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Type 1	Type 2	Туре З	Type 4				
Single-enterprise Farm model:	Multi-enterprise Farm model:	Farm household model (intra and inter- household relations ignored)	Farm household model (only intra-household relations captured)				
Single crop	Multiple crops	Multiple crops	Multiple crops				
Production							
Marketing	Marketing	Marketing	Marketing				
Resources (labor, capital, land, water)	Resources (labor, capital, land, water)	Resources (labor, capital, land, water) Consumption	Resources (male-labour, female-labor, child-labor, capital, land, water) Male and female consumption				
		·	Male income, Female				
Farm Profit	Farm profit	Family Income	income				

BIO-ECONOMIC MODELLING CONT'D							
Type 5	Туре б	Туре 7					
Farm household model (intra-household relations ignored but inter-household relations captured) Multiple crops	Farm household model (intra and inter household relations captured) Multiple crops	Variant of Type 3 (with feed back loop to resource base) Multiple crops					
Marketina	Marketina	Marketina					
Resources (family resources, community resources) Consumption	Resources (female labor, male labor, family resources, community resources) Consumption	Changes to resources (family (male- labor, female-labor, child-labor), family (capital, land, water), community(capital, land, water) Consumption					
Family income, social benefit	Male income, female income, social benefit	Male income, Female income, social benefit					







PRACTICE BIO-ECONOMIC CONT'D

PRACTICE 1: START WITH A SINGLE-ENTERPRISE FARM MODEL (TYPE 1) – EXCEL/GAMS

- YIGEZU FAMILY FARM PRODUCES ONLY WHEAT AND THE PRODUCTION FUNCTION IS:
- Y = 250 + 10*X -0.006*X² + 0.000001*X³ (BIOPHYSICAL RELATIONSHIP)

ECONOMIC CONSIDERATIONS

- MARKET PRICE OF WHEAT = 300 SYL/KG
- PRICE OF FERTILIZERS = 800 SYL/KG
- TOTAL CAPITAL OF THE FARM IS 600,000 SYL (ASSUME NO OTHER COST)

QUESTIONS

- 1) WHAT AMOUNT OF FERTILIZERS (X) MAXIMIZES THE FARM'S PROFIT?
- 2) TO BOOST PRODUCTION, IF GOVERNMENT INTRODUCES A **POLICY** TO OFFER PRICE SUPPORT OF 15%, WILL OUTPUT INCREASE? WHY? WHAT DO YOU THINK CAN CHANGE THE SITUATION?
- 3) HOW MUCH CREDIT SHOULD THE FARMER TAKE IF THE INTEREST RATE IS: A) 0% B)15% C) 30% D) 50% (INSTITUTIONAL SIMULATION)
- 4) IS THE COUNTRY BENEFITTING FROM PRICE SUPPORT POLICY IF: A) NO CREDIT B) WITH CREDIT?
- 5) HOW BIG A CHANGE IN INTERNATIONAL MARKET PRICES CAN THE FARM ABSORB WITHOUT CHANGING PRODUCTION? (ASSUME AND 1:1 CORRELATION BETWEEN WOULD & DOMESTIC PRICE
- 6) SEEING THE HIGH FERTILIZER APPLICATION RATE, GOVERNMENT DECIDES TO IMPOSE A FERTILIZER TA OF: A) 15% B)30% C)100% WITH/WITHOUT CREDIT AND/OR PRICE SUPPORT?
- 7) WHAT IF A WHEAT VARIETY IS INTRODUCED FREELY WHICH INCREASES YIELD BY 20% (START FROM BASE CASE)







