

17. 2. 2004

A Report of the Farm Survey, the Agloclimatological Study and the Agricultural Policy Study

Hiroshi Tsujii

Graduate School of Agriculture, Kyoto University

1. Tsujii has been involved in all the five components of the ICCAP's Economic and Institutional Study. Tsujii, however, focus his efforts to the first and second components. The five components are as follows.

(1) Study of farmers' economy, and farmers' perception of and responses to climatic changes, technological changes and policy and institutional changes. *Tsujii, Asami, Erkan & Graduate Students.*

(2) Agro-climatological Study about the Relations among Crop Production and Climatological Factors. *Tsujii, Yatagai, and Ufuk.*

(3) A regional econometric study of the interactions among climatic changes, agricultural market and policy. *Kagatsume and Tsujii.*

(4) A regional agricultural sector model analysis of the relation among products' structure, water use, agricultural policy, and climatic changes. *Kameyama and Tsujii.*

(5) Institutional economics analyses of use of commons and natural resources such as water and soil by farmers, pastoralists, and the government. *Asami, Umetsu and Tsujii.*

2. The First Component: Farmers' Economy, Perception and Response Study:

2.1 The Objectives

(1) Identification of the characteristics of farmers' economy, and of farmers' perceptions of climatic changes, technological changes and policy changes, and clarification of farmers' responses to these changes in the representative areas of Turkey.
(2) Economic analysis of Agricultural Policy and statistical and economic analysis of Turkish

agriculture and economy. (3) Integration of these analyses in order to identify the effects of climatic change, policy changes, and technological changes to farm and agricultural economy of Turkey. Adana and Konya areas were chosen as our survey sites. Intensive irrigated agriculture is dominant in Adana, while extensive rain-fed agriculture is dominant in Konya.

2.2 Our Farm Survey in the Seyhan Watershed in Adana and Konya in 2002/3

Farm household surveys were conducted in 6 villages in Turkey in Dec. 2002 and Jan. 2003 using a questionnaire that was also used in Nigeria, Tanzania, Indonesia, and Japan. They are two villages in irrigated area and two villages in rain-fed area in Seyhan Basin and two rain-fed villages near Konya. The surveyed villages are

Tasci (Irrigated, IR henceforth) and Kadikoy (Rain-fed, RF henceforth) in the south of Adana City,

Cicekli (RF&IR) and Yeniyala (RF) in the north of Adana City

Okcu (IR) in the south of Konya City

Meydan (RF) in the north of Konya City.

50 farms quasi-randomly selected from each survey village were interviewed.

2.3 Our Farm Survey in the Ceyhan Watershed and Konya in October and November, 2003.

❖ Beloren (RF), Abdioglu (IR), & Akdam (IR) in the south of Adana City

❖ Kilcili (RF) in the north of Adana City.

❖ Beylerce (IR) & Alemdar (IR) near Cumra in the south of Konya

❖ Karakaya (RF), Cesemelisebil (RF), Akorenkipla (RF) & Yagllbayat (RF) in the northeast of Konya.

2.4 Research Publications

Three master theses based on the analysis of the data collected from our farm surveys in 2002/3 and 2003 in Turkey have just been completed in February 2004. Their research topics are credit rationing, crop-livestock integration, and rural female labor emancipation. Four papers by Tsujii and Dr. Chianu, an Nigerian economist, on farmers' perception and strategies for sustainable agriculture in Nigerian savanna have recently been accepted by international academic journals, based on the farm survey data using the questionnaire similar to the one used in Turkey. Tsujii and Ageng published two papers on the same topic for a mountainous village in Java in a book and proceedings of an international workshop based on the farm surveys using the similar questionnaire. Tsujii appeared in the Debate Hour of NHK BS1 TV on "What we can eat in the 21st century?" on January 25, 2004, and asserted that deterioration of natural resources such as soil and water has been very severe in Turkey and other developing countries and trade liberalization cannot solve and even worsens this problem.

I plan to publish a report of our farm surveys in Turkey as a major part of our report of economic subgroup of ICCAP in April 2004.

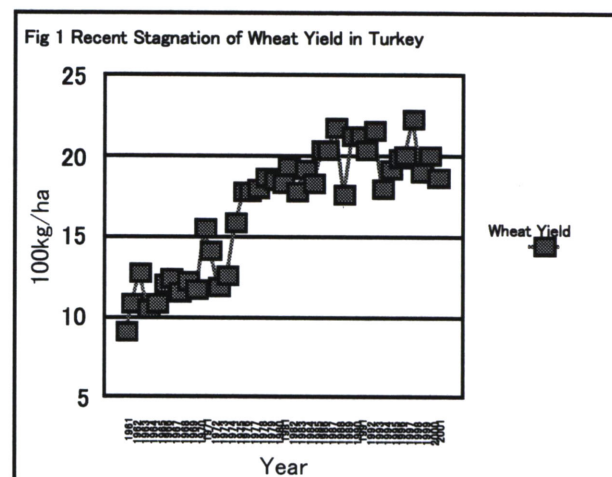
2.5 Important Findings.

2.5.1 General findings and hypotheses

Agriculture in Turkey is very diverse ranging from intensive irrigated agriculture and orchard keeping to very extensive rain-fed agriculture and normadizing.

Konya province has much bigger share (17%) of mera (pasture) in its land use than Adana, but it is still much below the average in Turkey (26%). Konya has much bigger share of agricultural area (64%) than Turkey (35%). In order to get representative information about agriculture and land use in Turkey it is necessary to conduct farm and agricultural survey of north eastern Anatolia, such as

Erzurum, Erzincan, Kars and Sivas, etc.



The yield of wheat, that is the major staple cereal in turkey, has been stagnant during last two and half decades. We hypothesize that this stagnation is caused by soil degradation, decrease in water resources, climatic factors, and economic factors such as wheat price decline and very severe inflation. I would like to test these hypotheses by the analysis for our farm survey data, agloclimatological analysis, and agricultural policy analysis.

2.5.2 Three Master theses

A. Impacts of credit rationing by Kusadokoro.

A major part of farmers' credit provided by a government agricultural credit institution (ACC henceforth). The agricultural credit was determined by the value of each farmer's owned land, and this is credit rationing. Kusadokoro found from his analysis of the farm survey data that credit rationing made farmers with smaller owned land worse off. ACC gave its credit in kind, such as fertilizer, and Kusadokoro found that agricultural productivity of the farmers who face credit rationing was lower, because of the fact that ACC's credit was given in kind. Consequently, credit rationing in rural Turkey worsened farm income distribution and decreased agricultural productivity, *ceteris paribus*.

B. Animal manure market by Maru

Based on the analysis of the farm survey data and village survey in 2002 and 2003, Maru found, first, that animal manure was input much less than what surveyed farmers thought appropriate. This deteriorated soil profile structure that decreased inherent soil fertility. Maru also found that mechanization and a government policy change have decreased number of livestock in the surveyed villages. This decreased the supply of animal manure especially in rain fed area. In irrigated area, commercial crops and orchards have expanded their areas and animal manure demand increased. These were the reasons why inter-regional animal manure market developed. Manure traders emerged and started to market manure from the rain-fed area to the irrigated area in Turkey.

C. Emancipation of female labor by Gulnur

Based on the analysis of female family labor distribution using the data collected using the formal farm survey questionnaire and a female family labor distribution questionnaire, asked to house wives of the surveyed farms, she found that farm family females were relieved or emancipated more from simple hard agricultural labor work by the substitution of such female work with hired labor, as the income of farm households became greater when more intensive and commercial agriculture was usually adopted by them as shown in Table 1.

Table 1. Relationship among Per Capita Household Income, Hired Labor Input, and Wives' Agricultural Labor Input

Data	Kilicli (RF)	Beloren (RF)	Kayisli (IR)	Abdioglu (IR)
Income/capita (million TL)	957	1,084	1,547	2,111
Hired labor input days/HH	288.9	160.4	217.6	2341.8
Agricultural labor input days/wife	182.2	183.8	38.6	18.8

Source: Farm household survey in October-November 2003

She explains this fact by the theory of backward bending labor supply model.

2.5.3 Agricultural production structure

Major crops produced in Adana and Konya are as follows.

	<i>Adana</i>	<i>Konya</i>
<i>Cereals</i>	Wheat Maize	Wheat Barley
<i>Cash crops</i>	Cotton Water melon Vegetables Citrus	Dried beans Sugar beets

3. Agricultural Economic and Agro-climatological Study of the Relation among Wheat Production and Climatic Changes and Its Effects to the Sustainability of Turkish Agriculture (Tsuji, Ufuk, and Yatagai).

A time series agro-climatological and economic analysis among wheat yield and area sown, monthly weather data, and economic and agronomic variables for Adana, Konya, and Turkey was started when Mr. Ufuk came to Japan in 2003. Some quantitative results about heat and cold damages, and positive effects of rainfall in some months were obtained, but more research should be done. There were several past studies on the similar topics by Tsujii for Thai and Japanese Rice.

4. Agricultural Sustainability and Farmers' Perception and Responses

4.1 A quantitative analysis of the relationships among farmers' perceptions of changes in climate and in natural resources, and their impacts to farmers' responses in cropping pattern, water use, chemical fertilizer and manure use, and fallowing, using our farm survey data was started. Six papers on the similar topic using the similar methodology and farm survey questionnaire were already published or accepted for Nigeria and Indonesia by Tsujii with Dr. Chianu and Mr. Ageng. These papers are as follows.

1) CHIANU, Jonas Nwankwo, and TSUJII, Hiroshi,

'Missing Links in Sustainable Food Production in West Africa: the Case of Savanna of Northern Nigeria,' Accepted and in press for Sustainable Development in October 2003.

2) CHIANG, Jonas Nwankwo, TSUJII, Hiroshi, and KORMAWA Patrick, 'Agriculture in the savannas of northern Nigeria: Pressures, transformations, damaging and promising coping strategies.'

3) CHIANG, Jonas Nwankwo and TSUJII, Hiroshi. 'Integrated nutrient management (INM) in the farming systems of the savannas of northern Nigeria: What future?' 2. & 3. are accepted for publication in Outlook on Agriculture and published in June & December 2004.

4) Chianu, J.N. and H. Tsujii. "Determinants of farmers' decision to adopt or not adopt inorganic fertilizer in the savannas of northern Nigeria." Accepted (in November 2003) for publication in Nutrient Cycling in Agroecosystems

5) Hiroshi Tsujii and Ageng S Herianto and Siti Sugiah Machfud Mugniesha, "A Multinomial Logit Analysis of Agroforesters' Perception of Plot-wise Soil Fertility and Soil Mining - Fast Expansion of Leaf Banana in Mountainous Village of West Java -," Sustainable Agriculture and Rural Indonesia, ed by Y. Hayashi, Syafrida Manuwoto, and Slamet Hartono, Gahdja Madha University Press, pp. 295-316, May 2003.

6) Ageng Herianto, Hiroshi Tsujii, Sugiah Mugniesyah, Jonas N Chianu, "An Econometric Analysis of Agricultural Sustainability in a Mountainous Area of West Java - An Application of Linear Probability Model-," Proceedings of the Second Seminar of JSPS-DGHE Core University Program. "Harmonization between Development and Environmental Conservation in Biological Production." the University of Tokyo, pp. 274-288, 2003.

4.2 Soil Fertility and water resources

Some important findings from our farm survey, interviews and observations are as follows.

Inherent soil fertility has been declining in both rain-fed and irrigated areas. It was perceived by farmers that cereals' yield had risen in the long run by about 30% during past 3 decades. Statistical test of this perception is needed.

Leguminous crops are not very much combined with crops. Manure is not applied much to crop fields. This is because of the decline in livestock number. This is caused by the abolishment of livestock subsidy in 1983, overgrazing, and meat price decline (Kondoh).

80% of Yapma or tezek (dried manure): is used as fuel & 20% is used as fertilizer in Alemdar (IR) in Konya. Raw manure application is considered by farmers here to reduce crops yield. Manure application is considered too labor intensive by the surveyed farmers.

Reducing fallow frequency was made possible by application of more chemical fertilizers (Hemi Yasal': chemical habit) in rain-fed area, but it has degraded inherent soil fertility.

Fallow year frequency has decreased in both rain-fed and irrigated areas. In rain-fed area from 1/2 during 1970 to 1990 to 1/3 now (Kondoh). Now 1/2 in wheat area of Cesmesebil (RF) in Konya. In irrigated area in Konya fallow was practiced from 1970 to 1990, but not now (Kondoh).

The fast decline of underground water level was measured and perceived by farmers in the irrigated area of Cumura, Konya.

5. Transformation of Agricultural Policy: SAP (Structural Adjustment Policy)

From Support to Direct Income Support (DIS) from 2000, & full practice in 2003. Decline in crop prices and increase in input prices.