enei	gy			
	43												
sustainable-world-		Bakhoda,-H;	p	roducti	vity		<u> </u>				and		
International-		Abdollahi,-A;	recognize energ				erg	y					
Conference-on-		Almassi,-M;	consumption patterns										
Agricultural-		Nasirian,-N	used in common			1							
Engineering,-			methods of wheat				t						
Hersonissos,-Crete,-			W	widely grown in the				the					

north of Ahwaz\_one

of the most important

Greece

			r	esp	ective	ely.				The
		44								
			and	30	,142.8	S IV.	ıJ/Na	۱,		
			32,417.7, 36,471.61, and 36,742.85 MJ/ha,							
			category farmers were							
			med				and		large	e
andLatin-America					tion		by		sma	
Asia,-Africa-		K	of		energy	У	in		pado	ly
Mechanization-in-		Indra-Mani; Patel,	that		the		sum			
AMA,-Agricultural-	2012		The		resul	lts		re	veale	ed
			pro	/in	ce, Ira	an				
					regio		f Far	S		
			of	•	canola				ction	
Sciences-Journal			ene	rgy	·	con	sum	pti	on	
World-Applied-		Houshyar,-E	out		to	ass	ess			the
	2011	Kiani,-S;	Thi	sst	udy w	vas c	arrie	ed		
			con	sur	nptior	1				
				ficiency of					ener	gy
					inves	tiga	te th	e		
			Kul	ıda	sht		cou	nty	У	of
			farr	nin	g	of	I	le	ntil	in
Sciences			and			cor	vent	tio	nal	
Agricultural-		J; Safaieenejad,-M	ene	rgy	use i	n orş	ganio	2		
Asian-Journal-of-		Shiekhdavoodi,-M-	wer	e	to	eva	luate	e		the
	2010	Asakereh,-A;	The	aiı	ms of	this	stud	y		
			Irar	Į.						
			agri	cul	ltural	cent	ers i	n	1	

consumption of direct

				sourc	es		and		indi	irect	
				sourc				was	11101		
				60%			and		40%	⁄o,	
				respe	ctive	ly v	while	e in	•		
				terms of renew					able		
									able		
				sourc	es of	ene	ergy,	the			
				obser	ved o	cons	sump	otion	,		
				was		8		and	92%	<b>6</b> ,	
				respe	ctive						
	2013	Nune	ez,-M; Pfister,-	Our r	esult						
Journal-of-			Anton,-A;	if	, i					to	
Industrial- Ecology		Muno	oz,-P;	minin	nize					the	
		Helly	veg,-S;	envir	onme	enta	1				
		Koeh	ıler,-A;	impa	cts			of	wat	er	
		Riera	idevall,-J	consu	ımpti	on,				the	
				energ	y		crop	rotati	ions		
				assess	sed in	n thi	is stı	ıdy			
				were	most	sui	table	e in			
				basin	s in t	he n	orth	east			
				of	Spa	in. l	ln co	ntrast,	<u> </u>		
				the		ene	rgy		croj	os	
				grow		oasii	ns in	1			
				southeast of were associated				Spa			
								<del></del>	with		
									grea	atest	
				envir	onme	enta	1				
				impa	ets.				-		