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ARGENTINA-UNITED NATIONS/78/016 DEVELOPMENT
PROGRAMME: A REMOTE SENSING AGRICULTURE
FORECAST PROGRAMME

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ABSTRACT

Phase one, 1979-1981 period of the ARG/78/016 UNDP/FAO Project "UTILIZACION DE LA TELEDETECCION PARA EVALUACION DE LA PRODUCTIVIDAD AGRICOLA Y EL PERFECCIONAMIENTO DE UN SISTEMA DE PRONOSTICOS DE PRODUCCION AGRICOLA" is dealt in this paper at Level of general description.

Same comments, conclusions and recommendations are carried out including the main flow chart and the physical specific applications area.

The authors belong to the technical staff of the Argentina Comisión Nacional de Investigaciones Espaciales (CNIE).

I. BACKGROUND

Requested by the President of CNIE in 1977 started technical cooperation between Food and Agriculture Organization of the United Nations (FAO) and the Argentina Government, through CNIE and the Remote Sensing Centre (RSC) of FAO.

A draft copy has been written in 1978 under the advise of Dr. Richard A. Weismiller of LARS/PURDUE UNIVERSITY and Mr. R.A. Pache of FAO/RSC.

Finally the Project was approved for implementation by United Nations Development Programme (UNDP), beginning May 1979 for three years, with an assigned budget of US\$ 1.169.740, supported by the government contribution of US\$ 2.785.300 and the Argentina Landsat Ground Station.

The national organizations involved are: CNIE and the Ministerio de Agricultura y Ganaderia de la Nación (MAG) with the Secretaria de Planeamiento as coordinating body.

The programme development had initial difficulties for recruiting a suitable chief technical adviser (CTA), finally Dr. Jane Schubert was recruited as CTA in January 1980 starting the project implementation shortly after, unfortunately she resigned in february 1981 and the finalization of phase 1 was under temporary advise of J.A. Howard chief of FAO/RSC.

II. PURPOSES

The immediate Project objectives were:

1. Training on remote sensing techniques.
2. Purchase of new remote sensing data processing equipment.
3. Development of remote sensing techniques applied to the local agriculture.

III. DESCRIPTION

The work plan was on the basis of the flow chart of figure 1.

A. TRAINING

Fourteen universitaries had training at several educational centers of United States and Canadá.

The main group has been at the Remote Sensing Institute (RSI) of South Dakota State University, others institutions were:

Canadian Agriculture Ministry
United States Department of Agriculture
Canadian Center for Remote Sensing
area of data processing:
Dipix Systems Limited
Digital Equipment Corporation
Optronics International

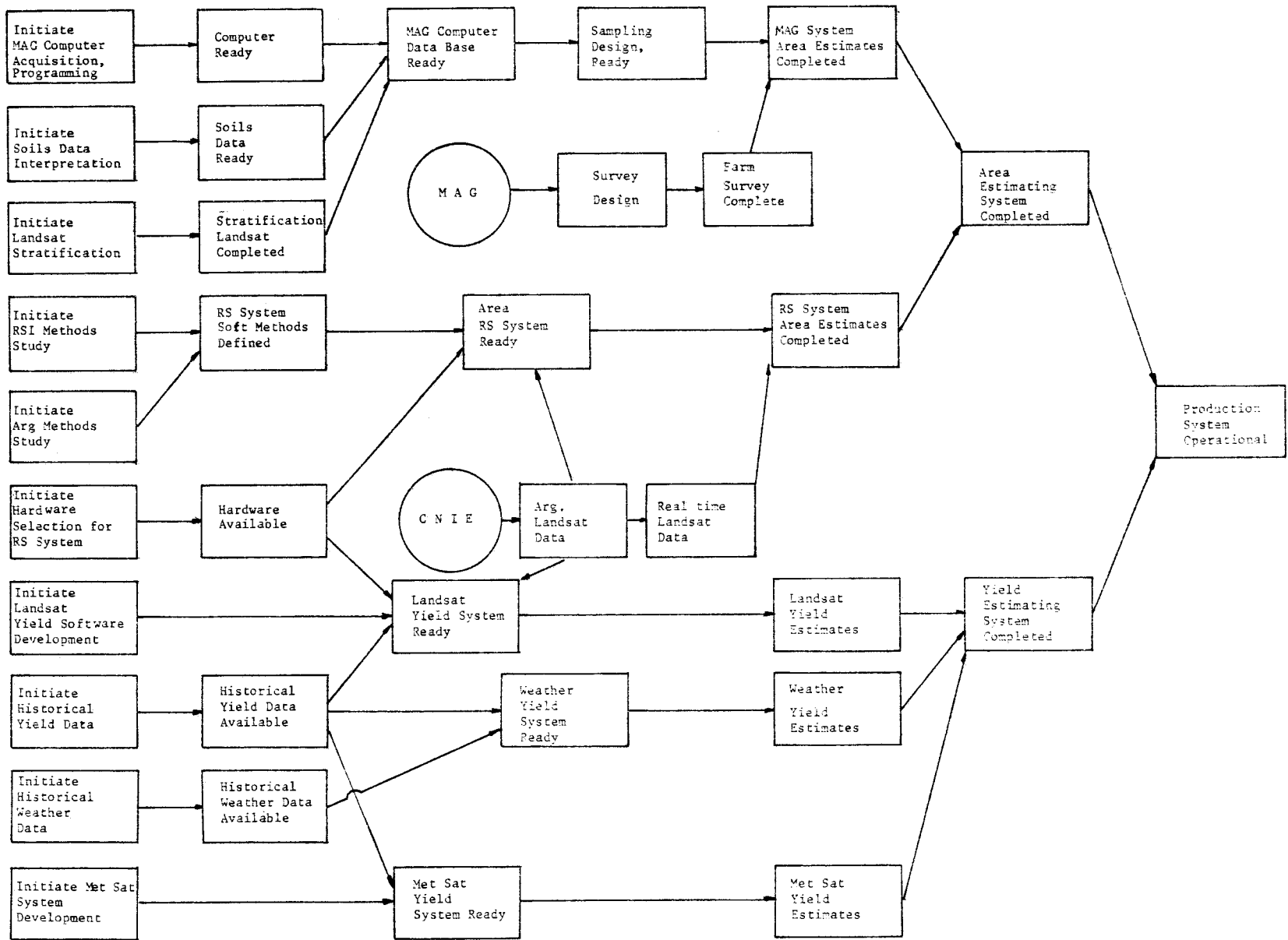


Figure 1

Additional training on site there were from the consultants Clarence Sakamoto (NOAA/EDIS/CEAS) and Albert Van Dyjk (FAO/RSC).

B. EQUIPMENTS

The major components acquired with the project funds were:

1. Color film reader/writer Optronics Colormation C4500 with LSI2 Computer Automation System.
2. LANDSAT Image Analisis System Dipix LCT 11 with PDP 11/34.

3. Computer System NCR model 8270.
4. Trilog Colour matrix printer plotter.
5. Other accesories:
Vehicles, office machines and materials such as color and infrared color aerial film.

C. TECHNIQUES

The project applications area (450.000 Km²), figure 2, was the Pampa Humeda. Three training area were selected there:

1. Pergamino (north)

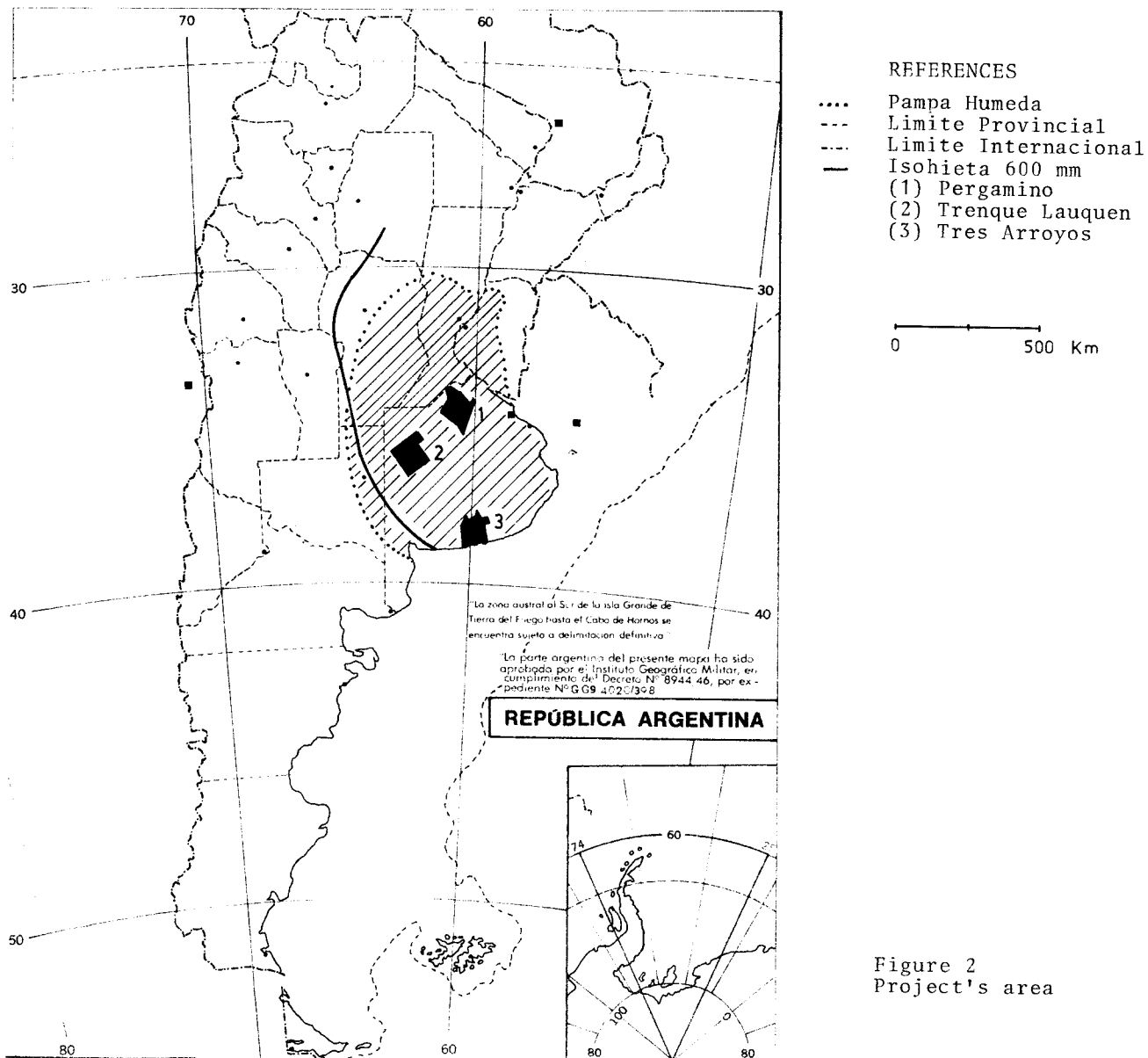


Figure 2
Project's area

2. Trenque Lauquen (west)
3. Tres Arroyos (South)

The base techniques to improve the statistical sample program of MAG for production estimations was the macro and micro regionalization of the area through visual analysis of false color historical LANDSAT images and computer aided classification on training areas.

Complete applied techniques and results were described on six technical reports. Which are:

1. "Estratificación del uso de la tierra en la Pradera Pampeana".
2. "Estratificación en base al uso de tierra y presencia del cultivo trigo en el Sur de la Provincia de Buenos Aires"
3. "Estimación de área cultivada mediante análisis automático de datos LANDSAT".
4. "Diseño de muestreo y relación de los segmentos muestrales en cada dominio a partir de la estratificación del uso de la tierra".
5. "Modelos agroclimáticos para predicción de rendimientos de trigo en la Pradera Pampeana".
6. "Estimación de rendimiento utilizando datos agrometeorológicos e información de satélites meteorológicos".

The inclusion of these reports exceed the level of this paper, but copies of them (only in Spanish) may be requested to the authors.

IV. CONCLUSIONS

Taken into account the programme characteristics and its difficulties, the steps up to this phase may be considered as very successful.

In brief:

1. A first level stratification of Pampa Humeda was done, which is used at MAG as base element for its sample statistics.
2. Specialists of CNIE and MAG had worked jointly, employing very advanced techniques.
3. A collection data system from satellite, aircraft and ground truth worked successfully, visual and machine processing of multis-

pectral data was carried on with good results.

4. At present the general idea is, that in a near future a Remote Sensed Production Estimation System will be operational in our country.

V. REFERENCES

- (1) Handing notes - J.Schubert.
- (2) Back to office Reports - J.A.Howard.
- (3) "Sensores Remotos y el programa de estimaciones agrícolas PNUD/FAO ARG/78/016".
Encuentro Anual de Organizaciones no Gubernamentales /UN-N.Scquizzato.
- (4) "Análisis digital de información LANDSAT aplicada a la agricultura" - F.Redondo, C.Gargantini, G.Vasallo, N.Marlenko.
- (5) "Automatic processing of computer compatible tapes with data from airborne multispectral scanners", Seventh Machine Processing of Remotely Sensed Data Symposium, PURDUE University - N.Scquizzato y S.Pagel.
- (6) Informe preparado para el Gobierno de Argentina por la Organización de las Naciones Unidas para la agricultura y la alimentación en su carácter de organismo ejecutivo del Programa de las Naciones Unidas para el Desarrollo.
- (7) "Desarrollo de software para análisis digital de datos LANDSAT" A.de Quinteros.
- (8) "Evaluación de las características de los suelos condicionantes de la productividad agrícola" E.Lucesole.
- (9) "Estudio y desarrollo de modelos de predicción de rendimientos" - C.Espoz.
- (10) "Guidelines for the selection of an integrated interactive system for remote sensing data processing" 1981 International Geoscience and Remote Sensing Symposium, Washington D.C.-N.Scquizzato
- (11) Handing notes-Engineer Juan J.Tasso.

AUTHORS BIOGRAPHICAL DATA

Sigfredo F.PAGEL was born in Buenos Aires, Argentina. He received the degree in Telecommunication Engineering from the National University of La Plata. He worked in The

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