Annex 3.10

Cropping pattern analysis in the Awash Basin

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Ministry of Agriculture and Rural Development

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Cropping pattern analysis in the Awash Basin

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I. BACKGROUND

With a total area of about 112,696 square Kilometer the basin covers 130 woredas in Amhara, Oromia, Afar, Somali, Addis Ababa, and Dire Dawa regional states with altitudes ranging between 210 meters to 4195 meters above sea level.

Bordered by the escarpment of the central highlands in the east and by the northern escarpment of the eastern highlands in the south, the awash basin is constituted mainly by the Afar lowland plains. With the exception of the few narrow strips along the said escarpments, most of the area has altitudes less than 1000 meters. Areas along the escarpments enjoy relatively high rainfall and have lower temperatures. Highland and mid altitude mixed production systems provide livelihood along the escarpments while pastoralist system of production is practiced in the rest of the river basin. With all year round high temperatures, the lowland areas (with the exception of those along river banks) suffer from water shortages.

II. IRRIGATION POTENTIAL

2.1 Existing Large Scale Irrigation Schemes

The Awash Basin takes the lead in terms of irrigation development and utilization of run-off for agricultural production. Irrigation development is dominated by large-scale schemes established mainly for the production of Cotton, Sugarcane and horticultural crops. Some of the schemes have been transferred to private investors while some are still run as parastatal enterprises. Traditional and modern small scale irrigation schemes are scattered and not well developed. The basin has an estimated irrigation potential of about 134,121 ha out of which 30,556 ha are for small-scale, 24,500 for medium scale and 79,065 for large scale (Awlachew et.al, IWMI)

Table 1: Profile of Irrigation Schemes

Scheme	Irrigation Potential (ha)	Designed for Irrigation (ha)	Actually Irrigated (ha)
Upper Awash		7,187	5,892
Middle Awash		14,600	6,569
Lower Awash		18,000	Mostly abandoned
Wonji Shoa Sugar estate	6,162.8	5,905	5,905 estate 1,152 out grower
Metehara and Abadir Sugar Estates	14,733	10,358	10,300
TOTAL		56,358	29,818

Ref: Awash Basin flood control and watershed management study, 2006; IWMI working paper 124
Note: Only large scale schemes on which data is available are included

- **Amibara Irrigation Complex (Middle Awash)**: With a total area of about 14,000 ha, farms under this complex produce mainly cotton. Limited amounts of Maize Banana and

Sweet potatoes are also produced. The complex is located in the middle valley and comprises of: Awara Melka , Melka Sedi, Melka Werer state farms, and Angelele , Asobabien , Dofan and Bolhamo farms

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- **Upper Awash**:_Upper Awash consists of Tibila, Merti and Nura Era farms which produce mainly fruits and vegetable crops. Designed area is about 7,187 ha while actual irrigated area is about 5,892 ha. Tibila and Degaga farms have total areas of 650ha and 180ha respectively while Merti jeju and Nura era have 4,215ha and 6,046ha respectively
- **Middle Awash**: Dupti and Tendaho farms are included under this scheme which originally had a total area of about 14,600 ha most of which is abandoned due to high water table and salinity problems and leased to private farmers Production is mainly focused on cotton production while some fruits pasture and cereals are also produced
- **Lower Awash:** Developed in the mid 60's now mostly abandoned due to high water tables, salinity and sedimentation problems
- **Wonji Shoa Sugar Estate**: The sugar estate and out-grower scheme under this farm have total areas of about 5,905 ha and 1,105 ha respectively the sugar estate has a total concession area of about 6,162.8 ha
- **Metehara and Abadir estates:** This sugar estate has total concession area of about 14,733 ha area and is composed of the Metehara and Abadir estates. A total of about 10,300 ha is currently covered with sugar cane
- **Awash Melkasa smallholder irrigation schemes (Upper Awash):** Melka oda, Qobo Malmele, Batu Degaga, Doni, Sara, Weba, Sogido lugo are included under this scheme and all of them are engaged in the production of horticultural crops (mainly tomatoes and onions)

Significant areas of the state-run farms have been transferred to private and community ownership

2.2 *Transferred Irrigation Schemes*

Portions of irrigation schemes are being transferred in to private and communal ownership some of which are shown in the table below:

No.	Farm/Scheme	Area (ha)	Community	Current operation
1.	Amibara Settlement	2,014	Afar Clans	Private (Amibara Agr.Dvt.PLC)
2.	Melka Sadi (SF) (Unit 3) 625	3625	Afar Clans	Private (Africa Ag. Dev. Plc)
3.	Amibara Angelele (SF)	3,269	Afar Clans	Private
4.	Doffan Bolhamo (SF)	1,390	Afar Clans	Mostly abandoned
5.	Gewane (SF)	2,000	Afar Clans	Mostly abandoned
6.	Gewane (RRC)	1,200	Afar Clans	Mostly abandoned
7.	Dubti (SF)	3,800	Afar Clans	Very small; area leased
8.	Sembeleta (SF)	2,502	Afar Clans	Partly leased
9.	Assita (SF)	2,651	Afar Clans	Partly leased
10.	Tangayekuma (SF)	4,000	Afar Clans	Leased to private
11.	Mille (SF)	946	Afar Clans	Some used by communities

Ref; Irrigation potential in Ethiopia, FDRE, Ministry of water resources, September 2005

Note: Dofan, Amibara settlement, Melka Sedi, Amibara Angelel were parts of the Amibara complex (Middle Awash) while Dupti, Sembeleta Asita, Tangayekuma and Mille were under lower Awash. Gewane was part of the middle Awash**.**

III. DETERMINATION OF CROPPING PATTERN

Selection of crops and development of cropping patterns are based mainly on the study of existing production practices and crop suitability analysis. The following major considerations are made in describing existing patterns as well as possible viable patterns. Crops and cropping patterns which do not necessarily reflect existing practices are included to show possibilities and potentials under a situation of water availability.

1. *Factors other than climatic will be favorable or could be modified with relative ease*
2. *climatic conditions and length of growing season requirements*
3. *considerations of water utilization efficiency and yield response*
4. *Past and current irrigation practices*

Cropping patterns are shown on an annual calendar using the monthly average crop coefficients (kc). Crop coefficients (Kcs) used in similar agro ecologies elsewhere in the country as well as existing irrigation schemes in the Awash Basin are used. Cropping patterns along the eastern and western escarpments are developed following the rainfall patterns. As rainfall decreases to negligible levels for crop production as one goes towards the east, patterns are determined on the crop establishment, development and maturity length of crops and cropping mixes.

3.1 General Crop Requirements

The Awash basin is suitable for the production of a wide range of food as well as commercial crops most limiting factors being soil moisture and temperature. General requirements of crops that are and could be considered for the basin are summarized hereunder: Tobaccos, soybeans and pepper, are among crops that deserve increased consideration in the basin.

Maize: Maize can be grown under wide range of climatic conditions with mean daily temperatures above 15°c and free of frost hazards. Length of growing period greatly varies with variety. Maize is either day-length neutral or short-day in respect to day length requirement. It grows in wide range of well drained and aerated soils with deep water tables and free of water logging. Very heavy dense clay and very sandy soils are not favorable for the crop. Optimum PH range for its production is between 5 and 7.

Sorghum: Sorghum is known for its drought resistance and is grown extensively under rain fed conditions. Certain sorghum varieties respond reasonably well to supplementary irrigation while others, particularly the drought resistant ones don't. Optimum temperature for high yielding varieties is over 25 degrees while some are adapted to temperatures lower than that. Early types require 90-110 days while medium varieties need 110-140 days to mature. Sorghum performs well on many soil types while light to medium textured soils are most appropriate for its production. The crop is moderately tolerant to soil salinity.

Sugarcane: Long warm growing season with high incidence of radiation and adequate moisture are favorable for the crop which should be followed by dry, sunny and fairly cool (frost free) ripening and harvesting period. Long growing season (15-16 months) is essential for high yield. First crops are normally followed by 2-4 ratoon (regenerating after harvest) crop. Sugarcane does not have special soil requirements; however, best suited soils are deep, well drained and aerated with a total available water content of about 15 percent or more. Ground water table should be more than 1.5-2 meters below the surface, Optimum PH. is abut 6.5 with range between 5-8.5. Sugarcane has high nitrogen and potassium requirements and is sensitive to salinity.

Tobacco: Grows under wide range of climates but requires frost-free period of at least 90-120 days from transplanting to harvest. Dry period for ripening is a requirement. Soil requirements vary with varieties. Tobacco is sensitive to water-logging and demands well drained aerated soils while its PH requirement ranges 5-6.5.

Cotton: Crop development is sensitive to temperature since cotton is very sensitive to frost. A minimum of about 200 consecutive frost free days are required. For proper formation of buds and flower development, daytime temperatures above 20 degrees and nighttime temperatures of above 12 degrees are required but should not exceed 40 and 27 degrees respectively.. The crop grows on wide range of soils while medium-heavy textured deep soils with good water holding capacities are best suited. PH requirement ranges 5.5-8 and the crop is tolerant to soil salinity.

Wheat: The crop is grown in mid (1500 meters) and high altitudes. Mean daily temperature requirement for optimum production is between 15 and 20°C Medium textured soil with PH

range of 6-8 is favorable while it also grows on wide range of soil conditions. The crop is relatively tolerant to high water table.

Soybeans: Soybean is mainly grown under rain-fed conditions. However, production under irrigation and supplementary irrigation is also possible. Warm conditions are favorable for soybeans production while it tolerates very high and low temperatures. Minimum temperature for crop production is 15°C. It is a short- day crop and length of its growing period varies between 100 and 130 days. It grows on a wide range of well drained soils with PH ranges of 6-6.5 except on those that are very sandy.

Tomatoes: Optimums mean daily temperature for the production of tomatoes range between 18 and 25°c with night temperatures of 10 to 20°c. The crop is highly sensitive to frost and is day-length neutral. Length of growing periods varies between 90 and 150 days depending on variety and growing conditions. Light loam soils with PH range of 5-7 that are well drained and are free of water logging are suitable for its production.

Cabbage: Cabbage requires cool & humid climatic conditions and growing period length of 130 to 140 days depending on variety. Most varieties tolerate short periods of frost up to -10oc. Heavier well drained loam soils with PH ranges of 6-6.5 are suitable for its production while sandy to sandy loam soils are preferred under high moisture conditions for optimum drainage. Seedlings could be raised in open seed beds or tubes to protect against low temperatures.

Onion: Onion grows under a wide range of climatic conditions. Optimums mean daily temperatures vary between 15 and 20°c. Bulb production is controlled by day length. Critical day-length varies between 11 and 16 hours depending on the varieties. Long- day varieties, if grown under short day conditions will not be able to produce bulbs. Length of growing period varies between 13 and 175 days. Onion is usually sown in nursery beds and then transplanted in to the field after 30-35 days. Medium textured soil with PH range of 6-7 is highly favorable while it also grows on a wider range of soil types

Potato: Yield of potato is highly affected by temperatures. The optimum mean daily temperature range for its production is 18-20°C. A night-time temperature of less than 15°C is required to initiate tuber formation. Low temperatures at planting slow down emergence and lead to increased growing period length. Potato varieties widely differ in their growing period length (90-150 days). Late varieties produce good yield under both long and short day conditions. Short day varieties are suitable for tropical conditions. Well drained aerated and porous soils with PH of 5-6 are required for potato production.

3.2 Cropping Patterns of Major Irrigated Crops

Large-scale government managed irrigation schemes in the river basin produce mainly sugarcane, cotton, tobacco and fruits which include: oranges, mandarin, tomato, guava and grapevine, while community managed small scale farms produce potato, pepper, onion, tomatoes and banana as well as maize and cotton. Shifts in cropping patterns happen due to several factors among which are crop pest and disease infestation, market situation and price changes as well as

management decisions. In the cool humid and cool sub moist agro-ecologies many schemes produce horticultural crops during dry season and cereals and pulses during the wet seasons. In the warm arid lowlands, mainly availability of water determines the pattern and intensity of production.

Existing cropping practices and cropping mix include mostly industrial fiber crops mainly cotton and Sugar cane, while there are also schemes producing fruits and other horticultural crops.

Table 3: Crops in Large Scale Irrigation Schemes and Small Scale Out growers

	Irrigation Scheme	Major crops	Minor crops	Area (ha)
1	Middle Awash	Cotton	Banana, pasture, maize	14,600 (designed) 6,569 (actual)
2	Wonji Shoa	Sugarcane	Haricot bean, Crotaria	7,279.8
3	Metehara	Sugarcane		11,058
4	Wedecha Belbela	Shallot, Onion, Tomatoes	Sugarcane, Chickpea, Lentils	1,600 (designed) 1300 (actual)
5	Upper Awash Agro-Industry	Oranges, Mandarins, Tomatoes, Guava, Grapevine, Okra, Onion, Green chilies, Cabbage, Carrots, Beetroots	Cotton, Tobacco, Maize, Popcorn, Beans	7,187 (designed) 5,892 (actual)
7	Golgota Irrigation Scheme (community/small scale) upper awash	Onion, Tomatoes, Maize, Sugarcane, Banana, Papaya, Cabbage		850
	Upper basin(small-scale)	Onion, Tomato	Cabbage carrot	
	Mid basin (small scale)	Potatoes, Maize, Onion, Pepper	Tomatoes, Carrot Cabbages	
	Lower basin (small scale)	Maize, Sorghum	Onion, Carrot, Tomatoes	

3.3 Agro-Ecological Classification

The Ministry of Agriculture and Rural Development (MoARD) has recently re-categorized the country from 18 in to 32 major agro ecological zones (Annex 1). The Awash Basin is classified into 17 agro-ecological zones which range from cool humid to sub-afro-Alpine to hot arid lowlands:

1. Cold humid sub afro alpine (H5)

2. Cool humid mid highlands (H4)
3. Cool moist mid highlands (M4)
4. Cool sub-humid mid-highlands (SH4)
5. Cool sub-moist mid-highlands (SM4)
6. Hot arid lowlands (A1)
7. Tepid arid mid-highlands (A3)
8. Tepid humid mid-highlands (H3)
9. Tepid moist mid-highlands (M3)
10. Tepid semi-arid lowlands (SA3)
11. Tepid sub-humid mid-highlands (SH3)
12. Tepid sub-moist mid-highlands (SM3)
13. Warm arid lowland plains (A2)
14. Warm moist lowlands (M2)
15. Warm semi-arid lowlands (SA2)
16. Warm sub-humid lowlands SH2)
17. Warm sub-moist lowlands (SM2)

These agro-ecologies are regrouped in to 8 agro-ecological categories based on general similarities in cropping patterns of irrigated crops for the purpose of estimating irrigation water requirements.

The major agro-ecological determinant is altitude the variation of which greatly determines temperature and precipitation the combination of which in turn determines agro-ecologies.

Table 4: Major Agro-Ecology Categories

	Agro ecology	**Altitude (m) (range)**	**Mean Annual temperature (^{O}C)**	**Mean Annual rainfall (mm) range**	**Growing Periods (GP) days**
1	Afro-alpine	3000-4000	7.5-10	700-2000	241-300
2	Cool moist/humid	1000-3200	11-15	700-2200	121-240
3	Cool sub humid	1400-3200	11-15	-1200	61-240
4	Tepid	1000-2800	16-21		121-300
5	Warm sub humid	400-1500	21-27	400-	61-240
6	Warm semi Arid	400-2000	16-27	300-	-240
7	Arid	0-1400	21-27.5	100-600	<45
8	*Hot Arid*	-126-500	>27	100-400	<45

V. Cropping patterns

Most of the large-scale irrigation enterprises have as their major crops (60-80 percent of their area) cotton, sugarcane or citrus fruits) with only minor share of other crops including onions potatoes and tomatoes. Cotton is the sole crop grown in Middle Awash in irrigation project. Small scale farms in the warm moist and semi arid lowlands are engaged mainly in the production of Maize and some vegetables. However information on small scale irrigation practices, not only for this basin but for the country as a whole is very poor. This should be supported by an intensive field assessment. Moreover, as indicated above cropping pattern at woreda are lacking for irrigated crops. This posed difficulties to develop cropping patters of irrigated crops by the eight major agro-ecology zones reclassified in this study.

However, it was tried to develop cropping patterns by the eight major agroecology zones based on the results of the baseline survey carried out by this project as shown in Tables 6-12. The tables do not provide or represent basin-wide cropping patterns as the baseline survey covered about 450 small scale irrigation schemes in about 10% of the basin area although the included large irrigation systems mean a lot. Therefore, one has to carefully consider these cropping patterns.

Table 5: Existing Rainfed Cropping Patterns - Cool moist/humid-cool Sub-humid

Crops	Area	May	Jun	Jul	Aug	Sept	Oct	Nov.	Dec	Jan	Feb	Mar	Apr
Teff													
Wheat(Global)													
Maize													
Barley													
Faba beans													
Peas													
Chickpeas													
Vetch													
Wheat(Local)													
Lentils													

Tables 6- 12 provide cropping patterns of Irrigated Crops by Major Agroecology based on the Results of baseline survey. The figures of the cropping pattern are area percentages.

Table 6: Cropping pattern of Irrigated Crops for Hot Arid Agro-ecology Zone

Crop Type	Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Banana	8.9	49.61	49.61	49.61	49.61	49.61	49.61	49.61	49.61	49.61	49.61	49.61	49.61
Cabbage	0.1	0.61	0.61	0.61	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.7	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72
Coffee	0.7	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88
Onion	1.8	6.44	6.44	6.44	6.44	6.44	0.00	3.50	3.50	3.50	3.50	3.50	3.50
Pepper	1.3	5.60	5.60	5.60	5.60	0.00	0.00	1.72	1.72	1.72	1.72	1.72	0.72
Sorghum	0.7	0.00	0.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.11	0.00
Sugar cane	2.0	10.82	10.82	10.82	10.82	10.82	10.82	10.82	10.82	10.82	10.82	10.82	10.82
Teff	1.0	0.00	0.00	0.00	0.00	0.00	0.00	5.55	5.55	5.55	5.55	0.00	0.00
Tomato	0.8	3.50	3.50	3.50	3.50	3.50	0.00	1.05	1.05	1.05	1.05	1.05	0.00
Total Irrigated area	18	84.2	84.2	84.2	88.2	82.0	72.0	83.9	83.9	83.9	83.9	76.4	72.3
Equipped area:	22												
Irrigation intensity (%)	84												

Table 7: Cropping pattern of Irrigated Crops for Arid Agro-ecology Zone

Crop Type	Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Citrus	1.3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Coffee	0.8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cotton	10,322.0	0.00	0.00	0.00	38.92	97.27	97.27	97.27	97.27	97.27	97.27	58.35	0.00
Maize	70.1	0.02	0.33	0.33	0.33	0.35	0.04	0.02	0.02	0.33	0.33	0.33	0.31
Onion	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pepper	1.1	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sesame	0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sorghum	2.0	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.00
Teff	2.4	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.00
Tomato	1.5	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Irrigated area	10,402	0.1	0.4	0.4	39.3	97.7	97.4	97.4	97.4	97.7	97.7	58.8	0.3
Equipped area: Irrigation intensity (%)	10,611 98												

Table 8: Cropping pattern of Irrigated Crops for Warm Semi -Arid Agro-ecology Zone

Crop Type	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Banana	24.7	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.83	2.83	2.83
Barley	58.0	3.24	3.24	3.24	3.24	3.24	3.44	3.41	3.41	3.41	3.04	1.03	0.00
Beans	14.0	0.00	0.00	0.00	0.00	0.00	1.38	1.38	1.38	1.38	1.61	0.23	0.23
Beet roots	0.3	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Cabbage	7.9	0.14	0.14	0.26	0.11	0.11	0.43	0.32	0.55	0.55	0.33	0.33	0.10
Carrot	0.1	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chickpeas	2.5	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29	0.29	0.29	0.00	0.00
Citrus	17.2	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97	1.97
Coffee	17.1	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.87
Flowers	1.0	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Garlic	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.23	0.23	0.00
Lentils	1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.20
Maize	158.3	1.61	4.30	4.82	5.77	7.12	5.51	9.59	8.96	8.87	11.28	9.78	8.06
Niger seed	10.0	0.00	0.00	0.00	1.15	1.15	1.15	0.00	0.00	0.00	0.00	0.00	0.00
Onion	239.6	9.34	9.34	11.12	10.61	4.70	3.75	2.52	7.40	7.97	15.23	14.15	8.80
Papaya	2.3	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Pepper	81.3	2.67	2.67	3.90	3.76	2.41	3.57	2.37	1.97	1.97	3.22	3.19	3.15
Potato	14.9	0.26	0.27	0.24	0.09	0.09	0.31	0.30	0.36	0.36	1.43	1.13	1.08
Rice	2.3	0.00	0.00	0.00	0.00	0.00	0.06	0.26	0.26	0.26	0.26	0.00	0.00
Sorghum	207.2	0.11	0.11	0.11	1.38	6.02	7.59	21.02	21.02	21.02	23.66	19.53	16.09
Sugar cane	9.3	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Sweet	4.5	0.52	0.52	0.52	0.52	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Teff	276.3	3.67	3.70	11.93	11.81	9.75	8.60	15.88	15.53	15.53	18.51	9.67	3.90
Tomato	14.6	1.15	1.18	1.49	1.11	1.08	0.29	0.03	0.14	0.14	0.19	0.16	0.04
Wheat	102.9	4.93	4.93	5.19	5.77	4.85	6.15	6.52	5.95	5.72	5.29	3.18	0.11
Total Irrigated area	1,270	35.70	38.46	50.87	53.37	49.07	50.55	71.91	75.47	75.72	92.98	71.04	49.89
Equipped area	872												
Irrigation intensity (%)	146												

Table 9: Cropping pattern of Irrigated Crops for Warm Sub humid Agro-ecology Zone

Crop Type	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avocado	0.8	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Banana	19.3	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Barley	1.0	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.00
Beans	0.8	0.04	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Beet roots	0.3	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Cabbage	8.8	0.35	0.35	0.35	0.31	0.27	0.25	0.00	0.00	0.05	0.05	0.07	0.07
Carrot	0.4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Citrus	25.0	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Coffee	13.0	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Garlic	1.3	0.06	0.06	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kale	95.0	0.00	0.00	0.00	0.00	0.00	0.00	4.51	4.51	4.51	4.51	4.51	0.00
Maize	267.6	1.12	3.00	3.73	3.68	3.64	2.44	5.32	5.22	5.27	8.97	8.65	7.74
Mango	21.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Niger seed	41.6	0.00	0.00	1.04	1.93	1.98	1.98	0.05	0.05	0.05	0.05	0.05	0.00
Onion	1,243.7	32.70	34.38	34.52	34.19	19.80	16.05	7.36	14.82	18.14	23.99	18.74	9.83
Papaya	1.3	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Pea	5.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.24
Pepper	83.8	1.09	1.47	2.02	2.12	1.93	0.90	0.92	1.18	1.23	1.84	1.03	0.74
Potato	7.5	0.12	0.19	0.19	0.21	0.12	0.06	0.16	0.14	0.14	0.15	0.15	0.00
Sesame	1.5	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Sorghum	503.5	0.00	0.00	0.00	0.01	1.19	7.81	21.29	21.29	22.62	23.91	20.92	15.72
Sugar cane	36.7	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
Sweet	5.4	0.19	0.25	0.25	0.25	0.19	0.12	0.07	0.00	0.00	0.00	0.00	0.00
Teff	689.9	5.17	7.32	11.17	12.93	12.88	9.10	14.58	14.58	15.01	18.78	10.16	6.25
Tomato	101.4	3.04	3.04	3.09	2.85	2.71	2.50	1.32	1.32	1.65	1.65	0.77	0.41
Wheat	10.8	0.00	0.24	0.24	0.24	0.24	0.02	0.26	0.27	0.27	0.27	0.04	0.01
Total Irrigated area	3,186	49.45	55.91	62.28	64.38	50.55	46.95	61.54	69.07	74.63	90.09	71.01	46.64
Equipped Area	2,106												
Irrigation intensity (%)	151.3												

Table 10: Cropping pattern of Irrigated Crops for Cool Sub Humid Agro-ecology Zone

Crop Type	Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Banana	0.9	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Barley	249.0	25.22	25.22	25.22	25.22	26.80	6.42	2.81	2.81	2.81	3.21	3.96	2.96
Beans	33.3	0.27	0.27	0.27	0.27	0.89	4.14	3.87	3.87	3.87	3.25	2.32	1.70
Beet roots	21.2	0.30	0.33	0.30	0.67	0.98	0.92	0.97	0.93	0.93	1.46	1.43	1.24
Cabbage	55.8	0.34	0.52	0.52	0.73	3.28	3.07	2.75	2.75	3.00	2.85	3.66	3.62
Carrot	15.9	0.28	0.28	0.28	0.59	0.59	0.70	0.48	0.48	0.67	1.26	1.32	1.21
Chickpeas	8.5	0.00	0.00	0.00	0.00	0.62	0.62	0.72	1.06	1.06	0.44	0.34	0.34
Citrus	1.5	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Coffee	10.3	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Garlic	20.6	2.47	2.47	2.47	2.47	2.38	0.09	0.09	0.09	0.09	0.09	0.00	0.00
Lentils	17.3	0.00	0.00	0.00	0.00	1.09	1.43	2.15	2.15	2.15	1.15	0.62	0.53
Maize	27.1	0.64	1.51	1.51	1.82	1.66	0.87	1.24	1.12	1.12	1.28	1.15	0.62
Niger seed	3.0	0.00	0.00	0.00	0.37	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Onion	247.6	6.58	6.98	8.16	9.28	12.12	11.46	11.40	11.03	12.83	11.86	13.04	10.75
Pea	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19	0.19
Pepper	124.8	0.43	0.47	0.49	0.85	7.03	7.06	7.23	7.17	6.42	7.23	8.20	7.81
Potato	77.2	1.20	1.33	1.33	1.06	4.76	4.98	5.19	5.01	5.32	2.90	3.49	3.49
Sorghum	34.9	0.00	0.00	0.09	0.90	1.03	1.07	3.47	4.24	4.24	3.43	3.31	0.87
Sugar cane	4.3	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Sweet	1.1	0.00	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.12	0.12	0.12
Teff	88.7	0.84	1.30	4.76	4.57	3.98	3.98	3.95	5.66	6.28	6.22	5.85	2.79
Tomato	12.9	0.67	0.67	0.70	0.82	0.82	0.61	0.28	0.03	0.03	0.34	0.65	0.62
Wheat	98.6	2.77	2.89	2.89	3.02	5.01	6.33	5.71	5.96	5.96	5.83	6.36	4.79
Total Irrigated area	1,156	44.1	46.4	51.1	54.8	75.5	56.2	54.4	56.5	58.9	55.2	58.1	45.8
Equipped area:	804												
Irrigation intensity (%)	144												

Table 11: Cropping pattern of Irrigated Crops for Cool Moist/ Humid Agro-ecology Zone

Crop type	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Banana	5.0	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Barley	216.4	15.46	15.46	15.46	15.23	15.52	11.13	2.40	2.40	3.23	4.52	4.29	2.47
Beans	97.5	0.34	0.34	0.34	0.34	1.14	4.67	8.66	8.66	8.66	8.66	7.55	1.03
Beet roots	3.2	0.10	0.10	0.10	0.10	0.10	0.07	0.04	0.02	0.15	0.20	0.20	0.19
Cabbage	20.4	0.78	0.88	0.99	0.96	0.63	0.38	0.17	0.17	0.24	0.46	0.79	0.75
Carrot	7.5	0.33	0.35	0.35	0.35	0.32	0.22	0.10	0.10	0.10	0.34	0.34	0.23
Chickpeas	6.8	0.25	0.25	0.25	0.05	0.05	0.05	0.00	0.00	0.37	0.37	0.37	0.00
Citrus	10.6	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Coffee	27.1	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Garlic	36.7	3.01	3.01	3.01	3.01	0.32	0.14	0.06	0.06	0.06	0.38	0.38	0.32
Kale	0.6	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.05	0.05	0.05
Lentils	12.5	1.15	1.15	1.15	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lettuce	0.3	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maize	233.8	14.79	14.97	14.97	16.06	13.75	10.31	4.43	4.33	6.04	5.76	4.17	3.02
Mango	2.3	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Niger seed	1.5	0.00	0.00	0.00	0.00	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Onion	206.1	7.07	7.58	8.60	9.27	5.44	4.99	3.61	4.19	5.86	7.70	6.89	5.04
Pea	4.8	0.00	0.05	0.05	0.05	0.15	0.26	0.40	0.40	0.40	0.40	0.29	0.02
Pepper	70.0	1.80	2.04	2.11	1.83	1.49	1.50	2.39	3.15	3.75	3.20	2.61	1.32
Potato	37.1	1.28	1.28	1.28	1.23	0.94	0.88	0.74	0.69	1.47	1.94	1.81	1.44
Rice	1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.09
Sorghum	31.7	0.00	0.00	0.00	1.09	1.77	2.56	2.93	2.93	2.93	2.93	2.59	1.76
Sugar cane	6.5	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Sweet	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Teff	178.3	2.13	2.47	2.24	2.43	1.85	4.70	11.27	11.87	8.43	5.68	5.08	1.94
Tomato	22.2	1.06	1.19	1.19	1.19	0.80	0.12	0.09	0.16	0.16	0.39	0.85	0.72
Wheat	111.8	5.55	5.55	5.55	5.92	5.96	6.22	3.32	3.37	3.37	4.41	4.41	3.39
Total Irrigated area	1,352	59.9	61.5	62.4	65.0	55.2	53.1	45.5	47.4	50.1	52.4	47.6	28.7
Equipped area:	1,083												
Irrigation intensity (%)	125												

Table 12: Cropping pattern of Irrigated Crops for Tepid Agro-ecology Zone

Crop Type	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Banana	559.3	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77
Barley	481.1	0.62	1.24	1.28	1.29	1.15	1.15	0.76	0.26	0.26	0.26	0.24
Beans	26.5	0.01	0.01	0.01	0.00	0.00	0.06	0.07	0.07	0.07	0.08	0.05
Beet roots	166.6	0.20	0.21	0.28	0.22	0.17	0.07	0.04	0.06	0.13	0.23	0.22
Cabbage	546.0	0.96	1.08	1.40	1.09	0.44	0.38	0.07	0.10	0.21	0.26	0.25
Carrot	505.5	0.70	0.72	0.73	0.25	0.02	0.01	0.01	0.02	0.85	0.86	0.85
Chickpeas	228.2	0.59	0.65	0.65	0.46	0.29	0.01	0.04	0.04	0.05	0.07	0.04
Citrus	2,176.2	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87
Coffee	64.1	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Cotton	16.0	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flowers	4.0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Garlic	206.8	0.48	0.50	0.49	0.48	0.03	0.01	0.00	0.00	0.04	0.14	0.14
Groundnuts	1.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kale	110.8	0.07	0.07	0.08	0.12	0.12	0.12	0.00	0.05	0.18	0.23	0.23
Leguminous	8.0	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Lentils	349.3	0.86	0.99	0.99	0.86	0.13	0.03	0.06	0.05	0.05	0.11	0.08
Lettuce	11.5	0.04	0.04	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maize	903.4	1.05	1.30	1.55	1.17	1.26	1.72	1.05	0.98	1.18	1.20	0.76
Mango	1,541.0	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87
Mendarin	230.0	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Millet	10.3	0.03	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Niger seed	60.6	0.01	0.01	0.01	0.00	0.00	0.00	0.02	0.02	0.03	0.17	0.17
Onion	3,602.6	5.27	6.05	7.61	6.59	2.55	2.41	1.41	2.11	3.39	3.50	2.53
Other root	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	9.5	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Papaya	10.1	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Pea	29.5	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05
Pepper	520.9	0.48	0.54	0.62	0.47	0.30	0.33	0.65	0.71	0.77	0.87	0.71
Potato	1,605.8	3.24	3.71	3.89	3.82	0.66	0.19	0.11	0.28	0.64	1.11	1.12
Sorghum	350.5	0.00	0.00	0.03	0.15	0.16	0.21	1.09	1.09	1.11	1.11	1.02
Sugar cane	17,043.0	53.82	53.82	53.82	53.82	53.82	53.82	53.82	53.82	53.82	53.82	53.82
Sweet	99.8	0.03	0.03	0.07	0.07	0.05	0.06	0.21	0.22	0.24	0.05	0.04

Swiss Chard	2.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Teff	1,048.9	0.66	0.71	1.56	1.07	1.04	0.70	1.42	1.44	1.41	1.14	0.57
Tomato	1,186.2	1.07	1.10	2.97	2.72	2.02	1.97	0.18	0.34	0.64	0.68	0.63
Wheat	73.6	0.05	0.05	0.07	0.06	0.06	0.14	0.16	0.16	0.16	0.16	0.07
Total Irrigated area	33,789	84.8	87.5	92.8	89.4	78.8	77.9	75.7	76.4	79.8	80.6	78.1
Equipped area:	31,665											
Irrigation intensity (%)	107											

Annex 1: ***Woredas in Awash Basin***

NO.	W Name	W. Name_(new)	Shape Length	Shape Area(m^2)
1	Habro	Habro	53356.27	71711950.88
2	Kuni	Kuni	12368.64	3224635.85
3	Goba Koricha	Goba Koricha	142928.9	686860746
4	Chiro	Chiro	6085.47	1525515.581
5	Chiro	Chiro	118698.4	622542430.9
6	Tulo	Tulo	44988.57	15331811.57
7	Deder	Deder	43762.41	34606404.41
8	Mieso	Mieso	290889.5	2637919796
9	Doba	Doba	122729.6	629130407
10	Kersa	Kersa	62928.1	84145868.1
11	Goro Gutu	Goro Gutu	89458.66	401970282.5
12	Haro Maya	Haro Maya	50000.85	65950882.33
13	Meta	Meta	73049.22	233877398.6
14	Kombolcha	Kombolcha	86633.59	234651772.4
15	Jarso	Jarso	91970.41	318178563.4
16	Jijiga	Jijiga	167976.3	697772100.7
17	Gurgura	Gurgura	186418.5	1054921596
18	Guangua	Guangua	318614.6	3915539542
19	Miesso	Miesso	253301.1	3095865453
20	Dembel	Dembel	243516.2	2723228661
21	Awbere	Awbere	222668.3	2713352583
22	Bure Mudaytu	Bure Mudaytu	171685.1	1103549253
23	Shinile	Shinile	404357.1	8662100998
24	Afdem	Afdem	409644	4404985735
25	Erer	Erer	442833.1	4080876779
26	Ayisha	Ayisha	475441.9	7432569968
27	Afambo	Afambo	182487.2	1873961324
28	Mile	Mile	373822.7	4766173396
29	Ambasel	Ambasel	126020.4	204170553.1
30	Aysaita	Aysaita	189920.9	1233501622

NO.	W Name	W. Name_(new)	Shape Length	Shape Area(m^2)
31	Habru	Habru	169116.2	1220292647
32	Chifra	Chifra	251544.1	3290656958
33	Guba Lafto	Guba Lafto	72384.95	105930661.6
34	Ewa	Ewa	135025.4	809309135.8
35	Aura	Aura	164136.3	502978133.3
36	Dubti	Dubti	377216.5	3831457441
37	Elidar	Elidar	104657.9	313711327.2
38	Tena	Tena	11521.95	4647825.108
39	Hitosa	Lode Hitosa	97894.7	505814599.5
40	Hitosa	Hitosa	123297.2	470838719.1
41	Sude	Sude	20190.92	16256754.18
42	Ziway Gugda	Ziway Gugda	63256.3	189142783.1
43	Chole	Chole	42697.79	75562941.81
44	Sodo	Sodo	80005.3	116092221.3
45	Dodotana Sire	Dodotana Sire	213731.8	1080028195
46	Jeju	Jeju	128749.4	711269919.5
47	Dugda Bora	Dugda Bora	130165.8	741186635.9
48	Kokir	Kokir	69381.12	159027535.3
49	Ada'a Chukala	Liben Chukala	111925.6	714478610.2
50	Aseko	Aseko	108363.5	461981756.2
51	Kersana Kondaltiti	Kersana Kondaltiti	181593.1	1024202684
52	Walisona Goro	Walisona Goro	59972.37	100972029.6
53	Adama	Adama	167768.2	1038051603
54	Becho	Becho	92076.31	400931913.9
55	Tole	Tole	105586.1	417512153.1
56	Wenchi	Wenchi	15656.1	4969623.379
57	Lome	Lome	140216.1	743585599.8
58	Boset	Boset	201629.5	1479962564
59	Merti	Merti	186623.3	1270965396
60	Dawo	Dawo	103149.5	327390369.1
61	Ada'a Chukala	Ada'a	133879.7	870342096.3

NO.	W Name	W. Name_(new)	Shape Length	Shape Area(m^2)
62	WEREDA 27	WEREDA 27	27661.66	34868883.49
63	Ilu	Ilu	82864.99	364118131.7
64	WEREDA 26	WEREDA 26	49030.15	85810255.82
65	Anchar	Anchar	122331	769708745.4
66	WEREDA 19	WEREDA 19	42409.37	45712741.88
67	Akaki	Akaki	146496.7	681284090.1
68	WEREDA 20	WEREDA 20	13362.36	7281232.149
69	WEREDA 23	WEREDA 23	22220.16	16230241.09
70	WEREDA 22	WEREDA 22	7973.863	3699349.356
71	WEREDA 18	WEREDA 18	9513.116	4083148.112
72	WEREDA 21	WEREDA 21	7703.95	3835698.211
73	Alem Gena	Alem Gena	140861.1	900223513.7
74	WEREDA 04	WEREDA 04	5741.597	2165420.358
75	WEREDA 17	WEREDA 17	56129.1	78115783.2
76	WEREDA 15	WEREDA 15	9717.171	3683402.524
77	WEREDA 03	WEREDA 03	6711.919	2282739.895
78	WEREDA 06	WEREDA 06	6068.859	1824115.652
79	WEREDA 05	WEREDA 05	5500.616	1470289.53
80	WEREDA 24	WEREDA 24	45850.89	60364384.81
81	WEREDA 14	WEREDA 14	8622.786	2836804.124
82	WEREDA 02	WEREDA 02	6656.391	1954950.463
83	WEREDA 07	WEREDA 07	7359.97	2021286.838
84	WEREDA 01	WEREDA 01	5564.685	1573135.676
85	WEREDA 13	WEREDA 13	9418.305	3567312.178
86	WEREDA 16	WEREDA 16	15240.92	12372687.86
87	WEREDA 09	WEREDA 09	6895.573	2441839.691
88	WEREDA 25	WEREDA 25	16870.2	11530806.98
89	WEREDA 12	WEREDA 12	18153.18	14240556.11
90	WEREDA 08	WEREDA 08	18245.73	12907794.07
91	WEREDA 10	WEREDA 10	12712.72	9128108.572
92	WEREDA 28	WEREDA 28	56798.13	109888517.5

NO.	W Name	W. Name_(new)	Shape Length	Shape Area(m^2)
93	WEREDA 11	WEREDA 11	18895.95	13691435.04
94	Minjarna Shenkora	Minjarna Shenkora	198007.5	1497841281
95	Fentale	Fentale	155048.5	1200133664
96	Gimbichu	Gimbichu	144290	766500097.3
97	Ejere (Addis Alem)	Ejere (Addis Alem)	128078.4	425854967.1
98	Walmara	Walmara	124872.3	645139979.4
99	Dendi	Dendi	175895.2	917104022.4
100	Awash Fentale	Awash Fentale	161791.3	1041383902
101	Hagere Mariamna Kesem	Hagere Mariamna Kesem	138782.1	764855341.9
102	Berehna Aleltu	Berehna Aleltu	171994.1	999274101.3
103	Berehet	Berehet	140801.8	747518533.2
104	Jeldu	Jeldu	41441.65	75737394.33
105	Mulona Sululta	Sululta	62271.32	72199353.38
106	Kembibit	Kembibit	61533.73	131734328.7
107	Asagirt	Asagirt	144614.4	582077990.9
108	Adda Berga	Adda Berga	41982.51	43553696.93
109	Angolela Tera	Angolela Tera	38584.81	15287486.93
110	Dulecha	Dulecha	179799.4	1260032485
111	Argoba Special	Argoba Special	130659.7	470880855.6
112	Ankober	Ankober	142650.3	780445163.9
113	Debre Berhan Zuria	Debre Berhan Zuria	91778.28	120477594.8
114	Mafud Mezezo & Mojan	Mafud Mezezo & Mojan	154236.7	472850499.6
115	Simurobi Gele'alo	Simurobi Gele'alo	185120.2	1247213093
116	Kewet	Kewet	142556.6	815055723.1
117	Mama Midirna Lalo	Mama Midirna Lalo	59212.67	74141803.33
118	Jile Timuga	Jile Timuga	91214.19	498063756.6
119	Efratana Gidim	Efratana Gidim	124581	498465067.8
120	Gera Midirna Keya Gabriel	Gera Midirna Keya Gabriel	84317.18	81287364.58

NO.	W Name	W. Name_(new)	Shape Length	Shape Area(m^2)
121	Fursi	Fursi	172060.7	1283387603
122	Artuma Fursina	Artuma Fursina	152676.1	1046050866
123	Artuma	Artuma	87760.13	374051133.6
124	Antsokia Gemza	Antsokia Gemza	108197.5	359659997.8
125	Gishe Rabel	Gishe Rabel	58931.86	26174011.88
126	Dawa Chefa	Dawa Chefa	200228.2	1156647636
127	Albuko	Albuko	77240.16	157589642.6
128	Were Ilu	Were Ilu	8559.104	1517557.246
129	Dewe	Dewe	145059.8	1059667239
130	Kombolcha	Kombolcha	8204.681	3164968.968
131	Gewane	Gewane	493451.8	8642164776
132	Dessie	Dessie	18549.28	13926387.08
133	Dessie Zuria	Dessie Zuria	173239.5	476735445.8
134	Telalak	Telalak	175322.8	1390647451
135	Kalu	Kalu	198139.6	833989143.9
136	Tehuledere	Tehuledere	86788.75	309355529.1
137	Kutaber	Kutaber	44934.46	39885430.6
138	Bati	Bati	185788.7	1371592415
139	Tehuledere1	Tehuledere1	56913.4	191269248.9
140	Werebabu	Werebabu	121788.5	677757274.9

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