

# Participatory assessment of vulnerability and planning of adaptation to climate change in the Yatenga, Burkina Faso

Working Paper

International Agricultural Programme, ICRISAT

International Agricultural Programme  
International Centre for Research in  
Agriculture, ICRISAT  
Patancheru, Andhra Pradesh  
India



# Participatory assessment to enhance the capacity of institutions to address climate change

of the

the environment, the  
United Nations Security Council

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atouou, doua Saoussa, Soumaoua,  
Saou Josas, Soumaoua, Souadoum, Soucoua





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,45?8F .....  
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A55E8I<4G:BAF 4A7 46EBAL@F.....  
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# ACKNOWLEDGEMENTS

;8 4HG;BEF 8KCE8FF G;8<E :E4G<GH78 GB G;8 CCAF+ CEB:E4@ G;EBH:; "C\*" +A, J;<6; 9HA787 G;8  
, JBE> 4A7 ;8?C87 @4>8 G;<F <A9BE@4G<BA 414<?45?8 BA IH?A8E45<?<GL 4A7 6BC<A: FGE4G8:<8F B9 EHE4?  
6B@@<HA<G<8F GB 6?<@4G8 6;4A:8. / 8 4?FB G;4A> 4?? C8BC?8 4A7 <AFG<GHG<BAF J;B C4EG<6<C4G87 <A G;8  
CEB68FF (I<??4:8 JBE>F;BCF, CEBI<A6<4? JBE>F;BC) G;4G ?87 GB G;<F 7B6H@8AG. (HE G;4A>F :B  
C4EG<6H?4E?L GB C8BC?8 9EB@ G;8 I<??4:8F B9 ,<5G8A:4, \*4@7B??4, %8@AB:B - &BFF<, )45<B 4A7 \$BH5<-  
, ;<BH. / 8 8K08A7 G;8F8 46>ABJ?87:@8AGF GB ?B64? ' (F <A 04G8A:4 )EBI<A68 (B<5<E / "AG8E1<74,  
ADEFAD, A) \* (+ 4A7 F ' '), A4G<BA4? ' (F (C\*ED (, -F\* (A, - BHE><A4 F4FB) 4A7 4?? FGEH6GHE8F  
(C"%++ , / F), C ( 'A+ - \*, D<E86GBE4G8 B9 &8G8BEB?B:L, +)-C)+A, C ( 'EDD) J;B C4EG<6<C4G87 <A G;8  
CEBI<A6<4? JBE>F;BC GB 7<F6HFF G;8 74G4 6B??86G87 <A G;8 9<I8 I<??4:8F. / 8 4E8 G;4A>9H?? GB G;8 G;E88  
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47@<A<FGE4G<BA), 8FC86<4??L G;8 CE8F<78AG B9 G;8 \*8:<BA4? CBHA6<? B9 G;8 'BEG;8EA \*8:<BA, G;8 !<:  
CB@@<FF<BA8E 04G8A:4 )EBI<A68 4A7 G;8 )E986G 4A7 G;8 &4LBE B9 \$BH@5E< 78F8E18 BHE :E4G<GH78  
9BE G;8<E 46G<I8 C4EG<6<C4G<BA 4A7 946<?<G4G<BA. F<A4??L, J8 G;4A> DE. !H58EG '7-494 (H4:4 J;B  
6BAGE<5HG87 GB G;8 F6<8AG<9<6 E8I<8J B9 G;<F 7B6H@8AG. , ;8 4HG;BEF 4E8 FB?8?L E8FCBAF<5?8 9BE 4AL  
8EEBEF G;4G @4L E8@4A.

# NOTE ABOUT THE AUTHORS

+B@74 #46DH8F<sup>4</sup>, 01 B) 1618 (H4:47BH: BH 01, BHE><A4 F4FB; #E(4#28250J5315d(437283JL@0333075 UJT@ (28256 00 T@







D'après le 4<sup>ème</sup> rapport IPCC, 2007, les scénarii futurs du changement climatique pour l'Afrique de l'Ouest indiquent que la variabilité climatique actuellement vécue risque d'augmenter et de s'intensifier.

développement dans la province du Yatenga. Au cours de cet atelier, tous les outils d'analyse de la vulnérabilité et de



EHE4? MBA8 6; 4E4668E<M87 5L 4 +4; 8?<4A 6?<@468 (&A! \* !/DAD"/FA (, 2010). %<18?<; BB7 E8FBHE68F 4E8 78E<187 9EB@ 4: E<6H?GHE8 (68E84?F, @<?8G, FBE: ; H@, 6BJC84 4A7 : 4E78A<A:), ?<18F6B6> (F8@<-AB@47<6 4A7 E4A6; <A:) 4A7 B6; 8E (4E6F4A4? : B?7 @<A<A:, 4E45<6 : H@).

/ <G; 6; 8F8 984GHE8F 4A7 <A G; 8 6BA68K6 B9 6?<@468 6; 4A:8, 46; <81<A: FHF64<A45?8 9BB7 F86HE6L <A 4A 4E84 J<G; ; <: ; CBCH?46BA :EBJG; <F 4 @4-BE 6; 4?8A:8. A74C646BA 4A7 @<: 46BA B9 F6E468 :<8F 9BE 6?<@468 6; 4A:8 G; 8A 586B@8 8FF8A6<4? 46 4?? ?818?F 4A7 C4E66H?4E?L 46 G; 8 ?B64? ?818?, J; 8E8 CB18E6L <F @BF6 CE814?8A6 4@BA: CBCH?46BAF. BH6 G; 8 FH668FF B9 @<: 46BA 4A7 474C646BA F6E468 :<8F 6B 6?<@468 6; 4A:8 J<? <AIB?18 6; 4A:8F <A G; 8 58; 41<BHE B9 466BEF, <A 686; AB?B: <8F 4A7 <AF6GH6BAF CHG <A C?468 4A7 G; 8 6HEE8A6 9BB7 CEB7H66BA FLF68@F. , ; 8F8 6; 4A:8F G; 8@F8?18F A887 6B 58 C?4AA87, @BA6BE87 4A7 814?H4687 6B 8AFHE8 G; 8L 4E8 <A ?<A8 J<G; G; 8 474C646BA 4A7 / BE @<: 46BA B9 6?<@468 6; 4A:8.

, ; 8 466BEF G; 8A A887 6B <@CEB18 G; 8E 64C466L 9BE C?4AA<A:, @BA6BE<A: 4A7 814?H46BA B9 G; 8 E8DH<E87 6; 4A:8F <A G; 8E 58; 41<BEF, 686; AB?B: <8F G; 8L HF8, <AF6GH6BAF 4A7 G; 8E 9BB7 CEB7H66BA FLF68@F. "@CEB1<A: G; 8 64C466L B9 466BEF E8DH<E8F G; 8 7818?BC@8A6 B9 4 A8J 4CCEB46; 9BE C?4AA<A:, @BA6BE<A: 4A7 814?H46BA. , ; <F A8J 4CCEB46; @HF6 CEB@B68 G; 8 899866<18 <AIB?18@8A6 B9 4?? F64>8; B?78EF <A G; 8 C?4AA<A: 6L6?8 4A7 @BA6BE<A: 4A7 814?H46BA B9 E8F84E6; 4A7 7818?BC@8A6. , ; 8 ) 4E6<6C46BEL A66BA-?84EA<A: 4CCEB46; 64A G; 8E89BE8 8A; 4A68 G; 8 F>??F B9 F64>8; B?78EF 9BE C?4AA<A:, @BA6BE<A: 4A7 814?H46BA B9 474C66<18 64C466L.

, ; 8 HF8 B9 FH6; 4A 4CCEB46; <F 8KC86687 6B <@CEB18 HA78EF64A7<A: B9 G; 8 <@C?<646BAF B9 6?<@468 6; 4A:8 BA G; 8 ?<18F 4A7 ?<18?<; BB7F B9 C8BC?8 <A G; 8 0468A: 4 E8: <BA <A : 8A8E4? 4A7 <A G; 8 <A68E18A6BA F68F B9 G; 8 (CCAF+) CEB: E4@ <A C4E66H?4E. A?? G; <F 6BH?7 ; 8?C 58668E <78A669L 4A7 68F6 686; AB?B: L 4A7 : BB7 CE46668F 9BE 474C646BA 4A7 @<: 46BA 6B 6?<@468 6; 4A:8 <A BE78E 6B <A9?H8A68 A46BA4? CB?<6<8F. , ; 8 E8F84E6; DH8F6BAF 4E8 4F 9B??BJF : (1) C4A G; 8 <AIB?18@8A6 B9 F64>8; B?78EF <A G; 8 HF8 B9 6BB?F 9BE C?4AA<A:, @BA6BE<A: 4A7 814?H46BA 9BF68E 6; 4A:8F <A 58; 41<BHE, E8?46BAF; <CF 4A7 466BAF 6B 474C66 6B 6?<@468 6; 4A:8? (2) !BJ 7B EHE4? 466BEF @4>8 HF8 B9 G; 8F8 6BB?F?

## II. METHOD





A 54F8?A8 FHEI8L 6BA7H6G87 <A G; <F 4E84 F; BJ87 G; 4G 4: E6H?GHE8 E8@4AF G; 8 @4A 86BAB@6 CEB7H6G&BA 46G&I&L 4A7 EHE4? ; BHF8; B?7F @4A?L 78C8A7 BA <G 9BE G; 8<E ?<I8?<; BB7 (+B@O 8G 4?, 2011). A66BE7<A: GB G; 8 F4@8 FGH7L, G; 8 @4-BE&GL B9 ; BHF8; B?7F (74%) <A G; 8 CEB: E4@ <AG8E18AG&BA 4E84 9468 9BB7 <AF86HE&GL , ; <F 5E<A: F G; 8@ GB 47BCG A8J 4GG&GH78F <A G; 8 @4A4: 8@8AG B9 6EBCF, 94E@<A: CE46G&68F 4A7 HF8 B9 9BE8FG : BB7F 4A7 F8EI<68F. DE<I<A: 946G&BEF (BE GE<: : 8EF) B9 G; 8F8 58; 4I<BE4? 6; 4A: 8F 4E8 4@BA: BG; 8E 6?<@4G8 I4: 4E<8F, @4E>8GF, 4: E6H?GHE4? ?4A7, ?45BE, C8F&F/7<F84F8F 4A7 8K&8EA4? <AG8E18AG&BAF 5L CEB-86GF. , ; 8F8 946G&BEF 4E8 E8CBE&87 5L 80% B9 ; BHF8; B?7F FHEI8L87 (+B@O 8G 4?. 2011), 4F >8L 946G&BEF <A G; 8 B66HEE8A68 B9 6; 4A: 8F <A 4: EB-FL?IB-C4F&BE4? CEB7H6G&BA FLF&8@F <A G; 8 4E84.

, ; HF, G; 8 <@C46G B < CEG G; 8 , G; 8 <AG8E18AG&B8 4 8B EIE , G; 8 E4 8C C4 G











b): Participatory mapping of resources and climate change hazards as perceived by Tibtenga women

Figure 3: Participatory maps of key resources and climate hazards in Tibtenga, Yatenga, Burkina Faso.

, ; 8 C4EG6:C4GBEL @4CC<A: B9 E8FBHE68F 4A7 6?<@4G8 ; 4M4E7F FH : : 8FGF G ; 4G @8A 4A7 JB@8A <A 9<18 6B@@@HA<8F ; 418 CB<AGF B9 6BA18E:8A68 4A7 7<18E:8A68. , ; HF, 4@BA: G ; 8 9BHE @BFG <@CBEG4AG A4GHE4? E8FBHE68F, 4:E6H?GHE4? ?4A7F 4E8 8DH4??L <@CBEG4AG 9BE @8A 4A7 JB@8A. / ; ?8 ?<18FGB6> 4A7 C4FGHE8 ?4A7F F88@ @BE8 <@CBEG4AG 9BE @8A, 9H8? JBB7 <F 6BAF<78E87 @BE8 <@CBEG4AG 5L JB@8A. "A G8E@F B9 C; LF-64? E8FBHE68F, @8A 4A7 JB@8A ; 418 8DH4??L <78AG<87 J4G8E <A9E4FGEH6GHE8. A:E6H?GHE4? 8DH<C@8AG 4A7 @BFDH8F (<@CBEG4AG 9BE CE4L8EF GB 4F> B7 9BE @BE8 941BE45?8 6?<@4G6 6BA7<G<BAF) ; 418 588A <78AG<87 5L @8A, J ; 8E84F JB@8A ; 418 E898EE87 GB ; BHF8F.

, ; 8 4A4?LF<F B9 G ; 8 IH?A8E45<?GL @4GE<K 9BE ?<18? ; BB7 E8FBHE68F F ; BJF G ; 4G G ; E88 6?<@4G8 ; 4M4E7F (7EBH : ; G, FGEBA: J<A7F 4A7 9?BB7F) 4E8 6BAF<78E87 5L @8A GB 58 G ; 8 @BFG <A9?H8A6<A: BA G ; 8 6B@@@HA<GL E8FBHE68F. ( A G ; 8 B9 ; 8E ; 4A7, JB@8A <78AG<87 7EBH : ; G 4A7 FGEBA: J<A7 4F G ; 8 @BFG <A9?H8A6<A: . BBG ; : EBHCF 4E8 HA4A<@BHF G ; 4G 7EBH : ; G <F G ; 8 @BFG <@CBEG4AG 5L <G F 78 : E88 B9 <A9?H8A68 BA G ; 8 E8FBHE68F, 9B??BJ87 5L FGEBA: J<A7F. "A7887, G ; 8 814?H4G<BA B9 G ; 8 78 : E88 B9 <A9?H8A68 B9 4?? ; 4M4E7F BA E8FBHE68F (, 45?8 1) HF<A: 4 F64?8 9EB@ 0 GB 5, F ; BJF G ; 4G A4GHE4? E8FBHE68F, 8FC86<4??L 4:E6H?GHE4? ?4A7, ?<18FGB6> 4A7 C4FGHE8 ?4A7, 4E8 G ; 8 @BFG <A9?H8A687 5L 6?<@4G8 ; 4M4E7F. F<A4A6<4? E8FBHE68F (<A6B@8F 78E<187 9EB@ G ; 8 F4?8 B9 64F ; 6EBCF) 4E8 G ; 8 F86BA7 @BFG <A9?H8A687 E8FBHE68F 5L 6?<@4G8 ; 4M4E7F. / 4G8E <A9E4FGEH6GHE8 (J8??F 4F C; LF-64? E8FBHE68) 4A7, GB 4 ?8FF8E 8K68AG, E818AH8F 9EB@ G ; 8 F4?8 B9 : B?7 4E8 4?FB <@CBEG4AG?L 49986G87 5L 6?<@4G8 ; 4M4E7F.



3.2.1. D/, 2%&1 a+" 1&# /#)a1#" a"a-1a1', + 01/a1#%'#0

, ;8 B5F8E187 <@C460F B9 7EBH: ;G 5L @8A 4E8 G; 8 786%A<A: B9 4:E<6H?GHE4? CEB7H6G<BA, J408E F64E6<GL 4A7 G; 8 78:E474<BA B9 C4FGHE8F. CHEE8A0 E8FCBAF8F 78F6E<587 5L @8A 6BAF<FG B9 5HL<A: 9BB7FGH99 J<G; <A6B@8 9EB@ GE478, B18E- 7<: <A: J8??F, G; 8 6B@5<A87 9887 E4G<BA<A: 4A7 G; 8 HF8 B9 4:EB-<A7HFGE<4? 5L-CEB7H6GF (+)A") 4A7 6EBC E8F<7H8F 9BE ?<18FG6>, E8FC86G<18?L , ; 8L 7<7 ABG <78A<9L 4?G8EA4<18 E8FCBAF8F GB 5HL<A: 9BB7 J; 8A 4:E<6H?GHE4? CEB7H6G<BA 7EBCF 7BJA 4F 4 6BAF8DH8A68 B9 G; 8 7EBH: ;G. , ; 8L E8CBEG87 4?G8EA4<18 FGE4G8:<8F GB 9887 E4G<BA<A: 9BE ?<18FG6> 4A7 GB B18E-7<: <A: B9 J8??F. "A G; 8 9<EFG 64F8, G; 8L E8CBEG87 G; 8 HF8 B9 9B778E GE88F 4F 4A 4?G8EA4<18 GB 9BB7 E4G<BA<A: 9BE ?<18FG6>. BHG, G; 8 89986G<18 47BCG<BA B9 G;<F 4?G8EA4<18 <F 6BAFGE4<A87 5L G; 8 9BE8FG ?8:<F?4G<BA J; <6; CEB; <5<GF G; 8 6HGG<A: B9 GE88F. FBE G; 8 B18E-7<: <A: J8??F, 4?G8EA4<18 <78A<9<87 5L G; 8 6B@@<HA<8F <F G; 8 5BE8; B?8F. BHG G; 8 ?46> B9 9<A4A6<4? E8FBHE68F 4A7 C4EGA8EF CE818AGF G; 8@ GB C8E9BE@ 7E??<A:.

FEB@ G; 8 JB@8A C8EFC86G<18, G; 8 B5F8E187 <@C460F B9 7EBH: ;G 4E8 G; 8 786%A<A: B9 4:E<6H?GHE4? CEB7H6G<BA, J408E F64E6<GL 4A7 G; 8 78:E474<BA B9 C4FGHE8F. CHEE8A0 E8FCBAF8F 78F6E<587 5L @8A 6BAF<FG B9 5HL<A: 9BB7FGH99 J<G; <A6B@8 9EB@ GE478, B18E- 7<: <A: J8??F, G; 8 6B@5<A87 9887 E4G<BA<A: 4A7 G; 8 HF8 B9 4:EB-<A7HFGE<4? 5L-CEB7H6GF (+)A") 4A7 6EBC E8F<7H8F 9BE ?<18FG6>, E8FC86G<18?L , ; 8L 7<7 ABG <78A<9L 4?G8EA4<18 E8FCBAF8F GB 5HL<A: 9BB7 J; 8A 4:E<6H?GHE4? CEB7H6G<BA 7EBCF 7BJA 4F 4 6BAF8DH8A68 B9 G; 8 7EBH: ;G. , ; 8L E8CBEG87 4?G8EA4<18 FGE4G8:<8F GB 9887 E4G<BA<A: 9BE ?<18FG6> 4A7 GB B18E-7<: <A: B9 J8??F. "A G; 8 9<EFG 64F8, G; 8L E8CBEG87 G; 8 HF8 B9 9B778E GE88F 4F 4A 4?G8EA4<18 GB 9BB7 E4G<BA<A: 9BE ?<18FG6>. BHG, G; 8 89986G<18 47BCG<BA B9 G;<F 4?G8EA4<18 <F 6BAFGE4<A87 5L G; 8 9BE8FG ?8:<F?4G<BA J; <6; CEB; <5<GF G; 8 6HGG<A: B9 GE88F. FBE G; 8 B18E-7<: <A: J8??F, 4?G8EA4<18 <78A<9<87 5L G; 8 6B@@<HA<8F <F G; 8 5BE8; B?8F. BHG G; 8 ?46> B9 9<A4A6<4? E8FBHE68F 4A7 C4EGA8EF CE818AGF G; 8@ GB C8E9BE@ 7E??<A:.

Table 2: Observe a ts o o ja elate a a ap states

Observe r r	r e e s	rs reve s r e
e		
Decrease in agricultural production	Buying foodstuff with money from various petty trading (BF)	No preventing factor was identified
Water shortage	Building boreholes (BB)	Insufficient financial resources.
Degradation of grazing lands	Valuing fodder Trees(VFT)	Inappropriate legislation.
e		
Decrease in agricultural production	Use improved/adapted seeds (UI/AS)	Low availability of adapted seeds.
Water shortage	Increase the availability of water resources (IAWR)	Insufficient material and technical assistance.
Mortality of trees	Development of farm lands and assisted natural regeneration (DFL&ANR)	Insufficient technical and material assistance.

o b: - ea statte o n o t e p e t s a t la es eo n p as o n t  
M Ma o n n a b t o s

Source: Community groups discussion 2 2



### 3.2.2. S1/,+% 4'+ " a+ " 1&# /#)a1#" a"a-1a1', + 01/a1#%'#0

%>8 9BE G; 8 7EBH : ; G, G; 8 B5F8E187 <@C46GF B9 FGEBA: J<A7 (,45?8 3) 4E8 7<998E8A6 78C8A7<A: BA G; 8 :8A78E-54F87 :EBHC. "A G; 8 @8A :EBHC @4AL B5F8E187 <@C46GF B9 FGEBA: J<A7 J8E8 E86BE787, <A6?H7<A: G; 8 786?<A8 <A 9EH<G CEB7H6<BA, G; 8 786?<A8 <A 4 :E<6H?GHE4? CEB7H6<BA, HCEBB<A: B9 6E88F, 4A7 G; 8 78F<GEH6<BA B9 ; BHF8F 4A7 G; 8 784G; B9 4A<@4?F. A@BA: G; 8 B5F8E187 <@C46GF 5L JB@8A, GJB 4E8 F<@<?4E GB G; BF8 B9 @8A (HC EBB<A: B9 ; BHF8F 4A7 HCEBB<A: B9 6E88F), J ; <?8 G; 8 G; <E7 4CC84EF GB 58 FC86<64?L B5F8E187 5L JB@8A (94?<A: B9 6EBCF).

A74C<4<BA FGE4<8 :<8F <@C?8@8A<87 5L @8A 4:4<AFG G; 8 B5F8E187 <@C46GF B9 FGEBA: J<A7 4E8:

- n The development of farm land associated with assisted natural regeneration GB 9<: ; G 4:4<AFG G; 8 786?<A8 <A 9EH<G CEB7H6<BA 4A7 HCEBB<A: 6E88F;
- n The purchase of food using incomes from petty trading GB @4A4:8 G; 8 786?<A8 <A 4:E<6H?GHE4? CEB7H6<BA,
- n Strengthening of houses designed with local materials GB CE818A<G G; 8 78F<GEH6<BA B9 ; B@8F 4A7,
- n The increased surveillance of animals GB E87H68 G; 8<E 784G; .

+B@8 B9 G; 8F8 FGE4<8 :<8F ; 418 588A 9BHA7 GB 58 <A89986<18 4A7 HAFHF<4<A45?8 4A7 4?G8EA4<18F ; 418 588A <78A<G<87. , ; HF, G; 8 FGE8A : G; 8A<A: B9 5H<?7<A: F 78F<: A87 J<G; ?B64? @4G8E<4?F J4F 6BAF<78E87 <A899<6<8A<G 4A7 HAFHF<4<A45?8 5864HF8 ?B64? @4G8E<4?F 64AAB<G J<G; FG4A7 G; 8 J<A7 9BE ?BA: . , ; 8 6BAF<GEH6<BA B9 5H<?7<A: F J<G; C8E@4A8A<G @4G8E<4?F J4F G; 8A <78A<G<87 4F 4A 89986<18 4A7 FHF<4<A45?8 4?G8EA4<18. !BJ818E, G; 8 ?46> B9 9<A4A6<4? E8FBHE68F CE818A<G G; 8@ HF<A: FH6; @4G8E<4?F 9BE E8F<78A<G<4? 5H<?7<A: F. %>8 J<F8, <A6E84F87 FHE18<?4A68 B9 4A<@4?F J4F <A899<6<8A<G 4A7 HAFHF<4<A45?8 4:4<AFG 4A<@4? @BE<4?<G; 4A7 G; 8 6BAF<GEH6<BA B9 ; 45<4G F J4F <78A<G<87 4F @BE8 89986<18 4A7 FHF<4<A45?8. !BJ818E, G; 8 6BAF<GEH6<BA B9 ; 45<4G F E8DH<E8F 9<A4A6<4? E8FBHE68F G; 4G 4E8 788@87 <AFH99<6<8A<G 4G G; <F G<@8 5L G; 8 6B@ @HA<G<8F.

FEB@ G; 8 JB@8A C8EFC86<18, 6BC<A: FGE4<8 :<8F 6HEE8A<G?L <@C?8@8A<87 GB 477E8FF G; 8 G; E88 @4<A <@C46GF B9 FGEBA: J<A7 4E8 GB :EBHC<A: 6B@ @HA<G; BHF8F GB E87H68 HC-EBB<A: , C?4A<A: 474C<87 6E88 FC86<8F GB CE818A<G G; 8<E HCEBB<A: 4A7 CE46<6<A: ; ?<A: B9 6EBCF 4:4<AFG 94?<A: 7BJA. , ; 8 4FF8FF@8A<G B9 G; 8F8 FGE4<8 :<8F ; 4F F; BJA G; 4G G; 8L J8E8 AB<G 89986<18 4A7 FHF<4<A45?8. AF 4A 89986<18 4A7 FHF<4<A45?8 FGE4<8 :L GB E87H68 ; BHF8F HC-EBB<A: <F G; 8 FGE8A : G; 8A<A: B9 G; 8 ; BHF8FV EBB9F. , B 89986<18?L 4A7 FHF<4<A45?L 9<: ; G 4:4<AFG G; 8 94?<A: B9 6EBC 64HF87 5L FGEBA: J<A7, JB@8A ; 418 <78A<G<87 G; 8 7818?BC@8A<G B9 4:E<6H?GHE4? ?4A7 6B@5<A87 J<G; 4FF<F<87 A4GHE4? E8:8A8E4<BA. BHG G; 8 47BC<BA B9 G; <F BC<BA <F 6BAF<GE4<A87 5L G; 8 ?46> B9 686; A<64? 4FF<F<4A68 4A7 8DHC@8A<G.





( A68 0 ; 8 ; 4M4E7F, 0 ; 8<E <@C460F 4A7 08EE<0BE<4? <A9?H8A68 4E8 >ABJA, <0 <F <@CBEE04A0 0B AB08 0 ; 40 BA8 474C040BA  
F0E408



Table 6: Assessment of climate change resource availability and adaptation strategies by crop

Climate hazards	Drought				Strong wind			
	DFL/ ANR	IAWR	I/A	Total	R	A	DFL/ ANR	Total
<b>Natural resources</b>								
F								
F f								
<b>Physical resources</b>								
W f								
<b>Financial resources</b>								
A f								
I f								
A f								
<b>Human resources</b>								
f								

DFL/ANR = development of farm lands /assisted-natural regeneration; IAWR = Increasing water the availability of resources; UI/AS = Using of improved/adapted seeds; SHR = Strengthening houses' roofs with adapted materials; PAS = Planting adapted species.



50% B9 ;BHF8;B?7 E8FBHE68F 4E8 8KCBF87 GB 9?BB7, 5HG 30% 4E8 F8AF<18. , ;8 @4<A E84FBA J;L 4  
 ;BHF8;B?7 <F F8AF<18 GB 4 ;4M4E7 <F @4<A?L 7H8 GB G;8 946G G;4G @H6; B9 <GF E8FBHE68F 4E8 HA78E G;8 G8EE<GBE<4?  
 6BAGEB? B9 G;8 ;4M4E7 4:4<AFG 4 F@4?? CEBCBE<BA BHGF<78 <GF 6BAGEB?. , ;8 F86BA7 E84FBA :<18A E8:4E7<A: G;8  
 F8AF<1<GL <F G;4G G;8 414<?45?8 6EBC 14E<8<8F 4E8 ABG 474C<87 GB G;8 ;4M4E7 4A7 G;8E89BE8 64AABG E8F<FG GB <GF  
 89986GF.

**Table 8: Perceived level of households' vulnerability to climate hazards by men group**

C□ .	Observed key impacts	% of households exposed	% of households impacted
□	□ □	--	--
	□	-	4
		--	-
□	□ □	--	-
	□	-	-
		-	-
□	□ □	-	-
		4	-
	□ □ □ □	-	-

S J mmu Jp J 2 2

(G;8E < x

(G;8









4.2. C&a))#+%#0 , \$ 1&# #&a3' , 2/a) !&a+%#0 1, a!&'#3# 1&# 3'0' , +

, ; 8 6 ; 4??8A : 8F 9BE G ; 8 58 ; 4I<BE4? 6 ; 4A : 8F (BE BH06B@8F 6 ; 4??8A : 8F) 4F E8CBEG87 5L G ; 8 C4EG8EF 4E8 788@87  
GB 58 <A9?H8A687 5L G ; 8 CEB : E4@@@8. , ; 8L 78F6E<58 ; BJ 58 ; 4I<BE, E8?4G<BAF ; <CF, 46G<I<G<8F BE 46G<BAF B9 4 C8EFBA,  
: EBHC BE <AFG<GHG<BA J<?? 6 ; 4A : 8 <G G ; 8 CEB : E4@@@8 <F I8EL FH668FF9H? (E4E? 8G 4?, 2002). , ; 8L 4E8 F04G87 5L 846 ;  
: EBHC B9 C4EG8EF 4A7 I4?74G87 5L B0 ; 8E : EBHCF J<G ; G ; 8 94G<?G4G<BA B9 G ; 8 E8F84E6BA I4 <B<83 . 0 . 2528371000?210/888000



Ta )# 12: A!1', +0 a+ " -a/1+#/0&' - \$, / a"a-1a1', + '+ /#)a1', + 1, +a12/a) /#0, 2/!#0

Ob		

Decrease a r c. ara  
 f r c (cr f ss  
 f a f cr f f  
 f a s e c

+BHE68: +HCE4-6B@@HA<L JBE>F;BC B9 G;8 CCAF+ 5BHA74EL C4E0A8EF (2012)

,45?8 13 F;BJF G;8 <78AG<9<87 CE<BE<L 46<BAF 4A7 C4E0A8EF;<CF A88787 GB E87H68 G;8 A8:4<I8 899860F B9 6?<@408  
 ;4M4E7F BA F0EH60HE<A: E8FBHE68F: C;LF<64?, 9<A4A6<4?, ;H@4A 4A7 FB6<4?. "G F;BH?7 58 AB087 G;4<A G;<F :EBHC B9  
 E8FBHE68F, 6B@@HA<0<8F BA?L E8CBE087 B5F8E187 <@C460F B9 6?<@408 14E<45<?<L BA C;LF<64? E8FBHE68F. ' B  
 B5F8E187 <@C460 J4F E8CBE087 BA G;8 9<A4A6<4?, FB6<4? 4A7 ;H@4A E8FBHE68F, 5HG G;8<E 6HEE8AG ?818? J4F 788@87  
 <AFH99<6<8AG GB FHCCBE0 G;8 46;<818@8AG B9 G;8 FG4087 I<F<BA. , ;8E89BE8, 46<BAF 4A7 C4E0A8EF;<CF 4E8 4?FB A88787  
 GB <@CEB18 G;8 6HEE8AG FG40HF B9 G;8F8 E8FBHE68F FB G;4G G;8L 899860<I8?L 6BAGE<5H08 GB G;8 FG4087 I<F<BA.



# V. CONCLUSION

; 8 8K<F8A68 B9 7<18EF8 474C64G<BA 6BA68KGF <@C?8F G; 4G G; 8E8 <F AB BA8 4CCEB46; GB 4FF8FF, C?4A 4A7  
, <@C?8@8AG 474C64G<BA @84FHE8F (FHFF8? , 2007). BHG J ; 46818E 4CCEB46; <F HF87, 466BEF @HFG >88C <A @<A7  
G; 8 A887 GB (4) 7868AGE4?M8 G; 8 CEB68FF, (2) CEB@B68 <A6?HF<18 786<F<BA G; EBH: ; C4EG<6<C4GBEL C?4AA<A: 4A7 (3)  
GB 5BBFG G; 8 46G<BA G; EBH: ; 87H64G<BA 4A7 4J4E8A8FF. , ; 8 4CCEB46; 4A7 GBB?F 4CC?<87 <A G; 8 9<18 EHE4?  
6B@@<HA<G<8F B9 G; 8 ,BH: BH 5?B6> <A BHE><A4 F4FB ; 418 G; 8F8 G; E88 6; 4E4668E<F<6F. "A 946G, G; 8 C4EG<6<C4GBEL  
4CCEB46; 5H?G BA : 8A78E-54F87 : EBHCF 9EB@ BA8 6B@@<HA<GL ?818? GB CEBI<A6<4? (FHCE4-6B@@<HA<GL) ?818? J4F  
; 8?C9H? GB HA78EF64A7 G; 8 FC86G<6<GL 58GJ88A JB@8A 4A7 @8A J<G; E8: 4E7F GB G; 8 6?<@468 6; 4A: 8 474C64G<BA  
4A7 G; 8E< @<C?<64G<BAF 9BE 9BB7 F86HE<GL , ; 8 4CC?<87 GBB?F CEB@B68 ?84EA<A: 9BE 4?? F64>8; B?78EF B9 G; 8 CEB: E4@  
BA 6?<@468 6; 4A: 8, 4: E<6H?GHE8 4A7 9BB7 F86HE<GL , ; 8L 946<?<G4687 G; 8 C4EG<6<C4GBEL : 8A8E4G<BA 4A7 4A4?LF<F B9  
<A9BE@4G<BA 45BHG G; 8 IH?A8E45?<GL B9 EHE4? 6B@@<HA<G<8F 4A7 G; 8E HF8 <A C?4AA<A: , @BA<G<BE<A: 4A7 814?H4G<BA B9  
6?<@468 6; 4A: 8 474C64G<18 64C46<GL

, ; E88 @4-BE ?8FFBAF 64A 58 ?84EA87 BA ; BJ 6B@@<HA<G<8F <A 0468A: 4 ; 418 HF87 F<@C?8 GBB?F 9BE C?4AA<A: ,  
@BA<G<BE<A: 4A7 814?H4G<BA B9 G; 8E 64C46<GL GB 474C6G 6B 6?<@468 6; 4A: 8:

n \* HE4? 6B@@<HA<G<8F ; 418 78@BAF6E4687 4 : BB7 HA78EF64A7<A: B9 G; 8 E8?4G<BAF ; <C 58GJ88A 6?<@468 ; 4M4E7F  
4A7 G; 8E B5F8E187 4A7 9H6HE8 <@C466F, 4F J8?? 4F G; 8 ?<@<G F B9 4H6BAB@BHF 474C64G<BA F6E468 : <8F G; 8L ; 418  
<@C?8@8AG87 GB 7468. "9 G86; A<6<4AF 4A7 EHE4? 6B@@<HA<G<8F FC84> G; 8 F4@8 ?4A: H4: 8 BA <FFH8F E8?4687 GB  
6?<@468 6; 4A: 8, G; 8L JBH?7 58 45?8 GB F; BJ G; 4G G; 8 ?818?F B9 8KCBFHE8 4A7 F8AF<I<GL B9 4: E<6H?GHE4?  
CEB7H6G<BA 4E8 ABG G; 8 F4@8 <A EHE4? 4E84F. , ; 8E89BE8, G; 8 IH?A8E45?<GL <F ABG ; B@B: 8A8BHF 4A7 <AG<AF<6  
6; 4E4668E<F<6 B9 4 : <18A F866BE, 5HG <F 9HA6G<BA B9 5B6; G; 8 ?818? B9 8KCBFHE8, F8AF<I<GL 4A7 G; 8 64C46<GL B9  
466BEF GB <@C?8@8AG 474C687 G86; AB?B: <8F;

n \* HE4? 6B@@<HA<G<8F ; 418 F; BJA G; 4G <A 477<G<BA GB <@C?8@8AG<A: 4H6BAB@BHF (FCBAG4A8BHF) 474C64G<BA  
F6E468 : <8F, G; 8L ; 418 G; 8 64C46<GL GB C?4A 9BE 474C64G<BA. "A C4EG<6H?4E, J; 8A G; 8 C?4AA<A: GBB?F 4E8  
FH99<6<8AG?L C4EG<6<C4GBEL, G; 8L 64A 7818?BC 6B; 8E8AG I<F<BA B9 7818?BC@8AG G; 4G G4>8F <AGB 466BHAG 6?<@468  
6; 4A: 8 474C64G<BA. , ; <F I<F<BA E8CE8F8AGF G; 8 78F<E87 F<GH4G<BA <A J; <6; G; 8L JBH?7 ?<8 GB 58 78FC<G8 G; 8  
6?<@468 ; 4M4E7F. , ; 8L 4?FB E84?M8 G; 4G 9BE G; 8 6; 4A: 8 <A G; 8E 6HEE8AG F<GH4G<BA GB ; 4CC8A, G; 8L A887 GB  
6; 4A: 8 G; 8E 58; 41<BE, E8?4G<BAF; <CF, 46G<I<G<8F 4A7 46G<BAF <A J4LF G; 4G 4E8 941BE45?8 GB G; 8 46; <818@8AG  
B9 G; 8E I<F<BA. , ; <F G4>8F <AGB 466BHAG 47=HFG@8AGF <A G; 8 E8?4G<BAF 58GJ88A 466BEF, 5HG 4?FB <A7<I<7H4?  
47=HFG@8AGF E8: 4E7<A: G; 8 J4LF 818ELBA8 <@C?8@8AG ; <F ( ; 8E) 46G<I<G<8F;

n F<A4?L, EHE4? 6B@@<HA<G<8F ; 418 F; BJA 4J4E8A8FF G; 4G 474C64G<BA GB 6?<@468 6; 4A: 8 J?? ABG 6B@8 BA?L  
9EB@ G; 8 BH6F<78. , ; 8L 4E8 4?FB 4J4E8 B9 G; 8 ?B64? CBFF<5?<G<8F 4A7 6BAF6E4<AGF GB 474C64G<BA GB 6?<@468  
6; 4A: 8. , ; 8L 4E8 ?>8?L GB CEBCBF8 @84FHE8F GB <@C?8@8AG G; 8E 46G<BAF 4A7 FB?<6<G 8K68EA4? FHCCBEG 9EB@  
C4EG



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